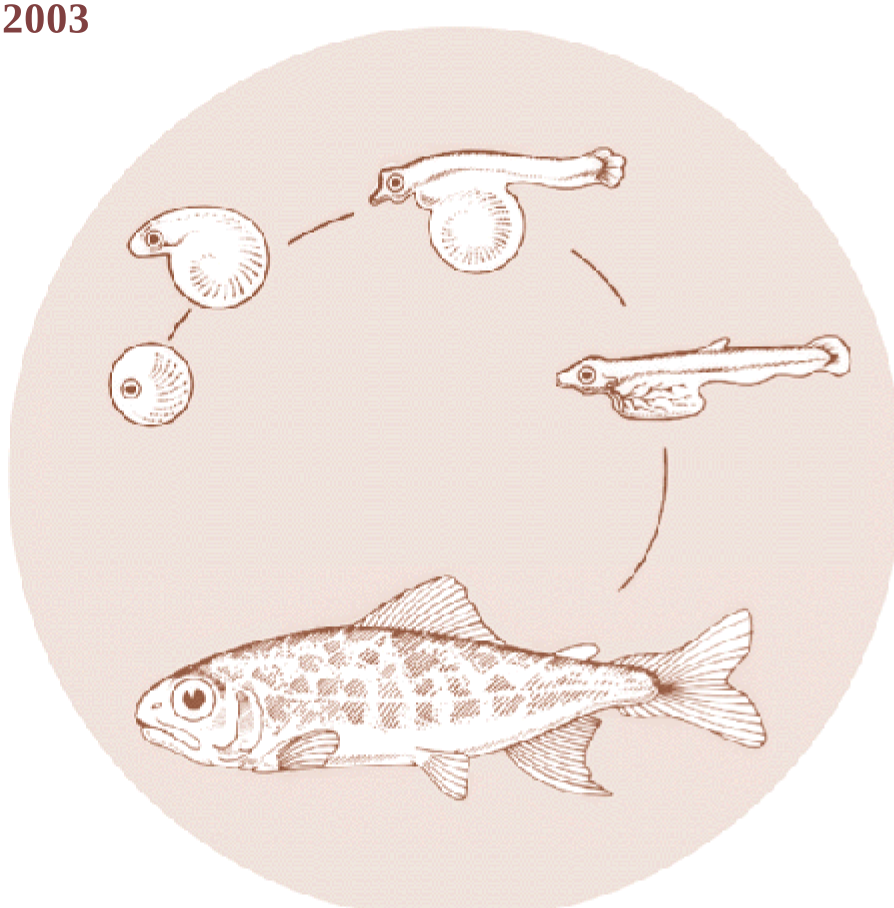
Coeur d'Alene Tribal Production Facility, Volume III of III

Submittal to the Northwest Power Planning Council
Appendices 2

Technical Report
2003



DOE/BP-00006340-4

January 2003

This Document should be cited as follows:

Anders, Paul, John Cussigh, David Smith, Jason Scott, William Towey, Dale Ralston, Ronald Peters, Raymond Beamesderfer, Jeffery Jordan, Ernest Brannon, Douglas Ensor, ''Coeur d'Alene Tribal Production Facility, Volume III of III'', Project No. 1990-04402, 682 electronic pages, (BPA Report DOE/BP-00006340-4)

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This report was funded by the Bonneville Power Administration (BPA), U.S. Department of Energy, as part of BPA's program to protect, mitigate, and enhance fish and wildlife affected by the development and operation of hydroelectric facilities on the Columbia River and its tributaries. The views in this report are the author's and do not necessarily represent the views of BPA.

Table of Contents

1. **Fisheries Habitat Evaluation on Tributaries of the Coeur d'Alene Indian Reservation**, 1993-94 annual report
2. **Coeur d'Alene Tribe Fish, Water, and Wildlife Program, Supplementation Feasibility Report on the Coeur d'Alene Indian Reservation,** 1998 technical report
3. **Fisheries Habitat Evaluation on Tributaries of the Coeur d'Alene Indian Reservation**, 1998 annual report

FISHERIES HABITAT EVALUATION ON TRIBUTARIES OF THE COEUR D'ALENE INDIAN RESERVATION

1993,1994 ANNUAL REPORT

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Project Number. 90-044
Contract Number DE-BI79-90BP 10544

September, 1996

ABSTRACT

Bull trout and cutthroat trout are two salmonid species native to the Lake Coeur d'Alene drainage. Historically these species were a critical component of the Coeur d'Alene Tribe's annual subsistence requirements. Since 1932, the cutthroat trout population has declined significantly in the Coeur d'Alene system. The present ecosystem bears little resemblance to habitat composition, diversity and structure of the historic ecosystem.

The purpose of this study was to conduct baseline stream and biological surveys of four drainages located within the Coeur d'Alene Reservation and make recommendations on ways to increase the westslope cutthroat and bull trout populations on the Reservation.

Data indicated that habitat degradation, specifically, water quantity and lack of habitat complexity, was limiting westslope cutthroat and bull trout populations on the Reservation.

Population data indicated that cutthroat trout populations were low when compared to other similar drainages. Surveys revealed a conspicuous absence of bull trout.

Recommendations included: Conducting extensive habitat restoration in the study drainages; developing alternate harvest opportunities to reduce pressure on wild stocks; purchasing critical watershed areas for fisheries habitat protection; constructing and operating a trout production facility; and, implementing a five-year monitoring program to evaluate the program effectiveness.

ACKNOWLEDGMENTS

The authors gratefully acknowledge the following individuals for their ‘assistance in field data collection and laboratory analysis; Deanna Harper, George Aripa, Richard Allen, A.C. Sanchez, Ron Goddard, Jeff Jordan, Cody SiJohn, David SiJohn, Lyle Meshell, Sam Sanchez. Special thanks to Chris Hardy and David St.Amand, for their technical assistance in field work and in editing the final report. Carla Moore provided secretarial skills for formatting and proofing the final report. Funding was provided by the US. Department of Energy, Bonneville Power Administration, Contract Number 99-044-00. Special thank you goes to Tom Morse (BPA Project Manager), Ernie Stensgar (Chairman, Coeur d’Alene Tribal Council).

TABLE OF CONTENTS

ABSTRACT i
ACKNOWLEDGEMENTS ii
1.0. INTRODUCTION 1
1.1. Fishery Management History of the Coeur d'Alene System 1
1.2. Summary of 1990,1991 & 1992 Findings 1
1.2.1. 1990 1
1.2.2. 1991 2
1.2.3. 1992 3
1.3. Study Objectives 6
2.0. METHODS AND MATERIALS 7
2.1. Description of the Project Area 7
2.2. Physical Investigations 7
2.2.1. Channel Typing 12
2.2.2. Riffle Armor Stability Index 12
2.2.3. Stream Reach Inventory/Channel Stability Evaluation 14
2.2.4. Habitat Evaluations 15
2.25. Stream Discharge Measurements 16
2.2.6. Water Quality Analysis 16
2.3. Fisheries Surveys 16
2.3.1. Relative Abundance 16
2.3.2. Trout Population/ Biomass Estimates 16
2.3.3. Habitat Use Evaluation 18
2.3.4. Spawning Surveys 18
2.35. Migration Trap data 18
2.3.6. Age, Growth and Condition 19
2.4. Macroinvertebrate Surveys 19
2.4.1. Benthic Macroinvertebrate 19
2.4.2. Drift Macroinvertebrate 20
2.4.3. Shannon-Weiner Diversity Index 20
2.5. Analysis of Migration Barriers 21
3.0. RESULTS 23
3.1. Physical Investigations Summary 23
3.1.1. Lake Creek 23
3.1.2. Benewah Creek 35
3.1.3. Evans Creek 56
3.1.4. Alder Creek 68
3.2. Biological Evaluation 82
3.2.1. Relative Abundance 82
3.2.1.1. 1993 Lake, Benewah, Evans, and Alder creeks 82
3.2.1.2. 1994 Lake, Benewah, Evans, and Alder creeks 89
3.2.2. Trout Population and Biomass Estimates by Habitat Type 96

3.2.2.1. Lake Creek 96
3.2.2.2. Benewah Creek 96
3.2.2.3. Evans Creek 100
3.2.2.4. Alder Creek 100
3.2.3. Habitat Use Evaluation 104
3.2.4. Spawning Surveys 105
3.2.5. Trout Migration Analysis 105
3.2.6. Age, Growth and Condition 113
3.2.6.1. 1993 113
3.2.6.2. 1994 120
3.3. Water Quality and Quantity Analysis 128
3.3.1. 1993 128
3.3.2. 1994 135
3.4. Macroinvertebrate Surveys 135
3.4.1. Hess and Drift Samples 135
3.4.2. Biological Assessment 141
3.5. Analysis of Migration Barriers 141
4.0. DISCUSSION 143
4.1. Physical Characteristics 143
4.1.1. Water Quantity and Quality 143
4.1.2. Habitat 144
4.2. Biological Assessment 146
4.3. Conclusion 147
LITERATURE CITED 150
APPENDICES
Appendix A 154
Appendix B 158
Appendix C 161
Appendix D 165
Appendix E 244
Appendix F 254

1.0. Introduction

In 1987 the Northwest Power Planning Council amended the Columbia River Basin Fish and Wildlife Program, directing the Bonneville Power Administration (BPA) to fund "A *baseline stream survey of tributaries located on the Coeur d'Alene Indian Reservation to compile information on improving spawning habitat, rearing habitat, and access to spawning tributaries for bull trout (Salvelinus confluentus) cutthroat trout (Oncorhynchus* clarki), *and to evaluate the existing fish stocks. If justified by the results of the survey, fund the design, construction and operation of* a cutthroat *and bull trout hatchery on the Coeur d'Alene Indian Reservation; necessary habitat improvement projects; and a three year monitoring program to evaluate the effectiveness of the hatchery and habitat improvement projects. If the* baseline survey *indicates a better altemative than construction of a fish hatchery, the Coeur d'A/ene Tribe will submit an* alternative *p/an for consideration in program amendment proceeding.* In 1990, BPA contracted the Coeur d'Alene Tribe to perform this study. This report contains the results of fiscal year 1993 and 1994 data and the Coeur d'Alene Indian Tribes' final recommendations for enhancing the cutthroat and bull trout fishery on the Coeur d'Alene Indian Reservation.

1.1. Fisheries Management History of the Coeur d'Alene System.

See Graves et *a/.* (1990) for a discussion of the past history of the study area.

1.2. Summary of 1990,1991, and 1992 Findings

1.2.1. 1990

Twenty-one creeks, flowing into Lake Coeur d'Alene, and the St. Joe and St. Maries rivers, were initially identified within the study area as having habitat potentially suitable for trout species. Data obtained from an aerial survey further determined that only ten of the original twenty one creeks located within the Coeur d'Alene Indian Reservation contained potential trout habitat (Graves et *al.* 1990). These tributaries included:

Fighting	Plummer
Bellgrove	Benewah
Lake	Hell's Gulch
Squaw	Evans
Little Plummer	Alder

The Missouri method of evaluating stream reaches was modified and used to rank the ten tributaries (Fajen and Wehnes 1981). This ranking, in combination with biological information collected, was used to identify the four streams with the best potential cutthroat and bull trout habitat (Lillengreen, et. al. 1993).

1.2.2. 1991

During 1991, biological data collected on the ten streams included; relative abundance data, trout population estimates, growth rates, and benthic macroinvertebrate densities (Lillengreen, et. al. 1993). Relative abundance data resulted in the capture of 6,138 fish from June, August and October, 1991. A total of 427 cutthroat trout were collected from all sampled tributaries. Relative abundance of cutthroat trout for all tributaries was 6.7 percent. Fighting Creek had the highest relative abundance of cutthroat trout (93.1 percent). Evans Creek, Lake Creek, Hells Gulch, Alder Creek, Benewah Creek, and Plummer/Little Plummer creeks had relative abundances of 30.8, 12.1, 11.1, 3.3, 2.1 and 0.5 percent, respectively. No bull trout were captured in any of the surveyed tributaries. For a complete breakdown of fish relative abundance see Lillengreen, et al. (1993).

Population estimates were conducted in only four of the ten tributaries due to intermittent stream conditions found during the summer on the other six selected streams. The four streams in which population estimates were conducted included Benewah, Alder, Evans and Lake creeks. Density estimates for cutthroat trout were 1.2 fish/100 m^2 in Benewah Creek, 1.5 fish/100 m^2 in Alder Creek, 8.1 fish/100 m^2 in Lake Creek and 18.9 fish/100 m^2 in Evans Creek. Density estimates were also determined for eastern brook trout in Alder Creek (11.8 fish/100 m^2) No bull trout were captured in any surveyed section and are assumed to be absent from the study areas.

Growth rates and condition factors for cutthroat trout captured in each stream tended to be low in comparison to other streams in the region except for Benewah Creek (Lillengreen et *al.* 1993). Growth rates for cutthroat trout existing in Benewah Creek were comparable to other streams in the region. Eastern brook trout growth and condition factors were also comparable to those found in other streams in the region. Bull trout growth rates and condition factors could not be assessed because no bull trout were captured during the study.

Mean annual invertebrate densities in the tributaries ranged from 1,206 organisms/m^2 in Alder Creek to 2,886 organisms/m^2 in Evans Creek. Mean annual densities in the drift ranged from 21 organisms/m^2 in Alder Creek to 266 organism/m^2 in Evans Creek. Invertebrate densities were similar to other streams of the same size in the region For a more detailed breakdown of invertebrate densities, see Lillengreen et *al.* (1993).

Land use practices within each selected watershed have contributed to the degradation of the fishery resources on the Coeur d'Alene Indian Reservation. Major habitat problems associated with the area included high sediment input from non-point sources which included agricultural (grazing and farming) and silvacultural (timber) practices. Stream systems located in low elevation drainages received their primary sources of water from snow melt run-off and rain events. Due to flow constraints (zero flow in summer) and adverse land use practices within the basins, these drainages, have limited potential for resident fish production. However, perennial drainages could have existing land-use practices modified to enhance the habitat quality and quantity for cutthroat and bull trout.

Four out of the ten tributaries, Lake, Benewah, Evans and Alder creeks were chosen for further study based on their relatively high quality fisheries habitat and potential habitat enhancement opportunities.

1.2.3. 1992

During 1992, habitat surveys, fish densities, substrate sampling, migratory patterns, discharge measurements, water quality, and predicted cutthroat trout survival were assessed in Lake, Benewah, Evans and Alder creeks.

To estimate relative species abundance, 1,881 fish were captured in May, July and October, 1992. A total of 349 cutthroat trout were collected from all sampled tributaries. Evans Creek had the highest relative abundance of cutthroat trout at 98.8 percent. Twenty-three percent of the fish collected in Alder Creek were cutthroat trout while 44 percent were eastern brook trout. Benewah and Lake creeks had relative abundance values of five percent and two percent, respectively. For a complete breakdown of fish relative abundance see Lillengreen et *al.* (1993).

Population estimates were conducted in September, 1992. Density estimates for cutthroat trout were 1.4 fish/l 00 m^2 in Benewah Creek, 11.8 fish/l 00 m^2 in Alder Creek, 1.5 fish/l 00m^2 in Lake Creek and 33.0 fish/l 00 m^2 in Evans Creek. Density estimates were also determined for eastern brook trout in Alder Creek with densities of 6.1 fish/l 00 m^2. No bull trout were captured in any surveyed section and were assumed to be absent form the study areas.

Growth rates and condition factors for cutthroat trout captured in each stream tended to be comparable to other streams in north Idaho. Eastern brook trout growth and condition factors were also comparable to those found in other streams in the region. Bull trout growth rates and condition factors could not be assessed since no bull trout were collected in the study area.

Migration trap data in combination with age and growth analyses indicated that Lake and Benewah Creeks had remnant populations of adfluvial westslope cutthroat trout and a resident population of westslope cutthroat trout. Stocks in Alder Creek could not be determined from the data collected and Evans Creek retained only a resident population of cutthroat trout.

Habitat surveys were conducted on each of the four streams. Surveys showed that habitat was a limiting factor for cutthroat and bull trout survival in most of the watersheds.

Lake Creek

Major factors limiting habitat in Lake Cree k were the lack of pool habitat, high water temperatures and cumulative silt loading over time resulting in decreased number of pools and loss of overwintering and rearing habitat. Pools accounted for only eight percent of the total habitat in Lake Creek. Another potentially limiting factor in Lake Creek was the absence of riparian vegetation along most of the stream corridor. Lack of shade from riparian vegetation may be responsible for high summer water temperatures above the acceptable range (>21 "C) for cutthroat trout. High water temperatures create a trout thermal barrier. Substrate sampling indicates that cumulative silt loading over time, has decreased the availability of overwintering and rearing habitat. Average cutthroat trout survival, as estimated from analysis of percent fines is 66 percent.

Benewah Creek

Factors limiting production in Benewah Creek include, lack of riparian vegetation, unstable stream banks, and high siltation rates. Cattle graze 62 per cent of the riparian area, leaving unstable stream banks and little riparian vegetation. Compaction of the soil and removal of vegetation from the riparian zone by cattle grazing, and the amount of cleared uplands due to timber harvesting has increased channel derived sediment into Benewah Creek. Percent fine sediment has contributed to a 16 percent mortality in emergent cutthroat trout fry. The little riparian vegetation that was found in Benewah Creek consisted mainly of shrubs and grasses with an average canopy cover of 3.3 percent.

Trout densities for Benewah Creek were .02 trout/m^2 and .Ol trout/m^2 for 1991 and 1992, respectively. These values are far below other north Idaho c uthroat trout streams showing a similar lack of pristine cutthroat trout habitat.

Base flow below 50 percent of the annual stream flow for optimal trout habitat was partly caused by low snow pack, but also water retention time decreased due to the lack of riparian and upland L letation.

Evans Creek

Evans Creek supports a healthy population of cutthroat trout. Cutthroat trout densities in Evans Creek were high compared to all other streams surveyed and to other north Idaho streams. Densities of .43 $/m^2$ were calculated for 1992. The habitat data collected for Evans Creek is optimal, resulting in these high densities of cutthroat trout. Pools comprise 24 percent of the available habitat in Evans Creek. Heavy overhanging cover (53 percent mean canopy cover) and large organic debris provided sufficient in-stream habitat for westslope cutthroat trout.

Percent emergence success was calculated at 74 percent. This mean is biased based on the low survival rate that was calculated for the lower reach. In the lower reach, one hundred percent of the riparian area had been grazed by cattle. Cattle have destroyed the integrity of the stream bank and increased instream sedimentation . The lower reach of Evans Creek served only as a migratory corridor for cutthroat trout and is not used by the resident cutthroat trout population.

Along with cattle grazing, poor forest practices also contributed to the degradation in Evans Creek. Other areas of concern include future timber sales planned for the areas and the number of instream road crossings present.

Alder Creek

Overall habitat in Alder Creek is sufficient to sustain trout populations. Temperature ranges in Alder Creek are within the acceptable range for cutthroat trout survival, with maximum water temperatures of 19°C and 17°C for 1991 and 1992. Mean canopy cover averaged 34 percent. In Alder Creek, pools accounted for 26 percent of the total available habitat. This is the only stream in the study that contained side channels, with a total of 653 meters which provides lateral habitat for young-of-the-year fish and juvenile rearing. Ninety-one percent cutthroat survival from egg to swim-up fry existed in Alder Creek. Cutthroat trout densities were calculated at $0.12/m^2$ for 1992. Eastern brook trout densities of $.06/m^2$ were calculated in 1992. Cutthroat trout densities were low compared to other cutthroat trout streams in north Idaho, while eastern brook trout densities were comparable to other north Idaho streams.

The presence of eastern brook trout in Alder Creek may also be limiting the westslope cutthroat trout population.

1.3. Study Objectives

The objectives of this study were to:

- Conduct in-depth habitat evaluations of the four primary tributaries which included; estimates of amount of habitat (i.e. pools, riffle, cascades and side channels), estimate of instream and overhang cover; mass wasting (slope failure); bank cutting; vegetative type; and seral stage along stream corridor.
- Determine the population dynamics of trout species present in each tributary.
- Determine habitat utilization
- Determine migratory behavior patterns of trout in each stream in order to assess stocks present (adfluvial, fluvial, or resident).
- Assess age, growth and condition of cutthroat and bull trout.
- Determine extent and effectiveness of cutthroat and bull trout spawning.
- Identify alternatives for restoring cutthroat and bull trout
- Establish biological objectives based on restoration alternatives.
- For each drainage, list habitat improvement opportunities and cost estimates for those improvements.

2.0. Methods and Materials

2.1. Description of the Project Area

The Coeur d'Alene Lake drainage system is located in the Idaho panhandle and extends approximately 9,583 square kilometers. It is divided into two subbasins, including the Coeur d'Alene River basin and the St. Joe River basin. The remainder of the drainage basin consists of streams flowing into Wolf Lodge, Corbin, Windy, Rockford, Mica, and Cougar bays of Lake Coeur d'Alene.

The project area included four tributaries located within the Coeur d'Alene drainage basin: Lake, Benewah, Evans, and Alder creeks.

The Lake Creek watershed (Figure 2.1) is located in southwest Kootenai County, Idaho and southeast Spokane County, Washington. Lake Creek discharges into Lake Coeur d'Alene at Windy Bay. Lake Creek is a third order stream and is approximately 21 kilometers long. Over half of the watershed is forested land while the remainder is agricultural land. Lake Creek is used as a domestic and limited livestock water source.

The Benewah Creek watershed (Figure 2.2) is located in Benewah County, Idaho and is a fourth order stream. Benewah Creek discharges into the southern portion of Benewah Lake, which since the raising of the water levels associated with the Post Falls Dam, is part of Lake Coeur d'Alene. Benewah Creek is approximately 24 kilometers long. Predominant land use practices within the watershed are grazing, timber, and residential uses.

The Evans Creek watershed (Figure 2.3) is located in Kootenai County, Idaho and is a second order stream. Evans Creek discharges into Medicine Lake, a lateral lake associated with the Coeur d'Alene River. Evans Creek is approximately ten kilometers long. Land uses associated with Evans Creek include forestry, grazing, and residential uses. Evans Creek is used as a domestic and livestock water source.

The Alder Creek watershed (Figure 2.4) is located in Benewah County, Idaho and is a fourth order stream. Alder Creek discharges into the St. Maries River and is approximately 20 kilometers long. The major land use practices within the watershed are private/industrial timber production and livestock grazing. Alder Creek is also used as a livestock and limited domestic water source.

2.2. Physical Investigations

Physical investigations were conducted on the four tributaries and included; channel typing, habitat evaluations, riffle armor stability ratings, stream reach channel stability profiles, discharge profiles, and water quality analysis.

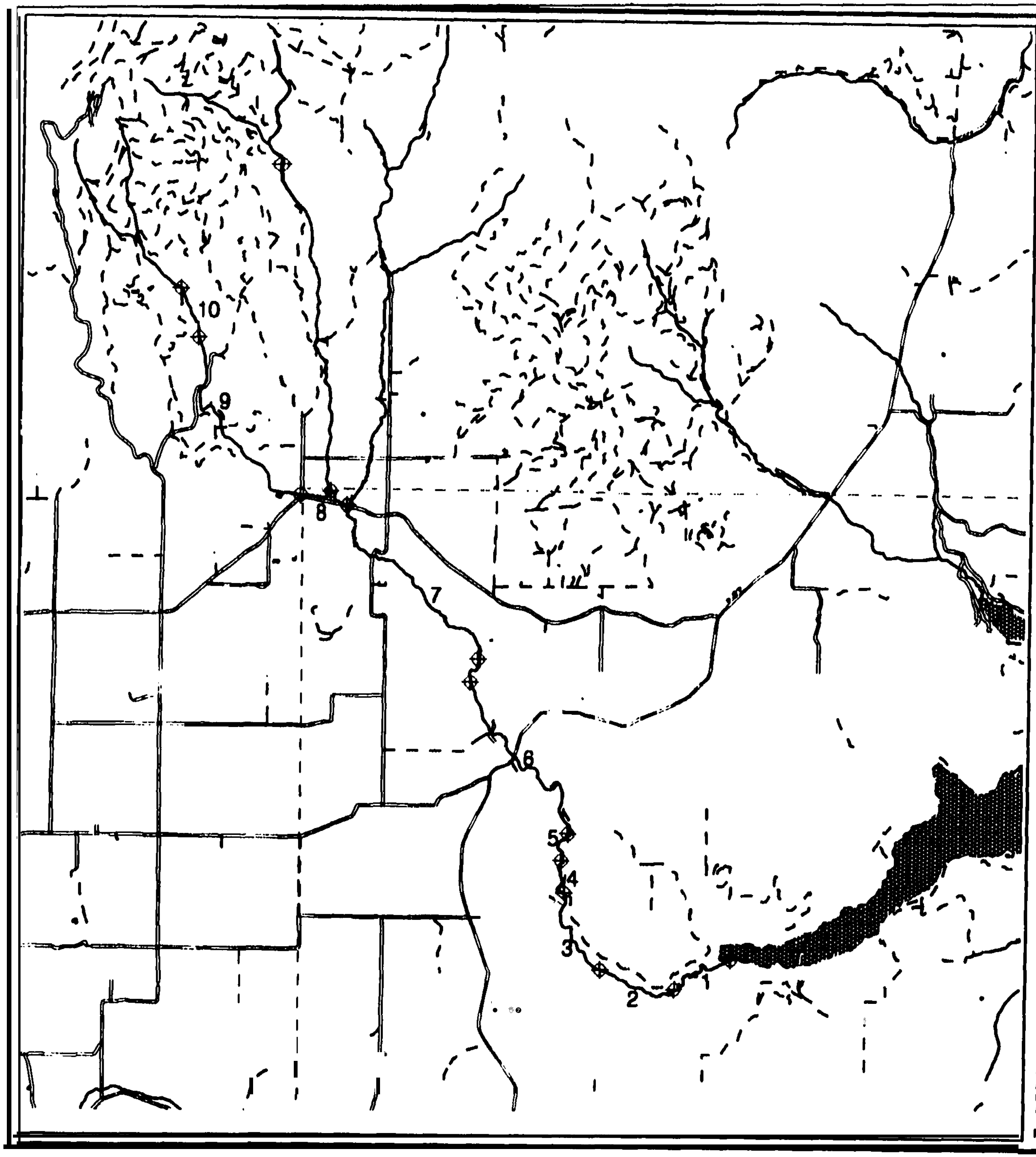


Figure 2.1 Lake Creek Stream Reaches

COEUR D'ALENE TRIBE

Legend

- Stream Reach Break
- Reservation Boundary
- Unimproved Roads
- Secondary Roads
- Primary Roads
- Perennial Streams
- takes

It is important to remember that all maps are interpretations of what is believed to on the ground and that the maps may not always be correct in their interpretation. The base themes for this map came from USGS 1:24000 quadrangle mapes and the accuracy of this map is limited to that scale.

Map produced by the Coeur d'Alene Tribe G.I.S. 9/26/96

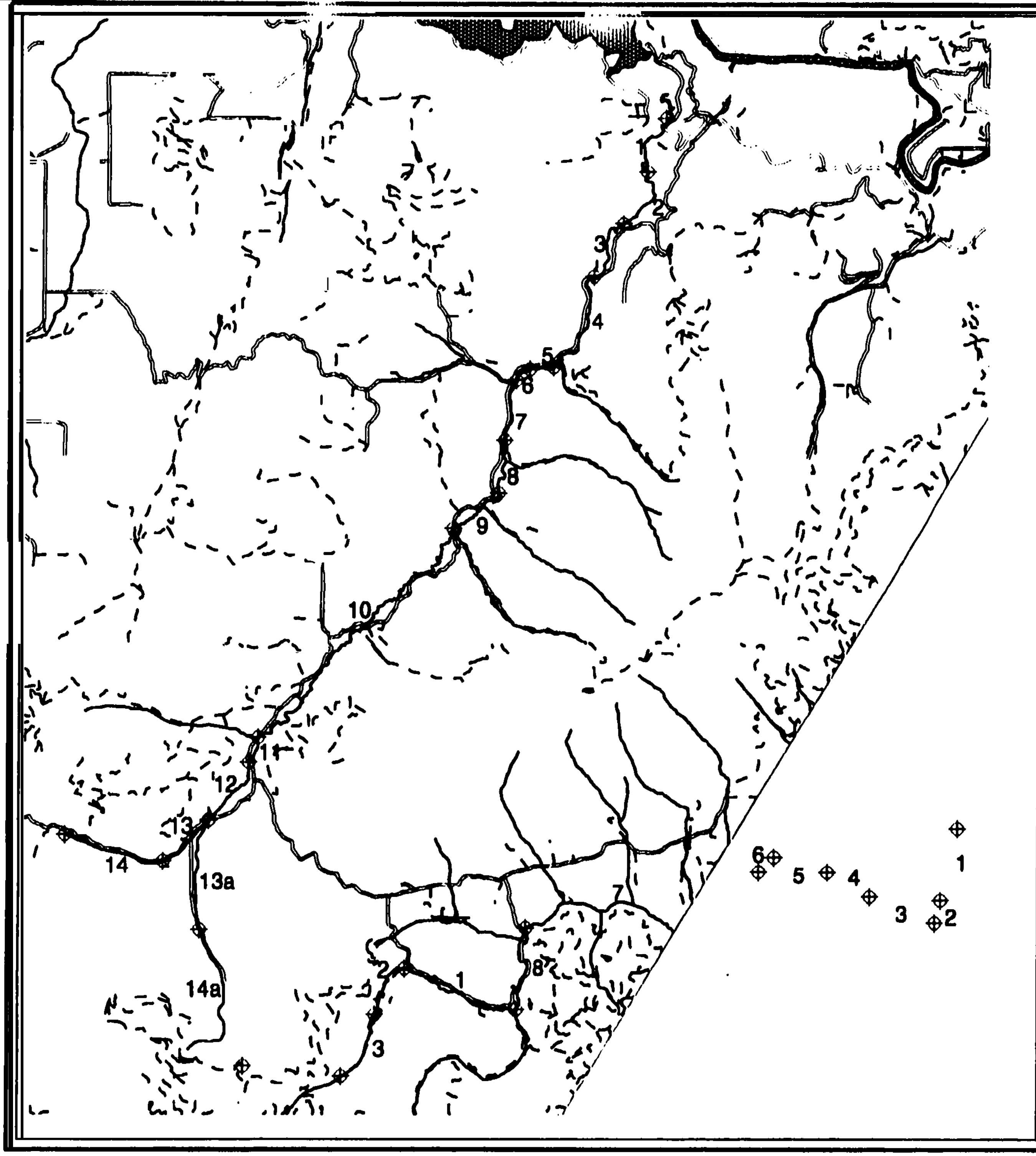
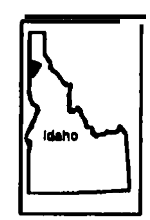


Figure 2.2
Benewah Creek Stream Reaches

Legend

- Stream Reach Break
- Reservation Boundary
- Secondary Paved
- Gravel Roads
- Unimproved Roads
- Perennial Streams
- Rivers
- Lakes



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It is important to remember that all maps are interpretations of what is believed to on the ground and that the maps may not always be correct in their interpretation. The base themes for this map came from USGS 1:24000 quadrangle maps and the accuracy of this map is limited to that scale.

Map produced by the Coeur d'Alene Tribe G I.S. 9/25/96

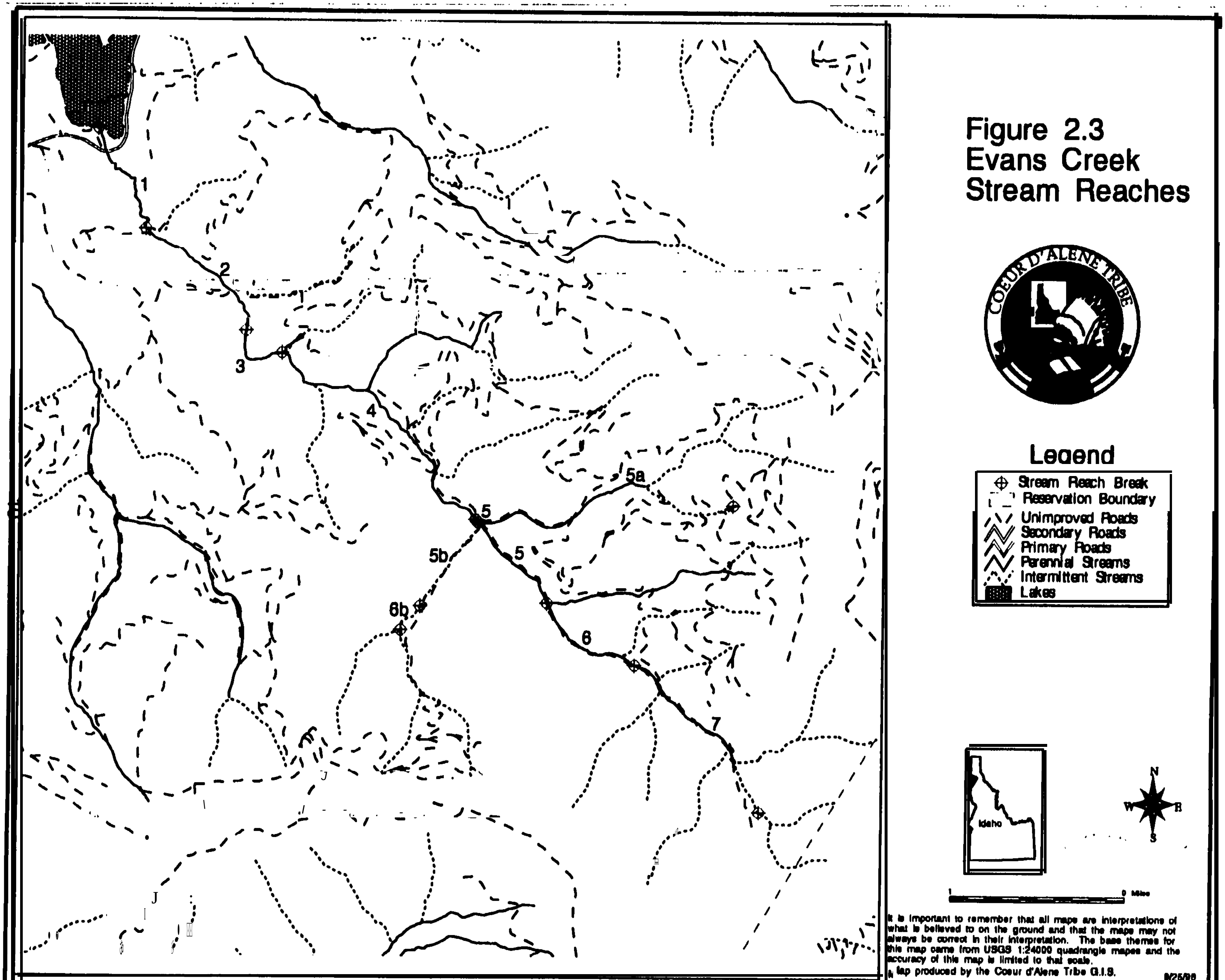

Figure 2.3
Evans Creek
Stream Reaches
COEUR D'ALENE TRIBE
1
2
3
4
5
5a
5b
5
6b
6
7
Legend
Stream Reach Break
Reservation Boundary
Unimproved Roads
Secondary Roads
Primary Roads
Perennial Streams
Intermittent Streams
Lakes
Idaho
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It is important to remember that all maps are interpretations of what is believed to on the ground and that the maps may not always be correct in their interpretation. The base themes for this map came from USGS 1:24000 quadrangle maps and the accuracy of this map is limited to that scale.
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9/25/96

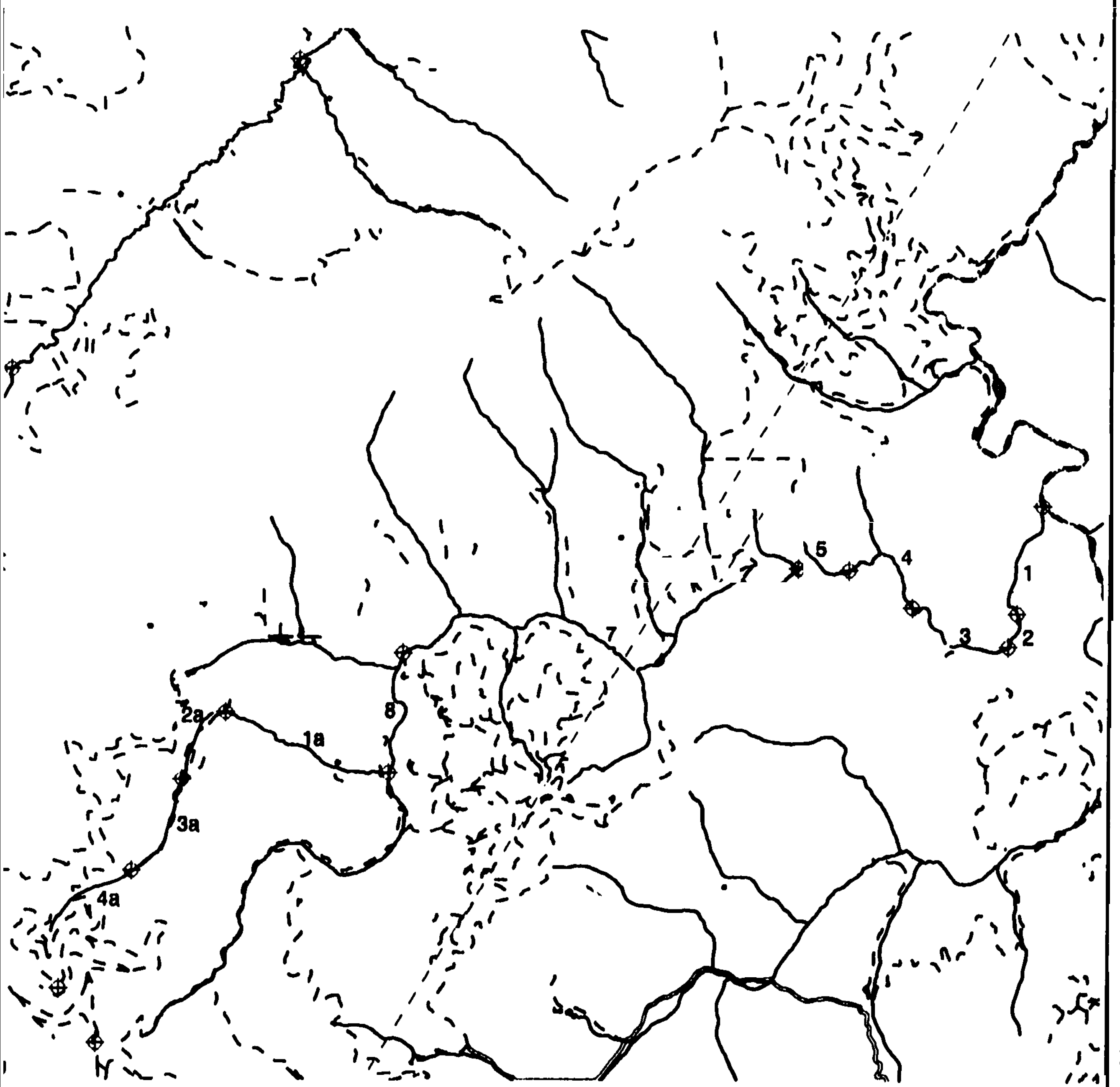
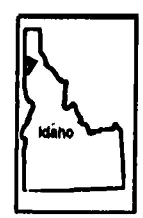


Figure 2.4
Alder Creek Stream Reaches

Legend

- Stream Reach Break
- Reservation Boundary
- Unimproved Roads
- Secondary Roads
- Perennial Streams
- Rivers
- Lakes



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2.2.1. Channel Typing

Channel type surveys were conducted to classify stream reaches into relatively homogeneous types according to broad geomorphological characteristics of stream morphology. Geomorphic parameters were identified and classified according to Rosgen (1991). This type of reach level classification allows for the characterization of channel processes and provides a framework to examine potential channel response, define impact zones for interpreting effects on fisheries habitat, and identify areas best suited for improvement projects.

Surveys were conducted by two person crews beginning at the mouth of streams and working in an upstream direction. Reaches were numbered in ascending order from downstream to upstream. Measured parameters included: bankfull width, bankfull depth, flood-prone width, entrenchment ratio, stream gradient, sinuosity, and dominant substrate. Measurements of bankfull width and depth were determined following visual identification of channel features related to the 1.5 year recurrence interval discharge (Williams 1978). Flood-prone width was extrapolated from a flood-prone depth estimated at two times bankfull depth (Rosgen, 1994). Entrenchment ratio was calculated as the ratio of the width of the flood-prone area to the bankfull width of the channel. Stream gradient was measured to the nearest percent using a handheld clinometer. Sinuosity was determined in the office following examination of aerial photos. Dominant substrate was determined by direct measurement of particle size as described In methods for the Riffle Armor Stability Index (Section 2.2.2). The classification scheme assigns an alphanumeric/numeric code to each stream reach based on measured parameters. Broad stream categories of A-G are assigned based on plan view morphology, entrenchment, width/depth ratio, and sinuosity. The stream types are then broken into discreet slope ranges and dominant channel-material particle sizes. The stream types are given numbers related to the median particle size diameter of channel materials (Figure 2.1). Channel types were determined following 1993 surveys. Measurements were not repeated during the 1994 field season.

2.2.2. Riffle Armor Stability Index

The Riffle Armor Stability Index (Kappesser 1992) provides a quantitative determination of existing channel stability by comparing the size classes of bed material in riffle areas with the largest sizes of material capable of movement at bankfull discharge. The index draws on the principles that stream channel stability is the product of a balance between streamflow and sediment load (Leopold et. al. 1984) and that the composition of a stable riffle is representative of bedload moved at a range of floods (Lisle 1989). Marked differences in the particle size distrioution of riffle areas and the geometric mean particle size on

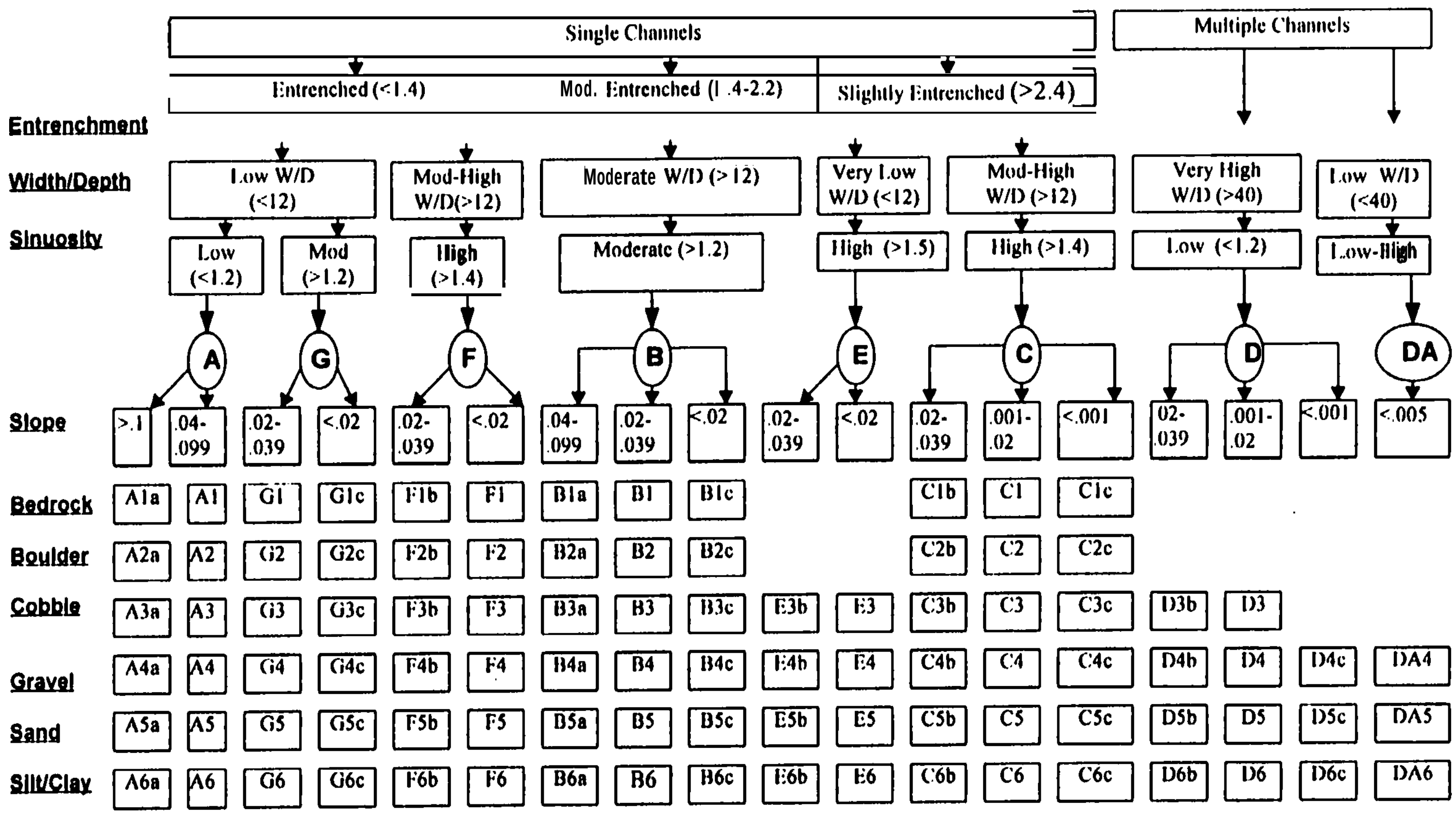

Figure 2.5. Key to channel classification (Rosgen 1994).

fresh depositional areas represents a shift in the equilibrium between streamflow and sediment supply. The index is a useful monitoring tool which provides a record of changes in channel stability over time, and an estimate of the effects of sediment transport on beneficial uses (e.g., filling of pools).

The procedure requires a set of measured field data which includes the particle size distribution of riffle material and a sample from a fresh depositional feature. Particle size distribution was determined (Wolman 1954) at three representative riffles within each of the Rosgen channel types. Sampled riffles were marked with flagging so that measurements could be repeated during 1994 surveys. In instances where channel adjustments significantly altered riffle habitats, measurements were repeated in the riffle area located immediately downstream from 1993 sample locations. Measurements of the largest particles on a fresh depositional feature were collected in close proximity to the riffles examined during each year of the survey. Channel dimensions (e.g., slope, width, depth) were taken in the same area where pebble counts were conducted so that data would be compatible for subsequent analysis. The geometric mean particle size was compared to the cumulative percent of riffle particle sizes to obtain a RASI stability number (Kappesser 1992). The RASI numbers can range from less than 50 to 100, and riffle stability is inversely related to the RASI number.

2.2.3. Stream Reach Inventory/Channel Stability Evaluation

The Stream Reach Inventory/Channel Stability Evaluation (Pfancuch 1975) provides a semi-quantitative assessment of the capacity of a stream to adjust to changes in flow and/or sediment production. The procedure assigns a stability rating of excellent to poor based on the evaluation of fifteen characteristics related to the channel and adjacent floodplain (Table 2.2). Survey crews conducted Stream Reach Inventory/Channel Stability Evaluations for each Rosgen channel type. The scoring for each of the fifteen criteria considered conditions that were representative of the entire reach in question. Scores for each of the criteria were then summed to provide an overall stability rating for the reach. Surveys were repeated during the 1994 sampling effort.

Table 2.2. Evaluating criteria for Stream Reach Inventory/Channel Stability Evaluation surveys.

Landform	Item Rated	Criteria Number
Upper Banks	Landform Slope	1
	Mass Wasting Potential	2
	Debris Jam Potential	3
	Vegetative Bank Protection	4
Lower Banks	Channel Capacity	5
	Bank Rock Content	6
	Obstructions/Flow Deflectors/Sediment Traps	7
	Bank Cutting	8
	Deposition	9
Bottom	Rock Angularity	10
	Substrate Brightness	11
	Substrate Consolidation or Particle Packing	12
	Bottom Size Distribution and Percent Stable Materials	13
	Scouring and Deposition	14
	Clinging Aquatic Vegetation	15

2.2.4. Habitat Evaluations.

Habitat surveys were conducted on primary tributaries during May-October, 1993 and 1994, as described in Lillengreen et. al. (1993) with the following modifications. Stream reaches were delineated based on Rosgen channel typing (Section 2.2.1).-Data was recorded on standardized TFW forms and entered into Microsoft Excel 4.0 software. All parameters analyzed were the same as reported in Lillengreen et. *al.* (1993) with the exception of the incorporation of residual pool depth calculations.

Residual pool depth is the maximum depth of a pool at stage zero discharge. The measurement is recorded as the difference between the thatweg depth at the hydraulic control and the deepest point in the pool. Residual pool depth was calculated following the methods in Lisle (1989) where:

$$RPD = MPD - TCD$$

Where:

MPD = Maximum pool depth
TCD = Tail crest depth

2.2.5. Stream Discharge Measurements

Stream discharge was measured monthly from March 1993 through November 1993, and March 1994 through November 1994, as described in Lillengreen et. al (1993). In March, dishcarge measurements were collected more frequently to measure runoff due to rain-on-snow events. Sampling after the month of March was completed monthly but was event orientated until base flow was established in June. Sampling was then completed the third week of the month during 1993 and 1994.

2.2.6. Water Quality Analysis

Water samples were collected and analyzed monthly and reported as seasonal averages. Spring samples were collected March through May. Summer samples were collected June through August and fa samples were collected September through November. Tests for conductivity, dissolved oxygen, pH. and temperature were conducted in the field using a Hydrolab Surveyor II. Water samples were also collected for laboratory analysis of nitrate, nitrite, phosphates, turbidity, and alkalinity using a LaMotte Chemical colorimetric test kit. Total dissolved solids were determined using a HANNA model 0661-10 dissolved solids tester.

2.3. Fisheries Surveys

2.3.1. Relative Abundance

Tributaries were sampled May through October, excluded September in 1993 and 1994, as described in Lillengreen et al (1993).

2.3.2. Trout Population/Biomass Estimates

Trout populations were estimated in October 1993 using the removal-depletion method (Seber and LeCren 1967, Zippen 1958). Population sites were located within each channel type reach as outlined in Section 2.2.1. Sites within each reach were randomly distributed to include 10 percent of each habitat type present. Block nets were placed at the upstream and downstream boundaries to prevent immigration and emigration. Each section was electrofished using the standard guidelines and procedures described by Reynolds (1983). Fish were collected by spot shocking using a Smith-Root Type VII pulsed-DC backpack electrofisher. A minimum of two electrofishing passes were made for each habitat unit. Captured fish were identified, enumerated, measured (TL to nearest mm), and weighed. Cutthroat trout of 200 mm in length and larger were tagged with a Floy FD-6B numbered anchor tag.

Population estimates were calculated using the following equation (Armor et. al. 1983):

$$N = \frac{(U_1)2}{(U_1-U_2)},$$

Where:

N	=	estimated population size;
u,	=	number of fish collected in the first pass; and,
U_2	=	number of fish collected in the second pass

The standard error of the estimate was calculated as:

$$se(N)=\sqrt{\frac{(U_1)^2(U_2)^2T}{(U_1-U_2)4}}$$

where:

se(N)	=	standard error of the population estimates; and
T	=	total number of fish collected (U_1+U_2)

An approximate 95 percent confidence interval for N (true population size) was calculated as ± 2 x se(N).

The population estimates were converted into density values (# fish/100ft) by habitat type and by reach. The confidence intervals were converted in the same manner. Total standing crop of trout in each of the four drainages was arrived at by calculating the sum of population estimates for individual reaches and habitat types, respectively.

Biomass for cutthroat and eastern brook trout within each sample site was estimated as NW, where W estimates the average weight of all fish of a species that N relates to. Biomass estimates were stratified into juvenile and adult age classes. Juveniles were assumed to be less than 4 years old, while the adult age class consisted of all fish 4 years old and older. Site specific back calculations of lengths at age were used to stratify fish into age classes. Total biomass of trout in each of the four study drainages was arrived at in the same manner as described above for population estimates.

2.3.3. Habitat Use Evaluation

Habitat use in the four study drainages was evaluated through chi-square goodness of fit tests (Daniel, 1990) and comparisons of catch rates by habitat type. Analysis was conducted on 1993 electrofishing data. The null hypothesis tested by the chi-square analysis stated that trout populations do not differ in their relative frequency distribution among habitat types. It was assumed that each habitat type, by definition, constituted a unique set of morphologic and hydrologic characteristics (e.g. substrate size, cover type, average depth, average velocity). Catch rates served as a relative index of habitat selectivity. The assumption was that probability of capture is not biased towards species or habitat type.

2.3.4. Spawning Surveys

Spawning surveys were conducted in late April and early May, 1993 to assess cutthroat trout spawning success. A two member field crew walked from the mouth of the stream to the upper limit of fish habitat in each stream. Redds were located, counted, classified, and marked on topographic maps following procedures described in Lillengreen, et. *al*. (1993).

2.3.5. Migration Trap Data

In March, 1993 and 1994 upstream and downstream migration traps were installed in Lake, Benewah, Evans, and Alder creeks as described in Lillengreen et al (1993). The traps consisted of a weir, runway and a holding box (Figure 2.6). The design was a modification of the juvenile downstream trap found in Conlin and Tuty (1979) (Lillengreen et al. 1993). Traps were installed in pairs to allow monitoring of both upstream and downstream movements of fish (Table 2.35). Paired traps were placed approximately 200 meters apart.

Traps were check twice daily during peak spawning periods from mid-March through the middle of May and once daily afterwards until late June, when traps were removed. Fishes captured in the traps were identified, counted, measured, and weighed. A scale sample was taken to assess the age growth, condition, and stock (fluvial/adfluvial/resident) of the fish.

Table 2.3.5. Location of migration traps, 1994.

Lake Creek	Benewah Creek	Alder Creek	Evans Creek
Lower Trap:	Lower Trae:	Lower Trap:	Lower Trap:
At Hwy 95 crossing	At mouth of Creek	At mouth of creek	At mouth of creek
Upper Trap:	Upper Trap:		
Upstream of con- Ruence with Bozard Creek	Upstream of confluence with SE. Benewah Creek		
Bozard Creek:	S.E. Benewah:		
At mouth of creek	At mouth of creek		
	Coon Creek:		
	At mouth of creek		
	Whitetail Creek:		
	At mouth of creek		

2.3.6. Age, Growth, and Condition

Age growth and condition were determined as described in Lillengreen et al (1993).

2.4. Macroinvertebrate Surveys

2.4.1. Benthic Macroinvertebrates

Benthic macroinvertebrate samples were collected in July, August, and October 1994. Benthic macroinvertebrate densities were collected using the methods of Waters and Knapp (1961). A modified Hess sampler, with an area of 0.1 m^2, and a net aperture of 390 μm, was pushed approximately 10 cm into the substrate at three sites across the width of the stream. Stones found in the area were removed and cleaned of all attached material. The substrate was then disturbed by stirring to obtain any remaining macroinvertebrates. The sample was then preserved in IO percent formalin and transferred to a 70 percent alcohol solution in the lab. Samples were collected in the same areas as the fish collections for feeding habits studies during all three sampling months.

2.4.2. Drift Macroinvertebrates

Two drift samples were collected upstream from fish electroshocking areas in each tributary during each sampling month. Water depth was measured using a wading rod, while velocity measurements were measured directly in front of the sampler at 0.6 of the water depth, using a Price Pygmy current meter (Buchanan and Somers.1 980). These measurements allowed for the calculation of densities of organisms per volume of water passing through the drift. All samples were preserved in the field using IO percent formalin and transferred to a 70 percent alcohol solution in the lab.

2.4.3. Shannon-Weiner Diversity Index

To detemine if a stream was healthy or unhealthy the Shannon-Weiner diversity index We used (Perkins 1982). With this method the number of species as well as the number of individuals within each species are taken into account (Krebs 1985). The lowest value would be obtained when only one species is represented in a stream. The highest value would be obtained when each species is represented by equal numbers of individuals. This equation was:

$$H=-\sum_{i=l}^{s}(Pi)\,(\log_2 Pi)\,,$$

where: H = Index of species diversity;

s = Number of species; and

Pi = Proportion of total sample belonging tc the ith species.

Values above three represent high diversity and normally indicates a healthy unpolluted community. A low diversity of less than two usually indicates an unhealthy and possibly polluted community (Her-ricks and Cairns 1974). Densities and diversities were then compared to other area streams.

2.5. Analysis of Migration Barriers

Survey information collected on culverts and stream channel geometry was used to access culvert velocity barrier potential, jumping distance, and other site characteristics. Culvert diameter, bed slope, length, as well as rust level and pipe condition were noted. Stream channel geometry measurements were taken upstream to assess discharge.

Because length and velocity are the key elements in determining barrier potential, the Mannings equation was solved for velocity as follows:

v = 1.49/n(R)0.67 (sp) 0.5

Where:

v = velocity in FPS (feet per second)

n = Roughness in culverts assumed to be 0.035

R = Hydraulic radius

sp = bed slope

The wetted perimeter is computed for circular pipes by:

P = 1/2@d

and cross section area by:

A = l/8 (@-sin@)d2

The maximum fish speed used in this passage analysis is

VF = VFB(Ffc)

Where:

VFB = Maximum burst speed as found in Bell (1987)

CFC = Coefficient of fish condition

Therefore: VF = (12.48)(.75)

VF for cutthroat trout = 9.36 (Bell, 1964)

Lfs = (VF-VW)TF

Lfs	=	length fish can swim
VF	=	fish speed +9.36
V W	=	Water Velocity
TF	=	Time to fatigue

Passage is analyzed by computing the time it would take the fish to travel the length of the culvert. Time requirement is computed by:

T = U(VF-Vc)

Where:

T	=	Time of passage through culvert,
L	=	length of culvert
vc	=	the velocity through culvert
Vf	=	fish speed

3.0. Results

Physical and biological surveys were conducted on each of the four drainages during 1993 and 1994. Physical surveys conducted on these drainages included, channel typing (Rosgen 1991) channel stability ratings, riffle armor stability index values, habitat evaluations, culvert analysis, stream discharge and water quality analysis. Biological surveys conducted on these drainages included relative abundance estimates, population estimates, biomass estimates. Other information was also derived from the above methods. Specific Information derived from each of the above procedures can be found in Appendices A through D.

3.1. Physical Investigation Summary

3.1.1. Lake Creek

Channel type surveys identified 11 distinct stream reaches in the Lake Creek drainage (Figure 2.1). The mainstem was divided into eight reaches, and three additional reaches were identified on the West Fork of Lake Creek. Physical summaries are given below for mainstem reaches l-7 and for West Fork reaches 8-10. The physical conditions of reaches 9 and 10 are combined in the summary below. Additional habitat information was collected for Bozard Creek and is described below.

Reach one was classified as a C6 channel type and extends for 2,000 feet beginning at the confluence with Windy Bay (Figure 2.1). The reach is a fourth order drainage and encompasses elevations ranging from 2,100 feet to 2,180 feet. This reach is heavily influenced by Coeur d'Alene Lake level fluctuations and has slough-like characteristics. Stream gradient is less than 1 percent and channel pattern is highly sinuous (Table 3.1). Bankfull widths varied from 30-60 feet and bankfull depths vary from 3-5 feet. Channel substrate is comprised mainly of silts. The riparian area is a dense mix of mature coniferous/deciduous trees, grasses and forbs. Channel stability rated fair in 1993 and good in 1994. RASI and habitat surveys were not conducted in this reach because of the slough type nature of the reach. No barriers were observed in this reach.

Reach two extends for 5,093 meters and encompasses elevations ranging from 2,180 feet to 2,260 feet (Figure 2.1). The reach was classified as a C4 channel type (Table 3.2.). Dominant land form in the reach was floodplain with riparian vegetation consisting of a mix of conifers and deciduous trees and shrubs. Average bankfull widths were 29.5 feet and average bankfull depths were 2.7 feet. The channel was slightly entrenched (>2.4) and highly sinuous. (Appendix A).The reach had a riffle/pool ratio of 3: 1 in 1993 and 1.5:1 in 1994.

Table 3.1. Summary table showing values for reach one, Lake Creek, 1993 and l994

PARAMETER	1993	1994
Stream order	4th	
Elevation	2,100-2,180 ft	
Soil type		
Dominant land use	Floodplain	
Riparian ecotype	Coniferous/deciduous mix mature overstory, grass & forbs	
Reach length	2,000 ft	2,000 ft
Channel type	C6	C6
Bankfull width	30-60ft	•
Bankfull depth	3-5ft	•
Width/depth ratio	11.3	*
Mean stream gradient	<l %	
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	fair (113)	good (73)
RASI values	•	•
% substrate < 4mm	*	•
mean substrate size (mm)	•	♦
Mean % canopy cover	0%	•
Barriers	•	
# instream woody debris	•	
Dominant habitat complex	•	
Riffle/pool ratio	•	
Residual pool depth	•	
Total available habitat	•	
Westslope cutthroat trout densitv	•	

Table 3.2. Summary table showing values for reach two, Lake Creek, 1993 and I994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,180-2,260 ft	2,180-2,260 ft
Dominant land use	Floodplain	same
Riparian ecotype	Coniferous/deciduous mix	same
Reach length	5,093 m	6,290 m
Channel type	C4	C4
Bankfull width	29.5 ft	•
Bankfull depth	2.7 ft	•
Width/depth ratio	10.9	•
Mean stream gradient	<1 %	3.6 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	high fair (89)	fair (93)
RASI values	62;78;48	97;88
% substrate < 4mm	10.4	4.5
mean substrate size (mm)	88	141
Mean % canopy cover	11.6 %	46.7 %
Barriers	none	none
# instream woody debris	49 (0.9 /100 m^2)	53 (0.811 00m^2)
Dominant habitat complex	riffle:pool	riffle: pool
Riffle/pool ratio	3.0 : 1	1.5:I
Residual pool depth	0.6 m	0.6 m
Total available habitat	12,797 m^2	28,866 m^2

Mean residual pool depth was 0.6 meters for 1993 and 1994. Channel stability rating for this reach was fair (Table 3.2) with little variation between 1993 and 1994. Channel banks were stable and had good vegetative bank protection, however, bank cutting was observed at meander bends. Some of the channel bottom was affected by scouring and deposition. RASI index values averaged 62.7 in 1993 and 92.4 in 1994, while fine sediment (<4mm) comprised up to 34 percent of the sampled substrate in 1993 and dropped to 6 percent in 1994 (Table 3.2). Dominant habitat complex for this reach was riffle-pool. Instream woody debris remained relatively equal between 1993 and 1994 at 0.9/100 m^2 and 0.8/100 m^2, respectively. Total available habitat increased in 1994 (Table 3.2).

Reach three is 2,088 meters in length with elevations beginning at 2,260 feet and rising to 2,350 feet. (Figure 2.1). The reach was classified as a B3 type channel interspersed with short C segments (Table 3.3). Average stream gradient was 3.5 percent. Consequently, water velocities were slightly higher than in downstream reaches. Average bankfull widths were 35 feet and average bankfull depths were 2.5 feet. Riffle:pool ratio stayed relatively constant between 1993 and 1994 at 1.8:l and residual pool depths averaged 0.5 meters. Very little large woody debris within this reach. Channel stability rating for this reach was fair (Table 3.3). This reach had upland terrace gradients ranging from l0-80 perent with some rock overhangs. Numerous areas of mass wasting were identified in this reach and contributed a relatively large volume of fine sediment. The riparian area consisted mainly of small shrubs, grasses and forbs with interspersed hardwoods. Riparian vegetation provided 18 and 21 percent canopy cover over the stream during 1993 and 1994. Bank cutting was fairly common as a result of lower vigor and density of vegetative material on the lower banks. Very little instream cover was present within this reach. RASI index values averaged 66.5 and 70.1 for 1993 and 1994, respectively. Fine sediment (<4mm) averaged 17.4 and 13.8 percent of the sampled substrate (Table 3.3). The dominant habitat type within this reach was a riffle-pool complex. Total available habitat increased in 1994 (Table 3.3).

Reach four of Lake Creek extends for 1,328 meters with elevations beginning at 2,350 feet and rising to 2,410 feet (Figure 2.1). Dominant land uses included timber harvesting and residential development. The reach was classified as a C3 channel type (Table 3.4). The channel was highly sinuous and width:depth ratio was greater than 23. The channel was only slightly incised and conveyance capacity was inadequate to contain bankfull flows and flood events. Riffle/pool sequences dominated the habitat structure in this reach and riffle/pool ratio was 3:1 in 1993 and 1.6: 1 in 1994. No large organic debris was present in this reach. Channel stability rating was fair for this reach in both 1993

Table 3.3. Summary table showing values for reach three, Lake Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,260-2,350 ft	2,260-2,350 ft
Dominant land use	Floodplain	Floodplain
Riparian ecotype	Coniferous/ Deciduous mix	Coniferous/Deciduous mix
Reach length	2,088 m	4,809 m
Channel type	B3	B3
Bankfull width	35ft	•
Bankfull depth	2.5 ft	*
Width/depth ratio	15.2	*
Mean stream gradient	3 - 4 %	3.5 %
Entrenchment	moderate	moderate
Sinuoisity	moderate	moderate
Channel stability rating	low fair (103)	fair (80)
RASI values	76; 58; 66	80; 78; 52
% substrate < 4mm	17.4 %	13.8 %
mean substrate size (mm)	145	131
Mean % canopy cover	18 %	21 %
Barriers	none	none
# instream woody debris	4 (CO.1 /IO0 m^2)	10 (0.2 /IO0 ft)
Dominant habitat complex	riffle / pool	riffle / pool
Riffle/pool ratio	1.8 :I	2:I
Residual pool depth	0.6 m	0.4 m
Total available habitat	12.555 m^2	341499 m^2

Table 3.4. Summary table showing values for reach four, Lake Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,350-2,410 ft	2,350-2,41 ft
Dominant land use	Forest/urban	Forest/urban
Riparian ecotype	Coniferous/deciduous with pole trees, grassas and forbs	< Coniferous/deciduous mix pole trees, grasses and forbs
Reach length	1,328 m	880 m
Channel type	c3	c3
Bankfull width	50 ft	*
Bankfull depth	2.1 ft	•
Width/depth ratio	23.8	*
Mean stream gradient	2 %	3 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	medium fair (100)	fair (86)
RASI values	78; 67; 73	70; 70
% substrate < 4mm	30.6 %	13.5 %
mean substrate size (mm)	135	141
Mean % canopy cover	0 %	10 %
Barriers	none	none
# instream woody debris	0 (CO.1 /IO0 m^2)	4 (0.2 /IO0 ft)
Dominant habitat complex	riffle / pool	riffle / pool
Riffle/pool ratio	3:l	1.6 : 1
Residual pool depth	0.5 m	0.5 m
Total available habitat	22,186 m^2	19,045 m^2

and 1994 (Table 3.4). Vegetative root mass protection ranged from 70-90 percent. The riparian area was a coniferous/deciduous mix with pole trees, grasses and forbs. Canopy cover averaged O-IO percent for this reach. This reach had significant bank cutting and sloughing and large amounts of fine sediment/gravel depositional areas. Areas of mass wasting were frequently observed and impact potential was judged to be high. Mean RASI values were 72.8 and 69.4 in 1993 and 1994, respectively (Table 3.4). Average fine sediment (4 mm) levels were as high as 31 percent in 1993 but much lower levels were observed in 1994 (13.5 percent). Residual pool depths averaged 0.5 meters for 1993 and 1994. Total available habitat decreased in 1994 (Table *3.4).*

Reach five is a B3 channel type and extends for 525 meters with elevations ranging from 2,410 feet to 2,450 feet (Figure 2.1). The reach is forested with a riparian area consisting of mature coniferous/deciduous trees mingled with grasses and forbs. Average bankfull width was 36 feet with an average bankfull depth of 2.1 feet. Riffle to pool ratio was 3:1, and mean residual pool depth was 0.4 meters in 1993. In 1994, riffle to pool ratio was 8:l with average residual pool depths of 0.5 meters. (Table 3.5). Pool depth was affected by sediment deposition. Mean riparian canopy cover was 19 percent for this reach in 1993 and increased to 26 percent in 1994. Channel stability ratings for this reach were low good (71) in 1993 and fair (101) in 1994 (Table 3.5). There is little mass wasting and bank cutting in this reach. Lower stream banks are armored with dense vegetation- There are moderate amounts of new gravel bars. Average riffle armor stability index values were 48 in 1993 and 73 in 1994 (Table 3.5). Quantities of fine sediment (< 4 mm) averaged 25 and 19 percent in 1993 and 1994, respectively. Total available habitat increased during 1994 (Table 3.5).

Reach six is a 873 meters section with elevations ranging from 2,450 feet to 2,480 feet (Figure 2.1). The reach was classified as a C4-C6 channel type (Table 3.6). Dominant land use is timber harvest with some livestock grazing. The riparian area consisted of a mature mix of coniferous/deciduous trees with grasses and forbs dominating the under-story community. Average bankfull width was 32 feet with an average bankfull depth of *2.1* feet. The channel was slightly entrenched and highly sinuous. Average residual pool depth was 0.7 meters in 1993 and 0.5 meters in 1994. Pool depth was affected by elevated levels of fine sediment (Table 3.6). Channel stability ratings for this reach were fair (101 and 95 in 1993 and 1994, respectively) primarily due to unstable stream banks (Table 3.6). Vegetative bank protection was limited to shallow rooted/seasonal vegetation. There was a significant amount of bank cutting, undercutting and sloughing at outcurves. Accelerated gravel bar development was noted in this reach. RASI index values averaged 73.5 and 81.4 in 1993 and 1994, respectivety. Fine sediment less then 4 mm averaged 48 percent of the sampled

Table 3.5. **Summary table showing values for reach five, Lake Creek, 1993 and 1994**

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,41 O-2,450 ft	2.41 O-2,450 ft
Dominant land use	Forested	Forested
Riparian ecotype	Coniferous/deciduous mix with grasses, forbs and mature trees	Coniferous/deciduous mix grasses, forbs and mature trees
Reach length	525 m	1,189 m
Channel type	B3	B3
Bankfull width	36 ft	*
Bankfull depth	2.1 ft	*
Width/depth ratio	17.1	•
Mean stream gradient	[illegible]	1.5 %
Entrenchment	moderate	moderate
Sinuoisity	moderate	moderate
Channel stability rating	low good (71)	Fair (101)
RASI values	53; 59; 34	70; 83; 67
% substrate < 4mm	25 %	19%
mean substrate size (mm)	113	173
Mean % canopy cover	18.5 %	26 %
Barriers	none	none
# instream woody debris	5 (, 0.1 /100 m^2)	5 (0.1 /IO0 ft)
Dominant habitat complex	riffle / pool	riffle / pool
Riffle/pool ratio	3:I	8:1
Residual pool depth	0.4 m	0.5 m
Total available habitat	8,357 m^2	18,656 m^2

Table 3.6. Summary table showing values for reach six, Lake Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4 th	4th
Elevation	2,450-2,480 ft	2,450-2,480 ft
Soil type		
Dominant land use	Forested/agriculture	Forested/agriculture
Riparian ecotype	Conferous / decidous mix with grasses, forbs and mature trees	Conferous/decidous mix grasses, forbs and mature trees
Reach length	873 m	873 m
Channel type	C4 - C6	C4-C6
Bankfull width	32 ft	•
Bankfull depth	2.1 ft	•
Wrdth/depth ratio	16	*
Mean stream gradient	1 %	1.3 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	medium fair (101)	fair (95)
RASI values	74; 75; 72	81; 78; 85
% substrate < 4mm	48 %	26.5 %
mean substrate size (mm)	110 mm	142 mm
Mean % canopy cover	0 %	26.5 %
Barriers	none	none
# instream woody debris	18 (<.1 /IO0 m^2)	10 (0.12/100 m^2)
Dominant habitat complex	rifle / pool	riffle / ~001
Riffle/pool ratio	3:l	2.1 : 1
Residual pool depth	0.7 m	0.5 m
Total available habitat	51,031 m^2	64,171 m^2

substrate in 1993, and 27 percent in 1994 (Table 3.6).

The lower boundary of reach seven is located at the highway 95 bridge crossing and continues upstream for 5,369 meters (Figure 2.1). Most of this reach is a fourth order drainage, however, the upper 500 meters is a third order drainage. Elevations range from 2,480 feet to 2,600 feet. Reach seven was classified as a E5 channel type and was highly sinuous (Table 3.7). Average bankfull width was 18 feet and average bankfull depth was 2.2 feet. The channel capacity was considered adequate to contain bankfull flows. Dominant land use was agricutture with portions of livestock grazing and forest use. Channel stability was poor to fair (Table 3.7). The riparian area was comprised mainly of shallow rooted/seasonal species and extensive bank cutting and bank sloughing were observed throughout this reach. No instream woody debris were observed in this reach and residual pools depths were declining during 1994 (Table 3.7). The channel bottom was silt covered and in a yearlong state of flux with scouring and depositic occurring frequently. Average Riffle Armor Stability Index values were 89 and in 1993 and 1994, respectively. The highest percentages of fine sediment in the watershed were found in this reach (Table 3.7). Total available habitat increased in 1994 (Table 3.7).

Reach eight of Lake Creek extends up the West Fork of Lake Creek for 3,324 meters beginning at the confluence with the mainstern (Figure 2.1). This reach is a third order drainage with elevations beginning at 2,540 feet and rising to 2,570 feet. Dominant land type in this reach is forested with some agricutture and livestock grazing use occurring. The riparian area is a coniferous/deciduous mix of young and pole size trees with grasses, forbs, shrubs intermixed. The reach was classified as an E5 channel type interspersed with short C5 segments (Table 3.8). Average bankfull width was 16.5 feet and average bankfull depth was 2.5 feet. Channel stability rated poor (129) to fair (102) in 1993 and 1994, respectively. Channel capacity was generally adequate for carrying bankfull flows, howeve- heavy cattle use has degraded portions of the banks creating areas of overflow. There were areas in which flow deflectors caused continuous bank failures and sloughing, resulting in channel migration. RASI surveys were not conducted in this reach due to the extremely mobile nature of the channel substrate. Vegetation provided very little bank protection and the channel bottom was in a constant state of flux as a result of scouring and depositional processes. Very little instream woody debris was present in 1993 or 1994. Riffle to pool ratios were 2.4:1 in 1993 and 1.9:1 in 1994. Continuous bank failures have reduced channel capacity. Available habitat decreased in 19 (Table 3.8).

Reach nine of Lake Creek is a second order drainages which extends for 949 meters (Figure 2.1). Elevations ranged from 2,570 feet to 2,970 feet. Dominant land type was forested. The riparian area consisted mainly of young

Table 3.7. Summary table showing values for reach seven, Lake Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,480-2,600 ft	2,480-2,600 ft
Soil type		
Dominant land use	Agriculture/grazing/forest	Agriculture/grazing/forest
Riparian ecotype	Coniferous/deciduous mix With shrubs, grasses and forbs	Coniferous/deciduous mix with shrubs, grasses, and forbs
Reach length	5,369 m	5,739 m^2
Channel type	E5-E6	E5 - E6
Bankfull width	18ft	•
Bankfull depth	2.2 ft	*
Wrdth/depth ratio	8.1	•
Mean stream gradient	[illegible]	1.5 %
Entrenchment	slight	slight
Sinuoisity	very - high	very - high
Channel stability rating	high poor (118)	fair (79)
RASI values	80.4; 96.1; 90.6	68; 89; 96
mean substrate size (mm)	102	124
Mean % canopy cover	0 %	45.8 %
Barriers	none	none
# instream woody debris	49 (CO.1 /IO0 m2)	172 (0.9 /IO0 ft)
Dominant habitat complex	glide / pool	riffle / pool
Riffle/pool ratio	2.6 : 1	2.3 : 1
Residual pool depth	0.6 m	0.4 m
Total available habitat	49,096 m^2	77,623 m^2

Table 3.8. Summary table showing values for reach eight, (West fork) Lake Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	3rd	3rd
Elevation	2.540-2.570 ft	2540-2.570 ft
Dominant land use	Forested/agriculture/ grazing	Forested/agriculture/ grazing
Riparian ecotype	Coniferous/deciduous mix with grassesiforbs/shrubs/ young timber	Coniferous/deciduous mix with grasses/forbs/hrubs/ young timber
Reach length	3,324 m	3,265 m
Channel type	E5-C5	E5-C5
Bankfull width	16.5 ft	*
Bankfull depth	2.5 ft	*
Width/depth ratio	6.6	•
Mean stream gradient	1 %	1.2 %
Entrenchment	slight	slight
Sinuoisity	very high	very high
Channel stability rating	medium poor (129)	Fair (102)
RASI values	*	•
% substrate < 4mm	•	•
mean substrate size (mm)		•
Mean % canopy cover	0 %	35.4 %
Barriers	none	none
# instream woody debris	28 (0.8 /100 m^2)	20 (0.8/100 m^2)
Dominant habitat complex	riffle/ pool	riffle / pool
Riffle/pool ratio	2.4 : 1	1.9: 1
Residual pool depth	0.3 m	0.5 m
Total available habitat	18,443 m^2	17,003 m^2

coniferous and deciduous trees. The reach was classified as a E6 channel type and the channel was slightly entrenched and highly sinuous (Table 3.9). Average bankfull width was 12 feet and average bankfull depth was 2.6 feet. Dominant habitat type in this reach was a step pool cascade/rapid complex. Residual pool depth was 0.1 meters in 1993 and 0.9 meters in 1994. Large accumulations of woody debris were noted in this reach (Table 3.9). Channel stability was rated as fair in both 1993 and 1994 (Table 3.9). The channel capacity was adequate to contain bankfull flows. Significant bank cutting and sloughing was evident in the lower portion of this reach, while moderate bank cutting was noted in the upper portion. In the lower portion of this reach the channel bottom is silt covered and fluctuates yearlong, however, only minor amounts of channel scour were observed in the upper portion of the reach. Results of 1993 RASI surveys calculated a mean index value of 69 and an average of 22 percent fines for the reach (Table 3.9). Total available habitat increased during 1994 to 14,528 m^2.

Habitat surveys were conducted on 3,888 meters of Bozard Creek. This tributary is a third order drainage with elevation beginning at 2,540 feet and rising to 2,590 feet (Figure 2.1). Dominant land type was forested with some agriculture use occurring. The riparian area consisted of a mix of young coniferous/deciduous trees and shrubs. No channel type surveys were completed for Bozard Creek. The dominant habitat complex in this reach was riffle-glide with a riffle:pool ratio of 12:l. Mean residual pool depth was 0.3 meters (Table 3.10). Some bank cutting was observed intermittently at outcurves and constrictions. New increase in bar formation and some filling of pools contributed to the fair rating. During 1994, upper portions of this reach became subsurface and could not be utilized by fish.

3.1.2. Benewah Creek

Channel typing surveys identified 16 reaches in the Benewah Creek watershed. Reaches 1-14 are located on the mainstem of Benewah Creek, and reaches 13a and 14a comprise the South Fork of Benewah Creek (Figure 2.2). Physical surveys are described below for mainstem reaches l-l 3 and a general description of the South Fork summarizes information related to reaches 13a and 14a.

Reach one of Benewah Creek extends from the confluence of Benewah Lake upstream for approximately one mile. Habitat surveys were conducted only on the upper 487 meters. Due to the slough type nature of the lower portion of reach one (Figure 2.2). There is limited livestock grazing within this reach. Overbank flows are common in this reach. The reach was classified as a C3 channel type. The channel was slightly entrenched with an average bankfull width-depth ratio of 39 feet (Table 3.11). Mean residual pool depth was 0.8

Table 3.9. Summary table showing values for reach nine, (West Fork) Lake Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	2nd	2nd
Elevation	2, 570-2,970 ft	2,570-2,970 ft
Dominant land use	Forested	Forested
Riparian ecotype	Coniferous/deciduous mix with young timber	Coniferous/deciduous mix with young timber
Reach length	949m	2,306 m2
Channel type	E6-B4a	E6-B4a
Bankfull width	12ft	•
Bankfull depth	2.6 ft	•
Width/depth ratio	4.6	•
Mean stream gradient	3 %	3 %
Entrenchment	slight - moderate	slight-moderate
Sinuoisity	moderate - very high	moderate-very high
Channel stability rating	moderate fair (100)	fair (98)
RASI values	63; 79; 66	•
% substrate < 4mm	22	☒
mean substrate size (mm)	66	•
Mean % canopy cover	77 %	41 %
Barriers	none	none
# instream woody debris	119 (12.5 /IO0 m^2)	52 (2.3 /IO0 m^2)
Dominant habitat complex	step-pool cascade/rapids	cascade ; pool
Riffle/pool ratio	NA	1 : 1.7
Residual pool depth	0.1 m	0.9 m
Total available habitat	3,314 m^2	14,528 m^2

Table 3.10. Summary table showing values for Bozard, 1993 and 1994

PARAMETER	1993	1994
Stream order	3rd	3rd
Elevation	2,540-2,590 ft	2,540-2,590 ft
Dominant land use	Forested / Agriculture	Forested/Agriculture
Riparian ecotype	Coniferous/deciduous mix shrub/young timber	Coniferous/deciduous mix shrub/young timber
Reach length	3,888 m	3,870 m
Channel type	E5	E5
Bankfull width	•	•
Bankfull depth	•	*
Width/depth ratio		•
Mean stream gradient	[illegible]	[illegible]
Entrenchment	slight-moderate	slight-moderate
Sinuoisity	moderate-very high	moderate-very high
Channel stability rating	poor (119)	poor (117)
RASI values	•	•
% substrate < 4mm	•	[illegible]
mean substrate size (mm)	1	•
Mean % canopy cover	0.0%	0.0%
Barriers	none	subsurface flow
# instream woody debris	0 (O/100 m^2)	0 (O/100 m^2)
Dominant habitat complex	riffle - glide	ND
Riffle/pool ratio	12: 1	ND
Residual pool depth	0.3 m	0.0
Total available habitat	25,757 m2	0.0 m^2

Table 3.11. Summary table showing values for reach one, Benewah Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,250-2,250 ft.	2.250-2.250 ft
Dominant land use	Wetland/ftoodplain	Wetland/floodplain
Riparian ecotype	Coniferous/Deciduous shrubs	Coniferous/Deciduous shrubs
Reach length	471 m	487 m
Channel type	c3	C3a
Bankfull width	158ft	•
Bankfull depth	4.0 ft	•
Width/depth ratio	39 ft	
Mean stream gradient	1.5 %	1 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	medium fair (94)	high fair (83)
RASI values	80; 69; 82	90; 69; 87
% substrate < 4mm	12	21.5
mean substrate size (mm)	133	152
Mean % canopy cover	0.0 %	29.4 %
Barriers	none	none
# instream woody debris	8 (O/100 m^2)	15 (0.4 / 100 m^2)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	2:l	2 :l
Residual pool depth	0.8 m	0.7 m
Total available habitat	25,223 m^2	3,336 m^2

meters and riffle:pool ratio was 2:l. Channel stability was rated as fair in this reach (Table 3.11). Lower banks had significant cuts (up to 2 feet high) and root mat overhangs and bank sloughing was evident. No instream woody debris was evident in this reach. Mean RASI values were 77 and 82 for 1993 and 1994, respectively (Table 3.11). Mean fine sediment values were 12 and 22 percent of sampled substrate, for 1993 and 1994, respectively. Total available habitat decreased during 1994 (Table 3.11).

Reach two of Benewah Creek extends for 1,342 meters and encompasses elevations ranging from 2,250-2,330 feet (Figure 2.2). This reach is forested and dominated by large shrubs. The reach was classified as a B2a channel type (Table 3.12). Channel capacity was adequate for existing flow conditions with the channel being moderately entrenched. Average stream gradient was 4 percent with the dominant habitat complex consisting of step-pools and riffles. A riffle to pool ratio of 4:l was calculated for this reach and average residual pool depth was 0.4 meters in 1993, and 7: 1 and 0.4 meters in 1994 (Table 3.12). Channel stability rated good for both 1993 and 1994 (Table 3.12). Bank protection was adequate with both shallow and deep rooted species providing stability. Debris jam potential was minor. Lower banks were well armored with approximately 70 percent of the lower banks protected by large boulders. Very little cutting or deposition occurred in this reach. Seasonal blooms of aquatic vegetation were observed. The mean RASI index value was 43 and fine sediment (c 4 mm) comprised less than 15 percent of the sampled substrate (Table 3.12). Total available habitat declined in 1994 (Table 3.12).

Reach three was classified as a C2b channel type and extends for 724 meters (Figure 2.2). This reach was mostly forested with large shrubs dominating the riparian zone. Mean stream gradient was 2 percent. Average stream canopy cover was 29 percent in 1993 and 40 percent in 1994. The dominant habitat complex in this reach was riffle-pool with a riffle pool ratio of 1.3:1 in 1993 and 2.5:1 in 1994. Average residual pool depths of 0.7 meters (1993) and 0.4 meters (1994) were calculated (Table 3.13). Channel stability was considered good (Table 3.13). Upper bank slopes ranged from 3 to 60 percent and intermittent areas of mass wasting and unstable slopes were observed. Bank protection was comprised mainly of shallow rooted species. There was evidence that channel capacity was not adequate to contain bankfull flows. Lower banks were comprised of cobble and boulder while bank cutting occured at outcurves with new coarse gravel bar development. The channel bottom was firmly embedded, with less than five percent of the bottom affected by scouring and deposition. No instream woody debris was located in this reach. Seasonal alga blooms were observed. Mean RASI values were 51 and 44 during 1993 and 1994, respectively. Fine sediment (< 4 mm) generally comprised less than 10 percent of sampled substrate (Table 3.13). Total available habitat declined in 1994 (Table 3.13).

Table 3.12. Summary table showing values for reach two, Benewah Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,250-2,330 ft	2,250-2,330 ft
Dominant : d use	forested	forested
Riparian ecotype	Coniferous/ Deciduous	Coniferous/Deciduous
Reach length	1,342 m	1,415 m
Channel type	B2a	B2a
Bankfull width	35ft	•
Bankfull depth	2.7 ft	*
Width/depth ratio	13	
Mean stream gradient	4 %	[illegible]
Entrenchment	moderate	moderate
Sinuoisity	moderate	moderate
Channel stability rating	good (74	good (80)
RASI values	*	24.1 ; 67.1 ; 38.9
% substrate < 4mm	•	10.6 %
mean substrate size (mm)	•	109
Mean % canopy cover	80 %	37 %
Barriers	none	none
# instream woody debris	5 (O/100 m^2)	6 (O/100 m^2)
Dominant habitat complex	riffle - step pool	riffle - step pool
Riffle/pool ratio	4:l	7:l
Residual pool depth	0.4 m	0.4 m
Total available habitat	51,063 m^2	20,357 m^2

Table 3.13. Summary table showing values for reach three, Benewah Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,330-2,330 ft	2,330-2,330 ft
Dominant land use	forested	forested
Riparian ecotype	Coniferous/ Deciduous	Coniferous/Deciduous
Reach length	724 m	1,154 m
Channel type	C2b	C2b
Bankfull width	41 ft	*
Bankfull depth	2.7ft	•
Width/depth ratio	15	15
Mean stream gradient	2 %	2 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	low good (67)	medium good (55)
RASI values	52; 45; 56	3; 43; 87
% substrate < 4mm	8 %	6.2 %
mean substrate size (mm)	140	141
Mean % canopy cover	29 %	40 %
Barriers	none	none
# instream woody debris	3 (O/100 m^2)	1 (O/100 m^2)
Dominant habitat complex	riffle-pool	riffle-pool
Riffle/pool ratio	1.3: 1	2.5 : 1
Residual pool depth	0.7 m	0.4 m
Total available habitat	29,541 m^2	22,856 m^2

Reach four extends for 1,349 meters with elevations ranging from 2,330 to 2,380 feet (Figure 2.2). The reach is a B3c channel type with moderate entrenchment and moderate sinuosity (Table 3.14). Dominant land type in the reach was forested with large deciduous shrubs forming the dominant riparian cover. This reach has been heavily influenced by past rain-on-snow events. Average stream gradient was 1.5 percent. Riffle/pool ratio was 1 :l in 1993 and 2:l in 1994. Residual pool depth increased from 0.3 meters in 1993 to 0.7 meters in 1994 (Table 3.14). Channel stability rated from good to fair (Table 3.14). Overbank flows were common throughout the reach. There was no evidence of mass wasting problems, and lower bank cutting was limited to outcurve areas. There was little new bar development in this reach. The channel bottom was firmly embedded, with little scouring and deposition occuring in this reach. Seasonal alga blooms were present. Average RASI values were 46 in 1993. RASI values were considerably higher in 1994 (mean = 81). Fine sediment (< 4 mm) comprised less than 13 percent of the sampled substrate in both 1993 and 1994 (Table 3.14). Total available habitat increased in 1994 (Table 3.14).

Reach five was classified as a Cl b channel type and extends for 1,056 meters (Figure 2.2). Elevations in the reach began at 2,380 feet and rose to 2,490 feet. This reach contained a small bedrock falls which was not considered a migration barrier. This reach was forested with riparian vegetation dominated by large deciduous shrubs. Average stream gradient was 4.5 percent. Riffle to pool ratio Was 1.5:1 and mean residual pool depth was 0.2 meters in 1993 and 0.6 meters in 1994. Channel stability in this reach was good (Table 3.15). Landform slope ranged from 2 to 40 percent with no evidence of mass wasting problems. Occasional overbank flows have occurred in the past. The channel area was free of debris jam materials. The lower banks were composed mainly of mostly boulder which minimized bank cutting and erosional problems. Channel substrate was predominantly bedrock with no instream woody debris. Clinging aquatic vegetation was common with both algae and moss present in pools and swifter waters. No RASI surveys were conducted in this reach because of the bedrock substrate. Total available habitat increased in 1994 (Table 3.15).

Reach six extends for 835 meters with elevations ranging from 2,490 to 2,550 feet (Figure 2.2). This reach was dominanted by small shrubs, grass and forbs and was actively utilized by livestock. The reach was classified as a C3 channel type (Table 3.16). Average stream gradient was 1 percent, the channel was slightly entrenched, and sinuosity was high. Riparian vegetation provided no canopy cover and no instream woody debris was present. Dominant habitat complex was riffle/pool with a riffle pool ratio of 1.5:1. Mean residual pool depth was 0.2 meters in 1993 and 0.6 meters in 1994 (Table 3.16). Upper banks

Table 3.14. Summary table showing values for reach four, Benewah Creek, 1993 and 1994

P	1993	1994
Stream order	4th	4th
Elevation	2,330-2,380 ft	2,330-2,380 ft
Dominant land use	forested	forested
Riparian ecotype	Coniferous/Deciduous mix with large shrubs	Coniferous/Deciduous with large shrubs
Reach length	1,349 m	1,728 m.
Channel type	B3c	B3c
Bankfull width	55ft	*
Bankfull depth	2 .Oft	*
Width/depth ratio	27.5	27.5
Mean stream gradient	1.5 %	2 %
Entrenchment	moderate	moderate
Sinuoisity	moderate	moderate
Channel stability rating	medium good (60)	high fair (78)
RASI values	38; 53; 46	82; 79; 83
% substrate < 4mm	6	11.7
mean substrate size (mm)	108	111
Mean % canopy cover		17.7 %
Barriers	none	none
# instream woody debris	3 (O/100 m^2)	3 (O/100 m^2)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	1:l	2:l
Residual pool depth	0.3 m	0.7 m
Total available habitat	32,275 m^2	44,093 m^2

Table 3.15. Summary table showing values for reach five, Benewah Creek, 1993 and 1994

PRAMETER	1993	1994
Stream order	4th	4th
Elevation	2,380-2,490 ft	2,380-2,490 ft
Dominant land use	forested	forested
Riparian ecotype	Coniferous/Deciduous mix with large srubs	Coniferous/Deciduous mix with large schrubs
Reach length	1,056 m	1,244 m
Channel type	Clb	Clb
Bankfull width	[illegible]	•
Bankfull depth	[illegible]	•
Width/depth ratio	21.3	21.3
Mean stream gradient	3 %	2 %
Ent; enchment	slight	slight
Sinuoisity	high	high
Channel stability rating	high good (48)	high good (48)
RASI values	NA	NA
% substrate < 4mm	NA	NA
mean substrate size (mm)	NA	NA
Mean % canopy cover	ND	16.8 %
Barriers	none	none
# instream woody debris	0 (O/l 00 m^2)	3 (O/100 m^2)
Dominant habitat complex	riffle - pool	riffle - step pool
Riffle/pool ratio	3:l	l : o
Residual pool depth	0.2 m	0.6 m
Total available habitat	30,956 m^2	29,156 m^2

Table 3.16. **Summary table showing values for reach six, Benewah Creek, 1993 and 1994**

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,490-2,550 ft	2,490-2,550 ft
Dominant land use	Livestock grazing	Livestock grazing
Riparian ecotype	Coniferous/deciduous mix with small shrub, grasses, & forbs	Conferous/decidous mix small shrub/grasses/forbs
Reach length	835 m	797 m
Channel type	c 3	c 3
Bankfull width	38 ft	*
Bankfull depth	1.9 ft	•
Width/depth ratio	20	20
Mean stream gradient	1 %	1.5 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	low good (65)	medium good (59)
RASI values	45; 43; 62	67; 29; 86
% substrate < 4mm	11	13.7
mean substrate size (mm)	82	133
Mean % canopy cover	•	3 %
Barriers	none	none
# instream woody debris	0 (0/100 m^2)	0 (0/100 m^2)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	1.5: 1	3 : 1
Residual pool depth	0.2 m	0.6 m
Total available habitat	6.995 m^2	12,694 m^2

showed evidence of past mass wasting problems. The potential for future mass wasting problems was high, due to a lack of dense, deep rooted plant species on steeper slopes. Lower banks consisted of cobbles and boulders. Some intermittent bank cutting was observed at outcurves and new gravel bar formation was evident. The channel bottom was stable and comprised of tightly packed, well distributed particle sizes. An estimated 5 to 30 percent of the channel bottom was affected by scouring and deposition. Clinging aquatic vegetation was common throughout the reach with both seasonal algae blooms and moss in pools and swifter waters. Mean RASI values were 50 and 60 in 1993 and 1994, respectively (Table 3.16). Fine sediment (< 4 mm) comprised less than 11 percent of the sampled substrate on average for both 1993 and 1994. Total available habitat increased during 1994.

Reach seven of Benewah Creek is a C3 channel type which is 3,193 meters in length. Elevations range from 2,550 to 2,560 feet (Figure 2.2). Dominant land use was livestock grazing. Riparian areas were dominated by large shrubs which provided an average canopy cover of 45 percent. Dominant habitat complex was riffle/pool with a riffle:pool ratio of 1.2: 1 in 1993 and a riffle to pool ratio of 3.1 :1 in 1994. Mean residual pool depth was 0.7 meters. Average stream gradient was 1 percent (Table 3.17). Channel stability was rated as fair (Table 3.17). Landform slope ranged from 0 to 3 percent. There were some areas where upper bank failure had occurred. Lower banks consisted of 65 percent cobble and small boulder, with bank cutting occurring at obstructions and outcurves. The lower banks barely contained existing peak flows. Recent deposition of gravel and sand sized substrate was noted throughout the reach. The channel bottom was fairly stable with 5-30 percent of the channel bottom affected by scouring and deposition. Seasonal algal blooms were observed. Mean RASI values were 44 and 78 in 1993 and 1994, respectively (Table 3.17). Fine sediment comprised an average of 13 and 16 percent of the sampled substrate in 1993 and 1994, respectively.

Reach eight is a C6 channel type which extends for 2,753 meters and encompasses elevations ranging from 2,560 feet to 2,640 feet (Figure 4.2). The channel is slightly entrenched and highly sinuous. Mean stream gradient was 1 percent (Table 3.18). Dominant land use is livestock grazing and riparian areas are vegetated with a mix of shrubs, grasses and forbs. Average canopy cover in this reach was 21 percent with instream wood densities of less than $0.1/m^2$. The dominant habitat complex was riffle/pool with a mean residual pool depth of 1 .O meters Table 3.18). Channel stability in this reach was fair to good (Table 3.18). Overbank flows were common throughout the reach. There were continous cuts along both lower banks, and some deposition of gravel and sand on old and some new bars. Scouring and deposition affected 5 to 30 percent of the channel bottom. Seasonal algal blooms made rocks slick, and moss was present in swifter waters. RASI values were variable with mean values increasing from 49 to 72 during the one year sample interval (Table 3.18). Measured fine sediment

Table 3.17. Summary table showing values for reach seven, Benewah Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,550-2,560 ft	2,550-2,560 ft
Dominant land use	Livestock grazing	Livestock grazing
Riparian ecotype	Coniferous/deciduous mix with large shrubs	Coniferous/deciduous mix with large shrubs
Reach length	3,193 m	3,685 m
Channel type	c 3	c 3
Bankfull width	44 ft	•
Bankfull depth	2 .5 ft	⊠
Width/depth ratio	17.6	17.6
Mean stream gradient	1.4 %	1.2 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	high fair (77)	medium fair (96)
RASI values	60; 27; 45	72; 70; 93
% substrate < 4mm	13	15.5
mean substrate size (mm)	116	109
Mean % canopy cover	49 %	43 %
Barriers	none	none
# instream woody debris	1 (0/100 m^2)	19 (0.01 /100 m^2)
Dominant habitat complex	riffle-pool	riffle-pool
Riffle/pool ratio	1.2 : 1	3.1 : 1
Residual pool depth	0.7 m	0.8 m
Total available habitat	53,556 m^2	54,177 m^2

Table 3.18. Summary table showing values for reach eight, Benewah Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,560-2,640 ft	2,560-2,640 ft
Dominant land use	Livestock grazing	Livestock grazing
Riparian ecotype	Coniferous/deciduous mix with shrubs, grasses, & forbs	Coniferous/deciduous mix with shrubs/grasses/forbs
Reach length	2,753 m	2,796 m
Channel type	C6	C6
Bankfull width	42 ft	*
Bankfull depth	1.6 ft	•
Width/depth ratio	26.2	26.2
Mean stream gradient	1.8 %	1.8 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	high fair (82)	low good (73)
RASI values	42; 33; 72	70.5; 76.2; 68.9
, % substrate < 4mm	8 %	14.7 %
mean substrate size (mm)	108	137
Mean % canopy cover	21.4 %	26.1 %
Barriers	none	none
# instream woody debris	24 (0/100 m^2)	6 (0/100 m^2)
Dominant habitat complex	riffle- pool	riffle- pool
Riffle/pool ratio	1.3 :1	2 : 1
Residual pool depth	1.0 m	0.8 m
Total available habitat	35,793 m^2	32,007 m^2

increased from a mean of 8 percent in 1993 to 15 percent in 1994. Total available habitat decreased in 1994 (Table 3.18).

Reach nine was classified as a C5 channel type and extends for 1,032 meters (Figure 2.2). Dominant land use in the reach was livestock grazing and riparian areas were primarily vegetated with small shrubs. The channel was slightly entrenched and highly sinuous. Mean stream gradient was less than 2 percent. Mean canopy cover was 5 percent and instream woody debris densities were less than $0.1/m^2$. Riffle/pool ratios were 1.7:1 and 2.8:1 in 1993 and 1994, respectively. Mean residual pool depths were 0.8 meters for 1993 and 1994, respectively (Table 3.19). Channel stability ratings varied from poor to fair in 1993 and 1994, respectively and were generally less stable than downstream reaches (Table 3.19). Channel capacity was inadequate to contain bankfull flows. Lower banks were generally comprised of sand and gravel sized material. Scour and deposition were the dominant channel forming processes in the reach. The channel bottom was in a constant state of flux and deposition of fine sediment resulted in reduced pool volumes. No RASI surveys were completed for this reach. Total available habitat increased during 1994.

Reach ten has a total length of 2,846 meters and encompasses elevations ranging from 2,640 feet to 2,750 feet (Figure 2.2). The reach was classified as a C6 channel type with slight entrenchment and high sinuosity (Table 3.20). Dominant land use was livestock grazing with a riparian area comprised of large shrubs. The reach had instream woody debris densities of $8.5/100\ m^2$. Average residual pool depth was 0.9 meters in 1993 and 0.5 meters in 1994 (Table 3.20). Channel stability was rated as fair (Table 3.20). Landform slope ranged from zero to twenty five percent with no evidence of mass wasting. Stream bank vegetation was comprised of shallow rooted species. Debris jam potential was high for the entire reach. Channel capacity was insufficient to contain peak flows. There was evidence of frequent channel migration, and a significant amount of bank cutting and sloughing had occurred. A moderate amount of gravel and sand deposition was identified on old and new bars. The channel bottom consisted of a loose assortment of well-rounded material. Stable bottom materials occurred on 20-50 percent of the reach. Seasonal algal blooms were observed. Dominant habitat complex in this reach was riffle-pool with a riie to pool ratio of 3.5:1 for 1993 and 1994. Total available habitat decreased during 1994.

Reach eleven was classified as a E6 channel type and extended for 589 meters (Figure 2.2). Elevations ranged from 2,750 feet to 2,760 feet. Dominant land use was livestock grazing and riparian areas were primarily vegetated with large shrubs. Riparian vegetation provided 21 percent stream canopy cover and instream large woody debris densities were less than $0.1/100m^2$. The channel was slightly entrenched (width:depth ratio = 3.9) and highly sinuous (Table 3.21).

Table 3.19. Summary table showing values for reach nine, Benewah Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,640-2,640 ft	2,640-2,640 ft
Dominant land use	Livestock grazing	Livestock grazing
Riparian ecotype	Coniferous/ Deciduous mix with shrubs	Coniferous/deciduous mix with shrubs
Reach length	1,032 m	868 m
Channel type	C5	C5
Bankfull width	80 ft	•
Bankfull depth	6 ft	•
Width/depth ratio	13.3	
Mean stream gradient	1.75 %	1.3 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	poor (122)	fair (90)
RASI values	NA	NA
% substrate < 4mm	NA	NA
mean substrate size (mm)	NA	NA
Mean % canopy cover	45 %	10.5 %
Barriers	none	none
# instream woody debris	29 (0/100 m^2)	74 (0/100 m^2)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	1.7: 1	2.8 : 1
Residual pool depth	0.8 m	0.8 m
Total available habitat	27,231 m^2	60,016 m^2

Table 3.20. Summary table showing values for reach ten, Benewah Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,640-2,750 ft	2,640-2,750 ft
Dominant land use	Livestock grazing	Livestock grazing
Riparian ecotype	Coniferous/ Deciduous mix with shrubs	Coniferous/deciduous mix with shrubs
Reach length	2,846 m	693 m
Channel type	C6	C6
Bankfull width	30ft	•
Bankfull depth	2ft	•
Width/depth ratio	13.3	*
Mean stream gradient	1 %	1.2 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	medium fair (100)	•
RASI values	•	•
% substrate < 4mm	•	•
mean substrate size (mm)	•	•
Mean % canopy cover	0%	0%
Barriers	none	none
# instream woody debris	242 (8.5/100 m^2)	58 (8.2/100 m^2)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	3.5 : 1	3.5 : 1
Residual pool depth	0.9 m	0.5 m
Total available habitat	39,637 m^2	5,689 m^2

Table 3.21. Summary table showing values for reach eleven, Benewah Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,750-2,760 ft	2.750-2.760 ft
Dominant land use	Livestock grazing	Livestock grazing
Riparian ecotype	Coniferous/Deciduous mix with shrubs	Coniferous/deciduous mix with shrubs
Reach length	589 m	1,145 m
Channel type	E6	E6
Bankfull width	27 ft	•
Bankfull depth	6.9 ft	•
Width/depth ratio	3.9	[illegible]
Mean stream gradient	1 %	1.2 %
Entrenchment	slight	slight
Sinuosity	very high	very high
Channel stability rating	high poor (125)	high poor (115)
RASI values	NA	NA
% substrate < 4mm	NA	NA
mean substrate size (mm)	NA	NA
Mean % canopy cover	21.4 %	35 %
Barriers	none	none
# instream woody debris	25 (0.1/100 m^2)	32 (0.1/100 m^2)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	2.4 : 1	2.3 : 1
Residual pool depth	0.7 m	0.4 m
Total available habitat	6,23[illegible] m^2	4,439 m^2

Mean stream gradient was 1 percent and mean residual pool depth was 0.7 and 0.4 meters for 1993, and 1994, respectively (Table 3.21). Channel stability was rated as poor (Table 3.21). Landform slope ranged from O-5 percent and no mass wasting was evident on the upper banks. Shallow rooted plant species provided discontinuous bank cover. Lower banks lacked a cohesive structure, resulting in continous bank cutting and extensive fine sediment deposition. Debris jam potential was estimated to be high. Channel capacity was adequate to contain peak flows. Channel substrate was comprised of a loose assemblage of fine gravels and sand and appeared to be in a constant state of flux. Dominant habitat complex was riffle pool with total available habitat declining in 1994.

Reach twelve is 1,257 meters in length and encompasses elevations ranging from 2,760 feet to 2940 feet (Figure 2.2). The reach was classified as a C5-C6 channel type (Table 3.22). This is a fourth order drainage with an average stream gradient of less than 1 percent. Dominant land use was forest production and livestock grazing. Riparian areas were dominated by large shrub species. Average canopy closure was 52 percent and instream woody debris densities were 28.1/1 00 m^2 in 1993. In 1994 average canopy closure was 44 percent and instream woody debris densities were 13.2/100 m^2. Riffle to pool ratios was 1.3:1 and mean residual pool depths were 0.4 meters in 1993. IN 1994 riffle-pool ratio was 2: 1 and residual pool depth was 0.4 meters. (Table 3.22). Channel stability was rated as poor (Table 3.22). Landform slope was less than one percent and no sediment sources were associated with the floodplain. Riparian vegetation showed signs of overgrazing and shallow-rooted plant species provided only discontinuous bank cover. Overbank flows were common in stream segments degraded by cattle use. Lower banks consisted primarily of gravel and smaller sized material and bank failure resulting from undercutting was common. Extensive deposition of fine sediment accelerated bar development. The channel bottom was composed of loose, well rounded sediments with evidence of scouring and deposition occurring year long. Aquatic vegetation was absent in this reach.

Reach thirteen extends 1,508 meters up the mainstem of Benewah Creek beginning at the confluence with the South Fork Benewah Creek (Figure 2.2). The reach is a second order drainage and encompasses elevations ranging from 2,940 to 3,060 feet. The dominant land type was forest with a riparian area comprised mainly of young coniferous and deciduous trees. The reach was classified as a E4 channel type characterized by very high sinuosity and slight entrenchment. Mean stream gradient was 2 percent (Table 3.23). Average stream canopy cover was 75 percent with woody debris densities of 32.4/100 m^2 in 1993. In 1994, average stream canopy cover was 84 percent with woody debris densities of 17.2/100 m^2. Mean residual pool depth was 0.4 meters in

Table 3.22. Summary table showing values for reach twelve, Benewah Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,760-2,940 ft	2,760-2,940 ft
Dominant land use	Forest/Livestock grazing	Forest/Livestock grazing
Riparian ewtype	Coniferous/deciduous mix with shrubs	Coniferous/deciduous mix with shrubs
Reach length	1,257 m	1,412 m
Channel type	C5 - C6	C5 - C6
Bankfull width	NA	*
Bankfull depth	3.0 ft	•
Width/depth ratio	NA	*
Mean stream gradient	<1 %	1.2 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	mediuim poor (129)	poor (115)
RASI values	NA	NA
% substrate < 4mm	NA	NA
mean substrate size (mm)	NA	NA
Mean % canopy cover	51.6 %	44 %
Barriers	none	none
# instream woody debris	355 (28.1/1 00 m^2)	186 (13.2/100 m^2)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	1.3 : 1	2 : 1
Residual pool depth	0.4 m	0.4 m
Total available habitat	10,197 m^2	12,394 m^2

Table 3.23. Summary table showing values for reach thirteen, Benewah Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	2nd	2nd
Elevation	2,940-3,060 ft	2,940-3,060 ft
Dominant land use	Forest	Forest
Riparian ecotype	Coniferous/Deciduous mix with young trees	Coniferous/Deciduous mix with young trees
Reach length	1,508 m	761 m
Channel type	E4	E4
Bankfull width	15ft	•
Bankfull depth	2 .5 ft	•
Width/depth ratio	6	
Mean stream gradient	2 %	3.8 %
Entrenchment	slight	slight
Sinuoisity	very high	very high
Channel stability rating	high fair (83)	fair (107)
RASI values	NA	NA
% substrate < 4mm	NA	NA
mean substrate size (mm)	NA	NA
Mean % canopy cover	75.3 %	84%
Barriers	none	none
# instream woody debris	488 (32.41100 m^2)	131 (17.2/100 m^2)
Dominant habitat complex	riffle-pool /step pool rapid	riffle-step pool
Riffle/pool ratio	1 : 1.2	2 : 1
Residual pool depth	0.4 m	0.7 m
Total available habitat	13,783 m^2	6,873 m^2

1993 and 0.7 meters in 1994. This reach had a channel stability rating of fair (Table 3.23). Upper bank slope ranged from O-20 percent and included examples of historic bank failures that had stabilized over time. Debris jam potential was minimal with only small woody debris present in the channel. Vegetation covered 70-90 percent of the upper banks, but plant communities lacked the species diversity found in other reaches. The channel capacity was adequate for containing existing peak flows. Lower banks contained small cobble-sized materials with only minor cutting occurring at obstructions and outcurves. New bar development was minimal. The channel bottom was moderately stable and very little scouring and deposition was observed in the reach. The dominant habitat complex was a riffle-step pool complex. Total available habitat declined in 1994.

Reach fourteen consisted of 3,293 meters of the South Fork Benewah Creek (denoted on Figure 2.2 as reaches 13a and 14a) beginning at the confluence with the mainstem. Dominant land use is livestock grazing and riparian areas are dominated by young conifers and deciduous trees, and shrubs. The reach was classified as E3b and E4 channel types and encompassed elevations ranging from 2,647 to 3,061 feet (Table 3.24). Average stream canopy cover was 52 percent and densities of instream woody debris were 12.111 $00m^2$ in 1993. In 1994, mean stream canopy cover was 76 percent with densities of instream woody debris of $2.9/100m^2$. The dominant habitat complex was riffle-pool/step pool rapid. Riffle to pool ratio was 1.1: 1 and 2.7: 1 in 1993 and 1994, respectively. Mean residual pool depth remair ed constant in 1993 and 1994 at 0.2 meters (Table 3.24). Channel stability was rated fair to good (Table 3.24). Upper bank slopes ranged from O-15 percent with no evidence of mass wasting. Debris jam potential was minimal with mostly small twigs and limbs present. Upper bank vegetation consisted mainly of shrubs and covered 50 to 70 percent of the surface area. The channel capacity was adequate for existing peak flows. Minor bank cutting was observed at obstructions and outcurves. Some fresh deposition of gravel sized material was noted on point bars. Bottom materials were moderately packed and stable. RASI surveys were conducted at one location on the South Fork Benewah Creek in 1993. The index value of 50 suggested an equilibrium had been reached between scour and depositional processes (Table 3.24). Levels of fine sediment were higher than other downstream reaches (20 percent).

3.1.3. Evans Creek

Channel typing surveys identified 10 reaches in the Evans Creek watershed. Reaches l-7 are located on the mainstem, reach 5a encompasses the North Fork drainage, and reaches 5b and 6b are located on the South Fork Evans Creek (Figure 2.3). Physical conditions are described below for reaches l-7 on the mainstem, reach 5a on the North Fork, and 5b and 6b on the South

Table 3.24. Summary table showing values for reach fourteen, Benewah Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	3rd	3rd
Elevation	2,847-3,061 ft	2,847-3,061 ft
Dominant land use	Forest /Livestock grazing	Forest/Livestock grazing
Riparian ecotype	Coniferous/Deciduous mix with shrub/young trees	Coniferous/Deciduous mix with shrub/young trees
Reach length	3,293 m	3,493 m
Channel type	E3b - E4	E3b - E4
Bankfull width	22 ft	•
Bankfull depth	2.2 ft	•
Width/depth ratio	[illegible]	*
Mean stream gradient	3 %	<1 %
Entrenchment	slight	slight
Sinuoisity	very high	very high
Channel stability rating	low good (76)	medium good (92)
RASI values	50	•
% substrate < 4mm	20.1	•
mean substrate size (mm)	76	•
Mean % canopy cover	51.7 %	76 %
Barriers	none	none
# instream woody debris	398 (0/100 m^2)	103 (0/1 00 m^2)
Dominant habitat complex	riffle - pool/step pool rapid	riffle / step pool
Riffle/pool ratio	1.1 : 1	2.7 : 1
Residual pool depth	0.2 m	0.2 m
Total available habitat	54,795 m^2	24,604 m^2

Fork. For general descriptions to summarize conditions, mainstem reaches 5-7 were combined and reaches 5b and 6b of the South Fork were combined.

Reach one of Evans Creek was classified as a C6 channel type with a total length of 880 meters (Figure 2.3). Evans Creek is a third order drainage at the mouth. Dominant land use within this reach was livestock grazing. The riparian area was dominated by grasses and small shrubs. The channel is highly sinuous and mean stream gradient is less than 1 percent (Table 3.25). Average canopy cover in this reach was 28 percent in 1993 and 16 percent in 1994. No instream woody debris was present. Riffle to pool ratio was 1.7:1 and mean residual pool depth was 0.4 meters (Table 3.25). This reach received a poor channel stability rating as a result of a combination of unstable conditions on the upper and lower banks and channel. Landform slope ranged from O-3 percent and no evidence of mass wasting problems were present, however, upper bank vegetation was shallow rooted and discontinuous, covering less than 50 percent of the surface area. Debris jam potential was limited to small limbs and twigs. The channel capacity had been reduced as a result of frequent bank failures and was inadequate to contain bankfull flows. The lower banks consisted mainly of highly erodible fine sediment. The channel bottom was unstable and accelerated bar development was observed throughout this reach.

Reach two extended 1,581 meters and was classified as a C3 channel type (Figure 2.3). Dominant land use within this reach was livestock grazing. The riparian area was dominated by mature trees and shrubs. Average canopy cover in this reach was 52 percent with instream woody debris loads of 1.5/1 00 m^2 in 1993. in 1994, average canopy cover was 34 percent with instream woody debris densities 9.4/100m^2. Residual pool depths averaged 0.2 meters in 1993 and 0.6 meters in 1994 (Table 3.26). Channel stability rated from poor to fair (Table 3.26). Upper bank slopes were generally less than 3 percent and no mass wasting was evident. Bank vegetation consisted of discontinuous, shallow rooted species with a density of less than 50 percent. Channel capacity was reduced due to channel alterations and allowed for occasional overbank flooding. There was significant amounts of bank cutting and sloughing, as well as accelerated bar development. Riffle armor stablity index values were highly variable, ranging from 39.8 to 75.2 (mean=59) in 1993 and 89.4 to 97.5 (mean=93) in 1994 (Table 3.26). Fine sediment (< 4 mm) generally comprised less than 10 percent of the sampled substrate with the exception of a single measurement (36 percent) taken in 1993 (Table 3.26). Dominant habitat complex was riffle-pool with total available habitat decreasing in 1994.

Reach three is 1,722 meters in length and encompasses elevations ranging from 2,130 to 2,270 feet (Figure 2.3). Dominant land use within this reach was forested. The riparian area was dominated by mature coniferous

Table 3.25. Summary table showing values for reach one, Evans Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	3rd	3rd
Elevation	2,130-2,130 ft	2,130-2,130 ft
Dominant land use	Livestock grazing	Livestock grazing
Riparian ecotype	Coniferous/deciduous grasses/forbs	Coniferous/deciduous grasses/forbs
Reach length	880 m	1,583 m
Channel type	C6	C6
Bankfull width	21 ft	•
Bankfull depth	2 ft	•
Width/depth ratio	10	•
Mean stream gradient	<1 %	1.3 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	high poor (122)	high poor (125)
RASI values	NA	NA
% substrate < 4mm	NA	NA
mean substrate size (mm)	NA	NA
Mean % canopy cover	28.3 %	16.0 %
Barriers	none	none
# instream woody debris	0 (0/100 m^2)	5 (0/100 m^2)
Dominant habitat complex	pool-riffle	riffle-pool
Riffle/pool ratio	1.7 : 1	1 : 1
Residual pool depth	0.4 m	0.5 m
Total available habitat	35,957 m^2	9,556 m^2

Table 3.26. Summary table showing values for reach two, Evans Creek, 1993 and I994

PARAMETER	1993	1994
Stream order	3rd	3rd
Elevation	2,130-2,130 ft	2.130-2.130 ft
Dominant land use	Forest /Livestock grazing	Forest/Livestock grazing
Riparian ecotype	Coniferous/deciduous mix with mature trees/shrubs	Coniferous/deciduous mix with mature trees/shrubs
Reach length	1,581 m	965 m
Channel type	c3	c3
Bankfull width	25ft	*
Bankfull depth	3ft	*
Width/depth ratio	7.8	6.0
Mean stream gradient	1 %	1.3 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	high poor (119)	meduim fair (101)
RASI values	75; 40; 63	91; 98; 89
% substrate < 4mm	14 %	6.6 %
mean substrate size (mm)	66	145
Mean % canopy cover	51.8 %	34.1 %
Barriers	none	none
# instream woody debris	76 (4.0/100 m^2)	26 (O/100 m^2)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	1.2: 1	1.2: 1
Residual pool depth	0.2 m	0.6 m
Total available habitat	75,090 m^2	25,006 m^2

Table 3.27. Summary table showing values for reach three, Evans Creek, 1993 and l994

PARAMETER	1993	1994
Stream order	3rd	3rd
Elevation	2,130-2,270 ft	2,130-2,270 ft
Dominant land use	forested	forested
Riparian ecotype	Coniferous/deciduous mix mature trees/shrubs	Coniferous/deciduous mix mature trees/shrubs
Reach length	1,722 m	927 m
Channel type	E3b	E3b
Bankfull width	ft	*
Bankfull depth	ft	•
Width/depth ratio		•
Mean stream gradient	2 %	1.9 %
Entrenchment	slight	slight
Sinuoisity	very high	very high
Channel stability rating	fair (95)	fair (94)
RASI values	67; 82; 60	84; --; 92
% substrate < 4mm	19	18.9
mean substrate size (mm)	98	136
Mean % canopy cover	65.2 %	44.1 %
Barriers	none	none
# instream woody debris	56 (3.2000 m^2)	90 (9.7/100 m^2)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	1.6: 1	1.2: 1
Residual pool depth	1.5 m	0.5 m
Total available habitat	21.471 m^2	14.471 m^2

and deciduous trees and large shrubs. The reach was classified as a E3b channel type (Table 3.27). Mean stream gradient was 2 percent, channel entrenchment was slight (>2.4) and sinuosity was very high (>1.5). Average stream canopy cover was 65 percent and instream woody debris loads were 3.3/100m2 in 1993. In 1994, average stream canopy cover was 44% with instream woody debris densities of $9.7/100m^2$. Riffle to pool ratio stayed relatively unchanged for 1993 and 1994 at 1.6: 1 and 1.2:1, respectively. Mean residual pool depths decreased in 1994 from 1.5 meters in 1993 to 0.5 meters in 1994 (Table 3.27). This decrease corresponded to a decrease in total available habitat. Channel stability rated fair (Table 3.27). Density of bank vegetation was 70-90 percent. Debris jam potential was abundant but mostly in the form of small twigs and limbs. The channel capacity was adequate to contain peak flows. Slight bank cutting occurred at flow deflectors and outcurves, and some new point bar development was noted. Mean RASI values were higher in 1994 than in 1993 (88 and 70, respectively). Mean percent fines (< 4 mm) were 17 and 19 for 1993 and 1994, respectively (Table 3.27).

Reach four is 1,800 meters in length and encompasses elevations ranging from 2,270 to 2.580 feet (Figure 2.3). Dominant land use was forested with the riparian area nsisting of a mix of mature coniferous and deciduous trees. The reach was cl, sified as a B3a channel type with moderate entrenchment and sinuosity (Table 3.28). Mean stream gradient was 3 percent. Average canopy cover was 69 percent with instream woody debris at densities of 1 $X100\ m^2$ in 1993. In 1994, average stream canopy cover decreased to 44 percent while instream woody debris increased to 10.2/l 00 m^2. Riffle to pool ratio was 1:32 and mean residual pool depth was 0.3 meters in 1993. In 1994, the riffle to pool ratio was 1.2:1 with a mean residual pool depth of 0.3 meters. (Table 3.28). Channel stability rating fair for this reach (Table 3.28). Upper bank slopes ranged from 2040 percent with intermittent, older bank failures noted. Bank vegetation density was greater then 90 percent with high diversity of both shallow and deep rooted species. The channel capacity was adequate for existing flow conditions. There was a moderate amount of lower bank cutting at obstructions and outcurves, and some new gravel bar development in this reach. The channel bottom throughout the reach was fairly stable with approximately 5-12 percent of the bottom substrate affected by scouring and deposition. Algal blooms and moss were observed in this reach in slack and swift water. Mean RASI values were considerably higher in 1994 than in 1993 (89 compared with 41) as were the geometric mean diameters of point bar particles (164 mm compared with 84 mm). Fine sediment (< 4 mm) comprised an average of 13 and 22 percent in 1993 and 1994, respectively (Table 3.28).

Channel surveys were conducted on 990 meters of the mainstem upstream of the three forks area (Figure 2.3). This is a second order drainage

Table 3.28. Summary table showing values for reach four, Evans Creek, 1993 and l994

PARAMETER	1993	1994
Stream order	3rd	3rd
Elevation	2,270 -2,580 ft	2,270-2,580 ft
Dominant land use	Forested	Forested
Riparian ecotype	Coniferous/deciduous mix with mature trees	Coniferous/deciduous mix with mature trees
Reach length	1,800 m	1,818 m
Channel type	B3a	B3a
Bankfull width	•	•
Bankfull depth	•	•
Wrdth/depth ratio	•	•
Mean stream gradient	3 %	2.8 %
Entrenchment	moderate	moderate
Sinuoisity	moderate	moderate
Channel stability rating	low good (77)	fair (86)
RASI values	59; 61; 57	90; 93; 85
% substrate < 4mm	13	21.8
mean substrate size (mm)	84	164
Mean % canopy cover	69.4 %	44 %
Barriers	none	none
# instream woody debris	21 (1.2/l 00 ft)	186 (10.2/l 00 linear ft)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	1 : 32	1.2: 1
Residual pool depth	0.3 m	0.3 m
Total available habitat	25,541 m^2	30,505 m^2

Table 3.29. Summary table showing values for reach five, Evans Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	2nd	2nd
Elevation	2,580-3,340 ft	2.580-3340 ft
Dominant land use	Forested	Forested
Riparian ecotype	Coniferous/deciduous mix with mature trees	Coniferous/deciduous mix with mature trees
Reach length	990 m	735 m
Channel typt	A2a - B3a	A2a - B3a
Bankfull widt:	•	[illegible]
Bankfull depth	•	*
Width/depth ratio	17.3	•
Mean stream gradient	[illegible]	3.1 %
Entrenchment	moderate	moderate
Sinuoisity	moderate	moderate
Channel stability rating	good (67)	good (72)
RASI values	43; 52; 31	60; 62; 64
% substrate < 4mm	22 %	13.6 %
mean substrate size (mm)	75	123
Mean % canopy cover	37.5 %	59.7 %
Barriers	none	none
# instream woody debris	90 (9.1 /lo0 m^2)	191 (25.91100 m^2)
Dominant habitat complex	step - pool : rapid	step - pool : rapid
Riffle/pool ratio	1 : 1.3	1 :6
Residual pool depth	0.5 m	0.5 m
Total available habitat	10,696 m^2	17,779 m^2

with elevations beginning at 2,580 feet and rising to 3,340 feet. The reach was comprised of A and B channel types with moderate to high entrenchment ratios (< 2.2) and low to moderate sinuosity (Table 3.29). Stream gradient varied from 7 to 10 percent. Average stream canopy cover was 37.5 percent with instream woody debris densities of 9.11100 m^2 in 1993. In 1994, average stream canopy cover was 59.7 percent with instream woody debris densities of 25.9/100 m^2. Riffle to pool ratio was 1: 1.3 and mean residual pool depth was 0.5 meters. Channel stability was rated good (Table 3.29). Upper bank slopes ranged from 1 O-90 percent with no evidence of mass wasting problems. Upper bank vegetation density was greater than 90 percent with both shallow and deep rooted species represented. The channel capacity was adequate for existing peak flows. There were few obstructions or flow deflectors in this reach. Lower bank cutting was minimal with only a few areas of new gravel bar development. The channel bottom was stable with abundant moss and algal growth noted throughout the reach. The Old Rainbow Mine is located in the upper segment of reach 7 (Figure 4.3). In this area some small bank failures were observed on steeper, less stable slopes. Lower bank cutting was observed at obstructions and outcurves, with moderate amounts of new bar development from coarse gravels. Mean RASI values were 42 and 62 for 1993 and 1994, respectively. Fine sediment comprised up to 23 percent of the sampled substrate in 1993 and up to 17 percent in 1994 (Table 3.29).

Physical surveys were conducted on 977 meters of the North Fork Evans Creek encompassing elevations ranging from 2,580 to 3,170 feet (Figure 2.3). This reach is a second order stream. The dominant land use was forested with some areas of livestock grazing. The riparian area consisted of mature coniferous and deciduous trees and shrubs. This drainage included B3a and E3b channel types (Table 3.30). Average stream gradient was 10 percent. Average canopy cover in this reach was 34 percent with instream woody debris densities of 1.61100 m^2. Riffle to pool ratio was 3:1 and average residual pool depth was 0.3 meters (Table 3.30). No significant changes were reported in 1994. Channel stability ranged from fair to good (Table 3.30). Upper bank slopes ranged from 0-45 percent with no evidence of mass wasting problems. Bank vegetation density varied from 70-90 percent. Plant density was less vigorous in some areas as a result of encroachment of the north fork road. There were fair amount of debris jam potential in this reach. The channel capacity was adequate for existing peak flows. Small amounts of bank cutting occurred at obstructions and outcurves with some new bar develoment resulting from deposition of gravels. Clinging aquatic vegetation was abundant throughout this reach.

Surveys were conducted along 694 meters of the South Fork Evans Creek (Figure 2.3). This is a second order drainage with elevations beginning at 2,580 feet and rising to 3,040 feet. Dominant land use is forested with the

Table 3.30. Summary table showing values for reach six, (north fork) Evans Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	2nd	2nd
Elevation	2,580-3,170 ft	2,580-3,170 ft
Dominant land use	Forested/Livestock grazing grazing	Forested/Livestock grazing
Riparian ecotype	Coniferous/Deciduous with mature timber	Coniferous/Deciduous with mature timber
Reach length	977 m	1,015 m
Channel type	B3a - E3b	B3a - E3b
Bankfull width	•	*
Bankfull depth	•	•
Width/depth ratio	6.3	•
Mean stream gradient	10%	10.8 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	good (70)	good (72)
RASI values	NA	NA
% substrate < 4mm	NA	NA
mean substrate size (mm)	NA	NA
Mean % canopy cover	34%	39 %
Barriers	none	none
# instream woody debris	50 (1.6 /100 ft)	35 (1 /100 ft)
Dominant habitat complex	step-pool cascade	step-pool cascade
Riffle/pool ratio	3 : 1	5 : 1
Residual pool depth	0.3 m	0.2 m
Total available habitat	5,996 m^2	6,526 m^2

Table 3.31. Summary table showing values for reach seven, (south fork) Evans Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	2nd	2nd
Elevation	2,580-3,040 ft	2,580-3,040 ft
Dominant land use	Forested	Forested
Riparian ecotype	Coniferous/deciduous mix with mature trees	Coniferous/deciduous mix with mature trees
Reach length	694 m	665 m
Channel type	A2 - A4	A2 - A4
Bankfull width	•	•
Bankfull depth	*	•
Width/depth ratio	11.1	•
Mean stream gradient	8.1 %	8.1 %
Entrenchment	high	high
Sinuoisity	low	low
Channel stability rating	fair (76)	fair (82)
RASI values	63 ; 85 ; 72	65 ; 78 ; ---
% substrate < 4mm	23 %	38.5%
mean substrate size (mm)	80	67
Mean % canopy cover	70.0 %	66 %
Barriers	none	none
# instream woody debris	86 (3.8 /100 ft)	34 (2 /100 ft)
Dominant habitat complex	step - pool : rapid	step - pool : rapid
Riffle/pool ratio	NA	5 : 1
Residual pool depth	NA	0.2
Total available habitat	2,827 m^2	7,960 m^2

riparian area consisting of mature coniferous and deciduous trees. This reach was classified as an A channel type. Average stream gradient was 8 percent with some areas in excess of 15 percent. Average canopy cover in this reach was 70 percent with instream woody debris densities of 3.81100 m^2. The dominant habitat complex in this reach was step-pool/rapid (Table 3.31). Channel stability was rated · to good (Table 3.31). Upper bank slopes ranged from 30-75 percent with sor ifrequent, small upper bank failures, and some older healed bank failures. L debris dams were common throughout the reach with abundant recruitable sized materials located within the floodplain. Upper bank vegetation varied from a vigorous assemblage of deep and shallow rooted species with a density greater then 90 percent to less vigorous communities. The channel capacity was barely adequate to contain peak flows. Most bank cutting occurred as a result of obstructions created by debris dams. Some new gravel bar development was noted in the more sinuous segments of the reach. Increased filling of pools with silts and sands was observed in the upper reaches of this segment. There was abundant clinging aquatic vegetation throughout this reach. RASI values ranged from 63.4 to 84.6 and percent fine sediment was greater than in all downstream reaches (mean=39 percent).

3.1.4. Alder Creek

Channel surveys identified 13 reaches in the Alder Creek watershed (Figure 2.4). Nine of these reaches were located in the mainstem of Alder Creek and four reaches were located in the North Fork drainage. of the nine reaches identified in the mainstem of Alder Creek, reaches one and two were combined for general descriptions and were labeled reach one. Reaches three and four were also combined and labeled reac two. Reaches five and six were also combined and labeled reach three. In the North Fork drainage reach 2a and 3a were combined into reach two, North Fork Alder Creek.

Reach one is 881 meters in length and encompasses elevations ranging from 2,260 to 2,350 feet (Figure 2.4). The dominant land type in this reach is forested/floodplain with a riparian area consisting of young coniferous/deciduous trees, shrubs, forbs and grasses. The reach was classified as a B3a-B3c channel type (Table 3.32). Average s. am canopy cover was 32 percent with instream woody debris density of 1.61 00 m^2 for 1993. In 1994 average stream canopy was 22 percent with instream woody debris densities of 32/100 m^2. Riffle to pool ratio was l-4:1 and mean residual pool depth was 0.6 meters (Table 3.32). Channel stability was rated as fair to good (Table 3.32). Upper bank slopes ranged from 5-60 percent with no evidence of mass wasting problems. Vegetation density on the upper slopes was quite vigorous (90 percent density). Debris jam potential was moderate, consisting mostly of small twigs and limbs. The channel capacity is barely adequate to contain existing

Table 3.32. Summary table showing values for reach one, Alder Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,260-2,350 ft	2,260-2,350 ft
Dominant land use	Forested	Forested
Riparian ecotype	Coniferous/deciduous mix with young trees, shrubs & grasses	Coniferous/deciduous mix young timber/shrubs & 8 grasses
Reach length	881 m	876 m
Channel type	B3a - B3c	B3a - B3c
Bankfull width	ft	•
Bankfull depth	ft	•
Width/depth ratio		•
Mean stream gradient	2 %	5 %
Entrenchment	moderate	moderate
Sinuoisity	moderate	moderate
Channel stability rating	fair (88)	good (76)
RASI values	32; 38; 29	58; 69; 39
% substrate < 4mm	7.7	9.5
mean substrate size (mm)	57	136
Mean % canopy cover	32%	22%
Barriers	none	none
# instream woody debris	14 (1.61100 m^2)	28(3.2/100 m^2)
Dominant habitat complex	riffle - pool	riffle - ~001
Riffle/pool ratio	1.4: 1	1:l
Residual pool depth	0.6 m	0.7 m
Total available habitat	28,242 m^2	18,411 m^2

peak flows. Bank cutting is limited to outcurves and constrictions with moderate amounts of sand and gravel deposition. Mean RASI values were 33 and 55 in 1993 and 1994, respectively. Fine sediment (< 4 mm) comprised less than 10 percent of the sampled substrate in both 1993 and 1994 (Table 3.32). Dominant habitat complex consisted of riffle-pool with total available habitat declining in 1994.

Reach 2 extends for 4,188 meters and encompass elevations ranging from 2,350 to 2,630 feet (Figure 2.4). The upstream end of this reach is delineated by a twenty-five foot bedrock waterfall. This waterfall acts as a fish passage barrier except for in extreme high water years. Dominant land type was forested with livestock grazing occurring on the adjacent uplands. The riparian area was dominated by mature coniferous and deciduous trees with shrubs, forbs, and grasses present. The reaches included A2 and A3 channel types. The channel was highly entrenched, had low sinuosity, and a mean stream gradient of 3 percent (Table 3.33). Average stream canopy cover was 30 percent and instream woody debris densities were 0.5/100 feet. Riffle to pool ratio was 1.2: 1 and mean residual pool depth was 0.6 meters (Table 3.33). Channel stability rated fair to good (Table 3.33). Upper bank slopes ranged from 65-86 percent and were marked by frequent bank failures and small areas of mass wasting. Vegetation density was greater then 90 percent. Debris jam potential was moderate and consisted mainly of small woody debris. The channel capacity was adequate for existing peak flows. Bank cutting occurred at obstructions and outcurves with some newly developed gravel bars noted. Clinging aquatic vegetation was common in most areas of the reach. Mean RASI values were 25 and 59 in 1993 and 1994, respectively. Fines (c 4 mm) comprised an average of 7 percent of the sampled substrate in 1993 and 11 percent in 1994 (Table 3.33).

Reach 3 of Alder Creek were classified as C3 type channel with some higher gradient areas resembling E3b type channels (Table 3.36). The reach encompasses 2,439 meters and elevations vary from 2,163 to 2,700 feet (Figure 2.4). Dominant land use in this reach was livestock grazing. The riparian area consisted of shrubs, grasses and forbes. Average canopy cover was 32 percent with very little instream woody debris present (c O.l/lOO feet). Dominant habitat complex was rif8e pool with one area of this reach consisting of a bedrock/boulder cascade area. Riffle to pool ratio was 1.3:1 and mean residual pool depth was 1.2 meters during 1993. In 1994, riie to pool ratio was 4.4:1 with a mean residual pool depth of 0.2 meters. This reach of Alder Creek had a channel stabilty rating of good (Table 3.34). Upper bank slopes were predominantly less than 30 percent, though intermittent portions had slopes up to 80 percent. Debris jam materials consisted of small limbs and twigs. Vegetation density was 70-90 percent, but consisted mostly of shallow rooted species. The channel capacity was adequate for existing peak flows. Bank

Table 3.33. Summary table showing values for reach two, Alder Creek, 1993and1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,350-2,630 ft	2,350-2,630 ft
Dominant land use	Livestock grazing/forested	Livestock grazing/forested
Riparian ecotype	Coniferous/deciduous mix with mature trees, shrubs, forbs and grasses	Coniferous/deciduous mix mature trees, shrubs, forbs and grasses
Reach length	4,188 m	4,207 m
Channel type	A2-A3	A2-A3
Bankfull width	ft	•
Bankfull depth	[illegible]	•
Width/depth ratio	[illegible]	•
Mean stream gradient	3 %	4 %
Entrenchment	high	high
Sinuoisity	low	low
Channel stability rating	slog (73)	cl& (73)
RASI values	33; 25; 16	62; 66; 50
% substrate < 4mm	7.3	10.5
Barriers	none	none
# instream woody debris	70 (0.5 /100 ft)	50 (6.4 /100 ft)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	1.2 : 1	4: 1
Residual pool depth	0.6 m	0.8 m
Total available habitat	30.361 m^2	96.260 m^2

Table 3.34. Summary table showing values for reach three, Alder Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2.1632,700 ft	2,163-2,700 ft
Dominant land use	Livestock grazing	Livestock grazing
Riparian ecotype	Coniferous/deciduous mix with shrubs, forbs,grasses	Coniferous/deciduous mix with shrubs,forbs,grasses
Reach length	2,490 m	2,439 m
Channel type	C3 - E3b	C3 - E3b
Bankfull h	ft	*
Bankfull	ft	•
Width/depth ratio	11.3	*
Mean stream gradient	2 %	2.5 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	god (68)	good (72)
RASI values	28; 40; 31	60; 46; 71
% substrate < 4mm	9.6	9.4
mean substrate size (mm)	48	162
Mean % canopy cover	32 %	32 %
Barriers	none	none
# instream woody debris	14 (0.1 /100 ft)	15 (0.2 /100 ft)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	1.3: 1	4.4 : 1
Residual pool depth	1.2 m	0.2 m
Total available habitat	42.423 m^2	55.005 m^2

cutting occurred at flow deflectors and outcurve areas. Some new bar development had occurred as evidenced by coarse gravel deposition. The channel bottom was fairly stable. Clinging aquatic vegetation was common throughout the reach with both algae and moss present. Mean RASI values were 33 and 59 in 1993 and 1994, respectively. Fine sediment (< 4 mm) comprised less than 10 percent of the sampled substrate in both 1993 and 1994 (Table 4.4.3).

Reach four extended for 5,053 meters and encompassed elevations ranging from 2,700 to 2,900 feet (Figure 2.4). Dominant land use in this reach was livestock grazing. The riparian area consisted of mature deciduous/coniferous trees, shrubs, grasses and forbs. The channel was classified as a C3 channel type with a mean stream gradient of 1.5 percent (Table 3.35). Average canopy cover was much lower than other reaches in the drainage (6 percent) with instream woody debris densities of 0.51100 feet. Riffle to pool ratio was 1.2:1 in 1993 and 2.6:1 in 1994. Mean residual pool depth was 0.5 meters for both 1993 and 1994. Channel stability was rated as fair (Table 3.35). Upper bank slopes ranged from 2-35 percent with no evidence of mass wasting problems. Vegetative bank protection was provided by both deep and shallow rooted species. Vegetative cover, however, was largely absent from outside meander bends, leaving these areas more susceptable to erosive action. Debris jam material consisted of small woody debris. The channel capacity was ample for existing peak flows. Significant amounts of bank cutting in this reach provided material for new bar development. There was a fair amount of algae in this reach with some areas of moss growth noted. Mean RASI values were 80 and 71 in 1993 and 1994, respectively. Fines (< 4 mm) comprised as much as 25.6 percent (mean = 20%) of the sampled substrate in 1993 and 22.3 percent (mean= 18%) in 1994 (Table 3.35).

Reach five of Alder Creek was classified as a C6 channel type with a channel bottom comprised of silt/clay and a mean stream gradient of less than 1 percent (Table 3.36). The reach extended for 1,763 meters and encompassed elevations ranging from 2,900 to 2,940 (Figure 2.4). Dominant land uses were livestock grazing and timber harvest. The riparian area consisted of mature deciduous and coniferous trees interspersed with shrubs, forbes and grasses. Average canopy cover was 18 percent for this reach in 1993 and in 1994 averaged 44 percent. Instream woody debris densities were higher than other reaches in the drainage (1.1/l 00 ft (1993) & 1.6/l 00 ft (1994)). Riffle to pool ratio was 1 :l and mean residual pool depth was 0.5 meters in 1993. In 1994, the riffle to pool ratio increased to 6.8:1 with a corresponding increase in residual pool depth 0.7 meters (Table 3.36). This reach had a channel stabilty rating of poor (Table 3.36). Upper bank slopes ranged from l-3 percent with no evidence of mass wasting associated with the floodplain. Vegetative density ranged from

Table 3.35. Summary table showing values for reach four, Alder Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2,700-2,900 ft	2,700-2,900 ft
Dominant land use	Livestock grazing	Livestock grazing
Riparian ecotype	Coniferous/deciduous mix with mature trees,shrubs, forbs and grasses	Coniferous/deciduous mature trees, shrub: forbs and grasses
Reach length	5,053 m	5,806 m
Channel type	c 3	c 3
Bankfull width	ft	•
Bankfull depth	ft	•
Width/depth ratio	> 12	•
Mean stream gradient	1.5 %	2.6 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	fair (79)	fair (90)
RASI values	83; 67; 91	69; 88; 56
% substrate < 4mm	20	18.0
mean substrate size (mm)	91	1 2 4
Mean % canopy cover	6.2 %	46.6 %
Barriers	none	none
# instream woody debris	77 (0.5 /100 ft)	116 (0.6 /100 ft)
Dominant habitat complex	riffle : pool	riffle : pool
Riffle/pool ratio	1.2: 1	2.6 : 1
Residual pool depth	0.5 m	0.5 m
Total available habitat	96,846 m^2	80,418 m^2

Table 3.36. Summary table showing values for reach five, Alder Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	4th	4th
Elevation	2, 900-2,940 ft	2,900-2,940 ft
Dominant land use	Forested/Livestock grazing	Forested/Livestock grazing
Riparian ecotype	Coniferous/deciduous mix with mature trees, shrubs, forbs and grasses	Coniferous/deciduous mix with mature trees, shrubs, forbs and grasses
Reach length	1,763 m	1,465 m
Channel type	C6	C6
Bankfull width	ft	*
Bankfull depth	ft	•
Width/depth ratio	12.5	•
Mean stream gradient	1.4 %	3.6 %
Entrenchment	slight	slight
Sinuoisity	high	high
Channel stability rating	poor (128)	poor (118)
RASI values	NA	NA
% substrate < 4mm	NA	NA
mean substrate size (mm)	NA	NA
Mean % canopy cover	17.7 %	43.7 %
Barriers	none	none
# instream woody debris	65 (1.1 /100 ft)	76 (1.6 /100 ft)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	1 : 1	6.8 : 1
Residual pool depth	0.5 m	0.7 m
Total available habitat	37,282 m^2	45,789 m^2

50-70 percent with a shallow and discontinous root mass. Due to incr^ ased beaver activity in this reach there was increased amounts of debris ja' material. There were occasional overbank flows attributable to beaver activity a. ȷ cattle use. Continuous bank cutting and erosion was observed and accompanied by accelerated bar development. Most of the channel bottom is in a yearly state of flux with minimal aquatic vegetation present.

Reach six of Alder Creek was classified as a E3b type channel (Table 3.37) with elevation beginning at 2,940 feet and rising to 3,330 feet. The reach extended for 6,630 meters (Figure 2.4). The domi: ant land use in this reach was livestock grazing and timber harvest. The riparian area consisted of mature coniferous and deciduous trees mixed with grasses and forbs. Average canopy cover in this reach was 25 percent with instream woody debris densities of 0.6/1 00 feet during 1993. In 1994, average stream canopy cover was 68 percent with instream woody debris densities of 1.51100 ft. Beaver ponds and associated downstream riffles comprised the dominant habitat complex. Riffle to pool ratio was 1:1.7 and mean residual pool depths were 0.6 meters in 1993. In 1994. riffle to pool ratio was 2.4:1 with a residual pool depth of 0.4 meters (Table 3.37). The reach had a channel stability rating of fair (Table 3.37). Upper bank slopes averaged 2 percent with no mass wasting problems evident. Debris jam potential was limited to small woody debris. Vegetative cover was provided by sha ow rooted species with a density of 50-70 percent. The channel capacity was adequate for peak flows. Bank cutting occurred at obstructions and outcurves. There was a moderate amount of new bar development, consisting of sand and pea sized gravel particles. RASI values could not be calculated in this reach due to the sand bottom.

Reach 1 of the North Fork Alder Creek was classified as an E3b type channel with elevations beginning at 2,940 feet and rising to 3,070 feet (Figure 2.4). Reach length was 1,260 meters. The channel was very sinuous (>1.5) and slightly entrenched (>2.4) and had a mean stream gradient of 3 percent (Table 3.38.). The dominant land use in this reach was livestock grazing with the riparian area consisting of forbs and grasses. Average canopy cover was 36 percent with instream woody debris densities of 0.6/100 feet. Dominant habitat complex was riffle/pool with a riffle to pool ratio of 1.3:1 during 1993. In 1994, the riffle to pool ratio shifted to 16:l. Mean residual pool depth was 0.4 meters in 1993 and decreased to 0.2 meters in 1994 (Table 3.38). Channel stability is this reach was good to fair (Table 3.38). The upper slopes averaged 3 percent with no mass wasting problems evident. Bank protection consisted of discontinuous and shallow root masses with a density of 70-90 percent. The channel capacity was adequate for existing peak flows. Some bank cutting and sloughing was observed at obstructions and outcurves. Little new bar development was observed in this reach. Rocks were slick throughout the reach from seasonal blooms of algae. Mean RASI values were 65 and 79 in 1993 and 1994,

Table 3.37. Summary table showing values for reach six, Alder Creek, 1993 and l994

PARAMETER	1993	1994
Stream order	2nd	2nd
Elevation	2,940-3,330 ft	2,940-3,330 ft
Dominant land use	Forested/Livestock grazing	Forested/Livestock grazing
Riparian ecotype	Coniferous/deciduous mix with mature trees, forbs and grasses	Coniferous/deciduous mix mature trees, forbs and grasses
Reach length	6,630 m	6,278 m
Channel type	E3b	E3b
Bankfull width	ft	*
Bankfull depth	ft	*
Width/depth ratio	4.4	•
Mean stream gradient	1 %	1.8%
Entrenchment	slight	slight
Sinuoisity	very high	very high
Channel stability rating	fair (103)	fair (80)
RASI values	NA	NA
% substrate < 4mm	NA	NA
mean substrate size (mm)	NA	NA
Mean % canopy cover	25 %	68 %
Barriers	none	none
# instream woody debris	127 (0.6 /100 ft)	307 (1.5 /100 ft)
Dominant habitat complex	beaver ponds; riffle	riffle; pool
Riffle/pool ratio	1 : 1.7	2.4 : 1
Residual pool depth	0.6 m	0.4 m
Total available habitat	161,234 m^2	73,119 m^2

Table 3.38. Summary table showing values for reach one, North Fork Alder Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	2nd	2nd
Elevation	2,940-3,070 ft	2,940-3,070 ft
Dominant land use	Livestock grazing	Livestock grazing
Riparian ecotype	Conferous / decidous mix with forbs and grasses	Coniferous/Decidous mix with forbs and grasses
Reach length	1,260 m	1,677 m
Channel type	E3b	E3b
Bankfull width	ft	•
Bankfull depth	ft	•
Width/depth ratio	4..6	•
Mean stream gradient	3 %	3.1 %
Entrenchment	slight	slight
Sinuoisity	very high	very high
Channel stability rating	good (73)	fair (91)
RASI values	55; 79; 51	64; 43
% substrate < 4mm	22 %	29.9 %
mean substrate size (mm)	53	103
Mean % canopy cover	36.3 %	8%
Barriers	none	none
# instream woody debris	24 (0.6 /100 ft)	22 (0.4 /100 ft)
Dominant habitat complex	riffle - pool	riffle - pool
Riffle/pool ratio	1.3 :l	16: 1
Residual pool depth	0.4 m	0.2 m
Total available habitat	11,206 m^2	5,651 m^2

respectively. Fine sediment (< 4 mm) comprised 22 percent of the sampled substrate in 1993, and 30 percent in 1994 (Table 3.38).

Reach two (comprising stream reaches 2a and 3a) of North Fork Alder Creek were classified as B3a type channels with isolated areas having characteristics of D3b type channels (Table 3.39). Reach length was 3,461 meters with elevations ranging from 3,070 to 3,280 feet (Figure 2.4). The dominant land type in this reach was forested wetland with the riparian area composed of mature coniferous and decidous trees interspersed with large shrubs. Average canopy cover in this reach was 30 percent with instream woody debris densities of 0.4/l 00 feet during 1993. In 1994, average canopy cover was 87 percent with instream woody debris loads of 4.8/l 00 feet. Dominant habitat complex was beaver pond/riffle with a riffle to pool ratio of 1 :1.6. Mean residual pool depth was 0.4 meters (Table 3.39). The channel stability in these reaches was fair (Table 3.39). The upper bank slopes averaged 5 percent with no mass wasting problems evident. Plant density was approximately 70 percent with some deep rooted species interspersed throughout the reach. Channel capacity was adequating for exisiting peak flows, but due to beaver activity there was evidence of some overbank flows. Frequent obstructions created sediment traps throughout the reach and bank cutting was significant. Some new gravel bar development had occurred with slight amounts of fines being deposited. Clinging aquatic vegetation was common even in swift waters. One RASI survey site was sampled in reach 2a in 1994. The RASI value was 69.3 and fine sediment (< 4 mm) comprised 36 percent of the sampled substrate (Table 3.39). Mean RASI values for reach 3a were 71 and 52 in 1993 and 1994, respectively. Fine sediment in reach 3a comprised between 26 and 30 percent of the sampled substrate on average.

Reach three of North Fork Alder Creek was classified as a B3a type channel with elevations beginning at 3,280 feet and rising to 3,620 feet. Reach length was 3,130 meters (Figure 2.4). The dominant land type within this reach was forested with the riparian area consisting of young and mature coniferous and deciduous trees interspersed with shrubs. Average canopy cover was 39 percent with instream woody debris densities of 0.4/l 00 feet. Dominant habitat complex was riffle/pool with a riffle to pool ratio of 2.3:1. Mean residual pool depth was 0.2 meters. Channel stability was rated as fair to good (Table 3.40). Upper bank slopes ranged from 2-30 percent with no evidence of mass wasting problems. Plant density in this reach was at least 90 percent with a vigorous community of both shallow and deep rooted species. There were large amounts of debris jam material located throughout the reach. Channel capacity was adequate for existing peak flows. Bank cutting occurred at outcurves with little new bar development observed. Clinging aquatic vegetation was abundant throughout the reach with both algae and moss present. The mean RASI value

Table 3.39. Summary table showing values for reach two, North Fork Alder Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	2nd	2nd
Elevation	3,070-3,280 ft	3,070-3,280 ft
Dominant land use	Forested	Forested
Riparian ecotype	Coniferous/decidous mix with mature trees & shrubs	Coniferous/decidous mix with mature trees & shrubs
Reach length	3,461 m	4,250 m
Channel type	B3a - D3b	B3a - D3b
Bankfull width	ft	*
Bankfull depth	ft	•
Width/depth ratio	> 40 , 5.6	*
Mean stream gradient	2.5 %	8.7 %
Entrenchment	moderate	moderate
Sinuoisity	moderate	moderate
Channel stability rating	fair (78)	fair (86)
RASI values	66; 77	46; 66; 46
% substrate < 4mm	29.5 %	25.7 %
mean substrate size (mm)	46	47
Mean % canopy cover	35.2 %	87.2 %
Barriers	none	none (gradient)
# instream woody debris	46 (0.4 /IOO ft)	663 (4.8 /100 ft)
Dominant habitat complex	beaver pond - riffle	riffle - beaver pond
Riffle/pool ratio	1 : 1.6	1:I
Residual pool depth	0.4 m	0.5 m
Total available habitat	99,826 m^2	69.288 ft^2

Table 3.40. Summary table showing values for reach three, North Fork Alder Creek, 1993 and 1994

PARAMETER	1993	1994
Stream order	2nd	
Elevation	3,280-3,620 ft	
Dominant land use	Forested	
Riparian ecotype	Coniferous/decidous mix with mature, young trees, & shrubs	
Reach length	3,130 m	
Channel type .	B3a	
Bankfull width	ft	•
Bankfull depth	ft	•
Width/depth ratio	6	*
Mean stream gradient	5 %	
Entrenchment	moderate	
Sinuoisity	moderate	
Channel stability rating	0	
RASI values	45; 40; 38	*
% substrate < 4mm	19.6	*
mean substrate size (mm)	39	•
Mean % canopy cover	39 %	•
Barriers	none	
# instream woody debris	476 (0.4 /lOO ft)	
Dominant habitat complex	riffle - pool	
Riffle/pool ratio	2.3 : 1	
Residual pool depth	0.2 m	
Total available habitat	4,682 m^2	

was 41 in 1993 and fine sediment (< 4 mm) comprised between 15 and 22 percent (mean=20 percent) of the sampled substrate (Table 3.40).

3.2. BIOLOGICAL EVALUATION

3.2.1. Relative Abundance

3.2.1.1. 1993 Lake, Benewah, Evans, and Alder Creeks

In May, June, July, August, and October of 1993, a total of 15.8 electroshocking hours were spent collecting relative abundance information. A total of 1,625 fish were collected from Lake, Benewah, Evans, and Alder creeks (Table 3.41). In Lake Creek, a total of 257 fish were captured with sculpin *spp.* being the most abundant at 40.1 percent. In Benewah Creek, 700 fish were captured with redside shiners comprising 45.9 percent of the total catch. In Evans Creek, a total of 386 fish were captured with cutthroat trout the most abundant at 53.4 percent. A total of 293 fish were captured in Alder Creek, with sculpin *spp.* being the most abundant at 34.5 percent. Cutthroat trout densities were highest in Evans Creek at 53.4 percent followed by, Alder (22.5 percent), Lake (16.0 percent) and Benewah creeks (11 .O percent) (Table 3.42). Relative abundance data for each month, reach, and stream can be found in Appendix E.

Lake Creek

In spring, summer, and fall a total of three, one hundred seventy-two, and seventy fish were collected in Lake Creek, respectively (Table 3.43). No trout species were collected in the spring sample (Table 3.43). Of the 172 fish captured in the summer, thirty (17.4 percent) were cutthroat trout, with the remaining 82 percent being comprised of sculpin *spp,* longnose date, longnose sucker, and redside shiner (Table 3.44). Of the thirty cutthroat trout captured in the summer, two were 0+ of age, three were I+ and 2+ years of age, respectively. Ten were 3+ years of age, ten were 4+ years of age and two were 5+ years of age (Table 3.45). During Fall, eleven (15.7 percent) were cutthroat trout and one (1.4 percent) was a bull trout. The remaining 82.8 percent were comprised of sculpin *spp,* and longnose suckers. Of the eleven cutthroat captured in the fall, two were I+ years of age, four were 2+ years of age, two cutthroat trout were 3+ years of age, respectively. Two cutthroat trout 4+ years of age and one was 5+ years of age (Table 3.45).

Benewah Creek

In spring, summer and fall a total of two hundred eighty-six, three hundred thirty-one, and eighty-five fish were collected from Benewah Creek, respectively (Table 3.46). Of the 286 fish collected in spring, thirty-six (12.6 percent) were

Table 3.41. **Number of each species of fish caught by electrofishing at each Coeur d'Alene tributary during 1993.**

Tributary	**Lake**	**Benewah**	**Evans**	**Alder**
Shock time (hours)	**2.7**	5.3	3.9	3.9
Species				
Cutthroat trout	41	77	206	66
Eastern brook trout		1		87
Bull trout	1			
Rainbow trout		2		
Sculpin spp.	103	49	176	101
Largemouth bass		2		
Longnosesucker	48	128	3	32
Longnosedace	51	73		4
Western speckled dace	1	36		
Brown bullhead		2		3
Redside shiner	12	321		
Northern squawfish		8		
Fumpkinseed		1	1	
TOTAL	257	700	386	293

Table 3.42. Percent (%) of each species of fish caught by electrofishing at each Coeur d'Alene tributary during 1993.

Species	**Lake**	**Benewah**	**Evans**	**Alder**
Cutthroat trout	16.0	11.0	53.4	22.5
Eastern brook trout		0.1		29.7
Bull trout	0.4			
Rainbow trout		0.3		
Sculpin spp.	40.1	7.0	45.6	34.5
Largemouth bass		0.3		
Longnose sucker	18.7	18.3	0.8	10.9
Lonanose dace	19.8	10.4		1.4
Western speckled dace	0.4	5.1		
Brown bullhead		0.3		1.0
Redside shiner	4.7	45.9		
Northern squawfish		1.1		
Pumpkinseed	0.1		0.3	

Table 3.43. Number of each species of fish caught by electrofishing in Lake Creek during May - October, 1993.

Species	Spring (May-June)	Summer (July-August)	September (October)
Shock time (min)	12.4	88.4	58.6
Cutthroat trout		30	11
Bull trout			1
Sculpin spp.	2	58	43
Longnose sucker		33	15
Longnosedace		39	
Western speckled dace	1		
Redside shiner		12	
TOTAL	3	172	70

Table 3.44. Percent (%) of each species of fish caught by electrofishing in Lake Creek during May - October, 1993.

Species	Spring (May-June)	Summer (July-August)	Fall (October)
Cutthroat trout		17.4	15.7
Bull trout			1.4
Largemouth bass			
Sculpin *spp.*	66.7	33.7	61.4
Longnose sucker		19.2	21.4
Longnose dace		22.7	
Western speckled dace	33.3		
Redside shiner		7.0	

Table 3.45. Electrofishing relative abundance for salmonid species by age class in Lake Creek, 1993.

		Cutthroat trout	
Age	Spring	Summer	Fall
0+	0	2	0
1+	0	3	2
2+	0	3	4
3+	0	10	2
4+	0	10	2
5+	2	2	1
6+	2	30	11

Table 3.46. Number of each species of fish caught by electrofishing in Benewah Creek during May - October, 1993.

Species	Spring (May-June)	Summer (July-August)	Fall (October)
Shock time (min)	129.7	124.3	NA
Cutthroat trout	36	22	19
Rainbow trout			2
Eastern brook trout			1
Sculpin *spp.*	9	18	22
Long nose sucker	48	60	20
Longnosedace	12	61	
Western speckled dace	16	20	
Northern sauawfish	6	2	
Largemouth bass			2
Redside shiner	158	144	19
Pumpkinseed		3	
Brown bullhead	1	1	
TOTAL	286	331	85

cutthroat trout, one hundred fifty-eight (55.2 percent) were redside shiners, and forty-eight (16.8 percent) were longnose sucker. The other 15.3 percent consisted of western speckled dace, longnose dace, sculpin *spp,* northern squawfish and brown bullhead (Table 3.47). Of the thirty-six cutthroat captured, four were 0+ years of age, eleven were 1+ years of age, nine were 2+ years of age, six were 3+ years of age, two were 4+ years of age, one was 5+ years of age, and four were 6+ years of age. (Table 3.48). Of the 331 fish captured in summer 22 (6.6 percent) were cutthroat trout, 144 (43.5 percent) were redside shiner, sixty-one (18.4 percent) were longnose dace, sixty (18.1 percent) were longnose sucker. The other 7.2 percent consisted of sculpin *spp,* brown bullhead, northern squawfish and pumpkinseed. Of the 22 cutthroat captured; one was 0+ and 1+ years of age, respectively, nine were 2+ years of age, five were 3+ years of age, four were 4+ years of age, one was 5+ years of age and one was 6+ years of age. Of the 85 fish collected from Benewah Creek in the fall, nineteen (22.4 percent) were cutthroat trout, twenty-two (25.9 percent) were scuplin *spp,* twenty (23.5 percent) were longnose sucker, nineteen (22.4 percent) were redside shiner. The other six percent consisted of largemouth bass, rainbow trout, and eastern brook trout. Of the nineteen cutthroat trout captured in the fall one was 2+ years of age, eight were 3+ years of age, seven were 4+ years of age, two were 5+ years of age, and one was 6+ years of age (Table 3.48).

Table 3.47. Percent (%) of each species of fish caught by electrofishing in Benewah Creek during May - October, 1993.

Species	Spring (May-June)	Summer (July-August)	Fall (October)
Cutthroat trout	12.6	6.6	22.4
Rainbow trout			2.4
Eastern brook trout			1.2
Sculpin *spp.*	3.1	5.4	25.9
Longnose sucker	16.8	18.1	23.5
Longnosedace	4.2	18.4	
Western speckled dace	5.6	6.0	
Northern squawfish	2.1	0.6	
Largemouth bass			2.4
Redside shiner	55.2	43.5	22.4
Pumpkinseed		0.3	
Brown bullhead	0.3	0.9	

Table 3.48. Electrofishing relative abundance for salmonid species by age class in Benewah Creek, 1993.

		Cutthroat trout	
Age	Spring	Summer	Fall
0+	4	1	0
1+	11	1	0
2+	9	9	1
3+	6	5	8
4+	2	4	7
5+	1	1	2
6+	4	1	1

Evans Creek

A total of seven, two hundred sixty-two, and one hundred sixteen fish were captured in Evans Creek during spring, summer, and fall, respectively (Table 3.49). Twenty-nine percent of the fish caught in the spring were cutthroat trout and the remaining 71 percent were sculpin *spp.* (Table 3.50). Of the 2 cutthroat trout captured in spring, one was 1+ years of age and one was 2+ years of age (Table 3.51) In summer, 135 (51.5 percent) of the fish collected were cutthroat trout, with the remainder being sculpin species, longnose sucker and pumpkinseed. Of the one hundred thirty-five cutthroat, nine were 0+ years of age, thirty were 1+ years of age, 30 were 2+ years of age, twenty-six were 3+

years of age, twenty-seven were 4+ years of age, seven were 5+ years of age and six were 6+ years of age (Table 3.51). Of the one hundred sixteen fish collected from Evans Creek in the fall sample, 69 (59.5 percent) were cutthroat trout, and 47 (40.5 percent) were sculpin species (Table 3.50). Of the sixty-nine fish captured in Evans during the fall, six were 1+ years of age, twenty-three were 2+ years of age, eighteen were 3+ years of age, twelve were 4+ years of age, five were 5+ years of age, and five were 6+ years of age (Table 3.51).

Table 3.49. Number of each species of fish caught by electrofishing in Evans Creek during May - October, 1993.

Species	Spring (May-June)	Summer (July-August)	September (October)
Shock time (min)	49.4	117.2	74.0
Cutthroat trout	2	135	69
Sculpin *spp.*	5	124	47
Longnose sucker		3	
Pumpkinseed		1	
TOTAL	7	262	176

Table 3.50. Percent (%) of each species of fish caught by electrofishing in Evans Creek during May - October, 1993.

Species	Spring (May-June)	Summer (July-August)	Fall (October)
Cutthroat trout	28.6	51.5	59.5
Sculpin *spp.*	71.4	47.3	40.5
Longnose sucker		1.1	
Pumpkinseed		0.4	

Alder Creek

A total of forty-three, one hundred eighty-nine, and sixty-one fish were captured in Alder Creek in spring, summer and fall, respectively (Table 3.52). Of the forty-three fish collected in the spring sample, 25.6 percent were eastern brook trout, 18.6 percent were cutthroat trout and the remaining 55.8 percent were sculpin species, longnose sucker, brown bullhead, and longnose dace (Table 3.53). Of the eight cutthroat trout captured in Alder Creek during spring, five were 2+ years of age, one was 3+ years of age, one was 4+ years of age and one was 5+ years of age (Table 3.54). Of the one hundred eighty-nine fish

Table 3.51. Electrofishing relative abundance for salmonid species by age class in Evans Creek, 1993.

	Cutthroat trout		
Age	Spring	Summer	Fall
0+	0	9	0
1+	1	30	6
2+	1	30	23
3	0	26	18
4	0	27	12
5+	0	7	5
6+	0	6	5

captured from Alder Creek in July, 22.2 percent were cutthroat trout, 28.0 percent were eastern brook trout and the remaining 49.8 percent were sculpin species, longnose sucker, and longnose dace. Of the forty-two cutthroat trout captured in the summer, two were 1+ years of age, seven were 2+ years of age, thirteen were 3+ years of age, ten were 4+ years of age, eight were 5+ years of age, and two were 6+ years of age (Table 3.54). In the fall sample, sixty-one fish were collected in Alder Creek. Of those sixty-one fish, twenty-three (37.7 percent) were eastern brook trout, sixteen (26.2 percent) were cutthroat trout and sculpin species, respectively, and six (9.8 percent) were longnose sucker (Table 3.53). Of the sixteen cutthroat trout captured, one was 1+ years of age, one was 2+ years of age, five were 3+ years of age, four were 4+ years of age and six were 5+ years of age (Table 3.54).

Table 3.52. Number of each species of fish caught by electrofishing in Alder Creek during May - October, 1993.

Species	Spring (May-June)	Summer (July-August)	September (October)
Shock time (min)	54.6	120.6	58.0
Cutthroat trout	8	42	16
Eastern brook trout	11	53	23
Sculpin spp.	14	71	16
Longnose sucker	5	21	6
Redside shiner			
Longnosedace	2	2	
Brown bullhead	3		
TOTAL	43	189	61

Table 3.53. Percent (%) of each species of fish caught by electrofishing in Alder Creek during May - October, 1993.

Species	Spring (May-June)	Summer (July-August)	Fall (October)
Cutthroat trout	18.6	22.2	26.2
Eastern brook trout	25.6	28.0	37.7
Sculpin *spp.*	32.6	37.6	26.2
Longnose sucker	11.6	11.1	9.8
Longnosedace	4.7	1.1	
Brown bullhead	7.0		

Table 3.54. Electrofishing relative abundance for salmonid species by age class in Alder Creek, 1993.

		Cutthroat trout	
Age	Spring	Summer	Fall
0+	0	0	0
1+	0	2	1
2+	5	7	1
3+	1	13	5
4+	1	10	4
5+	1	8	6
6+	0	2	0

3.2.1.2. 1994 Lake, Benewah, Evans, and Alder Creeks

In May, June, July, August, and October of 1994, a total of 6.7 electroshocking hours were spent collecting relative abundance information. A total of 1,370 fish were collected from the four tributaries (Table 3.53). In Lake Creek, a total of two hundred twenty-four fish were captured with sculpin *spp* being the most abundant at 37.1 percent. In Benewah Creek, six hundred fifty-nine fish were captured with redside shiners comprising 72.2 percent of the total catch. In Evans Creek, a total of one hundred seventy-eight fish were captured with sculpin *spp.* the most abundant at 47.8 percent. A total of three hundred nine fish were captured in Alder Creek, with eastern brook trout the most abundant at 42.1 percent. Cutthroat trout densities were highest in Evans Creek at 43.3 percent followed by Alder (23.3 percent), Lake (15.2 percent) and Benewah (2.8 percent). Relative abundance data for each month, reach and stream can be found in Appendix E.

Table 3.55. Number of each species of fish caught by electrofishing at each Coeur d'Alene tributary during 1994.

Species	Lake	Benewah	Evans	Alder
Shock time (hours)	**1.54**	**1.04**	**1.60**	**2.54**
Cutthroat trout	34	18	77	72
Eastern brook trout				130
Sculpin spp.	83	71	85	87
Largemouth bass			5	
Longnose sucker	54	87	4	20
Western speckled dace		4		
Brown bullhead			1	
Redside shiner	49	459	6	
Northern squawfish				
TOTAL	224	659	178	309

Table 3.56. Percent of each species of fish caught by electrofishing at each Coeur d'Alene tributary during 1994

Species	Lake	Benewah	Evans	Alder
Cutthroat trout	15.2	2.8	43.3	23.3
Eastern brook trout				42.1
Sculpin spp.	37.1	11.2	47.8	28.2
Largemouth bass			2.8	
Longnose sucker	24.1	13.7	2.2	6.5
Western speckled dace		1.8		
Brown bullhead			0.6	
Redside shiner	21.9	72.2	3.4	
Northern squawfish		0.2		

Lake Creek

In spring, summer, and fall a total of fifty-three, fifty-five, and one hundred sixteen fish were collected in Lake Creek, respectively (Table 3.55). Cutthroat trout comprised 15 percent of the spring sample. The remaining 85 percent of the catch was comprised of sculpin *spp,* longnose sucker and redside shriners. Of the eight cutthroat captured, seven were 2+ fish and one was a 1+ fish (Table 3.57). Of the fifty-five fish collected in the summer sample, 32.7 percent of the catch were cutthroat trout. The remaining 67.3 percent were comprised of sculpin, longnose sucker, redside shiner and western speckled dace (Table 3.56). All eighteen trout captured were 0+ of age (Table 3.57). Of the one hundred sixteen fish captured during the fall sample, 6.9 percent were cutthroat trout. Sculpin *spp.,* longnose sucker, and redside shriner comprised the remaining 93 percent. Of the eight cutthroat captured, five were 0+ of age and three were 1+ of age.

Table 3.57. Number of each species of fish caught by electrofishing in Lake Creek during May - October, 1994.

Species	Spring (May-June)	Summer (July-August)	September (October)
Shock time (min)	25.7	29.6	37.2
Cutthroat trout	8	18	8
Sculpin spp.	32	10	41
Longnose sucker	11	14	29
Redside shiner	2	9	38
Western speckled dace		*4*	
TOTAL	*53*	*55*	*116*

Table 3.58. Percent (%) of each species of fish caught by electrofishing in Lake Creek during May - October, 1994.

Species	Spring (May-June)	Summer (July-August)	Fall (October)
Cutthroat trout	15.1	32.7	6.9
Sculpin *spp.*	*60.4*	18.2	35.3
Longnose sucker	*20.8*	*25.4*	*25.0*
Redside shiner	*3.8*	16.4	*32.8*
Western speckled dace		*7.3*	

Table 3.59. Electrofishing relative abundance for salmonid species by age class in Lake Creek, 1994.

	Cutthroat trout		
Age	Spring	Summer	Fall
0+	0	18	5
1+	1	0	3
2+	7	0	0

Benewah Creek

In Benewah Creek, ninty-five, one hundred fifty-nine, and three hundred eighty-two fish were collected during the spring, summer and fall sample, respectively (Table 3.60). Cutthroat trout comprised 13.7 percent of the spring catch, while the remaining 86 percent was made up of sculpin *spp.,* longnose sucker, northern squawfish and redside shiner. Of the twelve cutthroat captured, five were 1+ of age, three were 2+ of age, one was 3+ and 5+ of age and two were 6+ of age (Table 3.62). In the summer sample, cutthroat trout comprised 0.6 percent of the catch. Redside shiner, longnose sucker and sculpin spp. made up the remainder of the catch. The one cutthroat trout captured in the summer sample was 2+ years of age. In the fall sample, cutthroat trout comprised 1 percent of the catch with the remainder being sculpin *spp.,* longnose sucker and redside shiner. All four cutthroat trout captured were 2+ years of age (Table 3.62).

Table 3.60. Number of each species of fish caught by electrofishing in Benewah Creek during May - October, 1994

Species	Spring (May-June)	Summer (July-August)	Fall (October)
Shock time (min)	40.1	26.3	62.4
Cutthroat trout	13	1	4
Sculpin *spp.*	17	21	33
Longnose sucker	46	6	35
Northern squawfish	1		
Redside shiner	18	131	310
TOTAL	95	159	382

Table 3.61. Percent of each species of fish caught by electrofishing in Benewah Creek during May - October, 1994.

Species	Spring (May-June)	Summer (July-August)	Fall (October)
Cutthroat trout	13.7	0.6	1.0
Sculpin *spp.*	17.9	13.2	8.6
Longnose sucker	48.4	3.8	9.2
Northern squawfish	1.1		
Redside shiner	18.9	82.4	81.2

Table 3.62. Electrofishing relative abundance for salmonid species by age class in Benewah Creek, 1994.

	Cutthroat trout		
Age	Spring	Summer	Fall
1+	5	0	0
2+	3	1	4
3+	1	0	0
5+	1	0	0
6+	2	0	0

Evans Creek

In Evans Creek, sixty-three, fifty-eight, and fifty-seven fish were collected during the spring, summer and fall sample. Cutthroat trout comprised 50.8 percent of the catch during the spring sample while sculpins comprised the other 49.2 percent (Table 3.63) Of the thirty-two cutthroat trout captured, one was 0+ of age, nine were 1+ of age, fifteen were 2+ of age, six were 3+ of age and one was 4+ of age (Table 3.65). In the summer sample, cutthroat trout comprised 31 percent of the catch with sculpin *spp.,* longnose sucker, redside shiner and brown bullhead comprising the remainder of the catch. Of the twenty-one cutthroat captured, one was 0+ of age, eight were 1+ of age, seven were 2+ of age and five were 3+ of age. Cutthroat trout comprised 47 percent of the fall catch, while sculpin and largemouth bass comprised the remainder. Of the thirty cutthroat trout collected, three were 0+ years of age, sixteen were 1+ years of age, four were 2+ years of age, six were 3+ years of age, and one was 4+ years of age (Table 3.65).

Table 3.63. Number of each species of fish caught by electrofishing in Evans Creek during May - October, 1994.

Species Shock time (min)	Spring (May-June) 34.9	Summer (July-August) 22.7	September (October) 38.6
Cutthroat trout	32	18	27
Sculpin *spp.*	31	29	25
Longnose sucker		4	
Redside shriner		6	
Brown bullhead		1	
Largemouth bass			5
TOTAL	63	58	57

Table 3.64. Percent (%) of each species of fish caught by electrofishing in Evans Creek during May - October, 1994.

Species	Spring (May-June)	Summer (July-August)	Fall (October)
Cutthroat trout	50.8	31.0	47.4
Sculpin *spp.*	49.2	50.0	43.8
Longnose sucker		6.9	
Redside shiner		10.3	
Brown bullhead		1.7	
Largemouth bass			8.8

Table 3.65. Electrofishing relative abundance for salmonid species by age class in Evans Creek, 1994.

	Cutthroat trout		
Age	Spring	Summer	Fall
0+	1	1	3
1+	9	8	16
2+	15	7	4
3+	6	5	6
4+	1	0	1

Alder Creek

During the spring, summer, and fall sampling in Alder Creek, sixty-six, one hundred twenty-five, and one hundred eighteen fish were captured (Table 3.66). Cutthroat trout and eastern brook trout comprised 24.2 percent and 42.4 percent of the catch during the spring sample. Other species captured included sculpin and longnose sucker (Table 3.66). Of the sixteen cutthroat trout collected, one was 1+ years of age, twelve were 2+ years of age, and three were 3+ years of age. Of the twenty-eight eastern brook trout collected, eight were 2+ years of age, twelve were 3+ years of age and eight were 4+ years of age (Table 3.68). In the summer sample cutthroat trout comprised 20.8 percent of the catch and eastern brook trout comprised 48.8 percent of the catch. Sculpin *spp.* and longnose sucker comprised the remainder of the catch (Table 3.66). Of the twenty-six cutthroat trout collected, five were 1+ years of age, twelve were 2+ years of age, seven were 3+ years of age and two were 4+ years of age. Of the sixty-one eastern brook trout collected, eighteen were 1+ years of age, seventeen were 2+ years of age, fourteen were 3+ years of age and twelve were 4+ years of age (Table 3.68). In the fall sample cutthroat and eastern brook trout comprised 60 percent of the catch, while sculpin *spp.* comprised the remainder

(Table 3.67). Seven of the thirty cutthroat trout collected were 1+ years of age, fifteen were 2+ years of age, four were 3+ and 4+ years of age (Table 3.68). Of the forty-one eastern brook trout collected, eight were 1+ years of age, seventeen were 2+ years of age, fifteen were 3+ years of age and one was 4+ years of age (Table 3.68).

Table 3.66. Number of each species of fish caught by electrofishing in Alder Creek during May - October, 1994.

Species	Spring (May-June)	Summer (July-August)	September (October)
Shock time (min)	38.3	43.6	70.6
Cutthroat trout	16	26	30
Eastern brook trout	28	61	41
Sculpin spp.	14	26	47
Lonanose sucker	8	12	
TOTAL	*66*	125	118

Table 3.67. Percent (%) of each species of fish caught by electrofishing in Alder Creek during May - October, 1994.

Species	Spring (May-June)	Summer (July-August)	Fall (October)
Cutthroat trout	24.2	20.8	25.4
Eastern brook trout	42.4	48.8	34.7
Sculpin sm.	21.2	20.8	39.8
Longnose sucker	12.1	9.6	

Table 3.68. **Electrofishing relative abundance for salmonid species by age class in Alder Creek, 1994.**

		Cutthroat trout	
Age	**Spring**	**Summer**	**Fall**
1+	1	5	7
2+	12	12	15
3+	3	7	4
4+	0	2	4
		Eastern brook trout	
Age	**Spring**	**Summer**	**Fall**
1+	0	18	8
2+	8	17	17
3+	12	14	15
4+	8	12	1

3.2.2. Trout Population and Biomass Estimates by Habitat Type

A total of 3,490 fish were caught during electrofishing surveys conducted in October, 1993. Approximately 29 percent of the catch was comprised of trout (n cutthroat= 600; n brook= 416). Population and biomass estimates for each study drainage are summarized below by reach and habitat type.

3.2.2.1. Lake Creek

Cutthroat trout populations in the Lake Creek drainage were estimated at 1,457 fish with a total biomass of 57 pounds and a mean density of 2.6 trout/100 m^2 (Table 3.69). Adult fish (4+ and older) were not represented in the population estimate. Estimated cutthroat trout densities by reach ranged from 0.3-18.2/100 m^2, with the highest densities found in reach 1 of West Fork Lake Creek. The lowest trout densities were found in mainstem reaches 6 and 7. Density estimates by habitat type ranged from 0.2-128.2/100 m^2 (Table 3.70). Cutthroat trout densities were greatest in plunge pool habitat and lowest in dammed pool and glide habitats. Total estimated biomass was greatest in low gradient riffles, which comprised 37 percent of the total habitat.

3.2.2.2. Benewah Creek

Total trout population in the Benewah Creek drainage was estimated at 1,637 fish, with cutthroat (53 percent) and brook trout (47 percent) present in almost equal proportions (Table 3.71 & 3.73). Total cutthroat trout biomass was estimated at 77.2 pounds, with adults accounting for 29 percent of the total. Total estimated brook trout biomass was considerably greater (110.4 pounds), due to a relatively higher proportion of adults in the population. Cutthroat trout

Table 3.69 Estimates of cutthroat trout abundance and biomass by reach. 1993.

TRIBUTARY/SPECIES	REACH	LENGTH (ft.)	POP. EST.(N)	SE(N)	#I1 00 ft.	BIOMASS (lbs)	
						JUVENILES	ADULTS
LAKE CREEK/CTT	2	E5550	50.0	00	0.9	7.5	0.0
	3	3060	30.0	0:0	1.0	5.2	0.0
	4	5890	90.0	0.0	1.5	5.1	0.0
	5	3090	50.0	0.0	1.6	4.8	0.0
	6	19920	50.0	0.0	0.3	5.5	0.0
	7	1890	10.0	0.0	0.5	0.8	0.0
	WFI	2860	520.5	70.9	18.2	17.0	0.0
	VW2	11570	474.0	41.8	4.1	7.6	0.0
	BOZI	1840	182.9	34.8	9.9	3.6	0.0
TOTALS		55670	1457.4	147.5	2.6	57.0	0.0

Table 3.70 Estimates of cutthroat trout abundance and biomass by habitat type, 1993.

TRIBUTARY/SPECIES	HABITAT TYPE	LENGTH (ft.)	POP. EST.(N)	SE(N)	#/100 ft.	BIOMASS (lbs)	
						JUVENILES	ADULTS
LAKE CREEK/CTT	DMP/BVP	2820	10.0	0.0	0.4	1.1	0.0
	GLD	12920	70.0	0.0	0.5	5.4	0.0
	LGR	20610	504.3	77.6	2.4	18.7	0.0
	PKW	2400	163.3	7.8	6.8	3.2	0.0
	PLP	410	277.0	22.8	67.6	7.6	0.0
	RPD	2000	135.0	26.0	6.8	2.7	0.0
	SCH	450	20.0	0.0	4.4	2.6	0.0
	SCP	2620	80.0	0.0	3.1	11.1	0.0
	SPC	11440	197.8	26.5	1.7	4.5	0.0
TOTALS		**55670**	**1457.4**	**160.7**	**2.6**	**57.0**	**0.0**

Table 3.71 Estimates of cutthroat **trout** abundance and biomass by **reach,** 1993.

TRIBUTARY/SPECIES	REACH	LENGTH (ft.)	POP. EST.(N)	SE(N)	#/100 ft.	BIOMASS (lbs) JUVENILES	ADULTS
BENEWAH CREEK/CTT	1	13980	192	22.1	1.4	14.31	7.1
	2	11110	100	0.01	0.91	6.6	3.61
	3	3920	30	0.0	0.81	3.51	0.0
	4	4100	70	0.0	[illegible]	7.0	0.0
	5	5190	30	0.0	1.7	1.8	4.4
	6	7520	40	0.01	0.5	2.4	0.0
	7	14600	80	0.0	0.5	3.6	3.5
	a	10120	20	0.0	0.2	1.3	0.0
	9	3660	10	0 0	0.3	0.0	0.0
	10	6240	70	0.0	1.1	2.5	4.0
	11	6830	30	0.0	0.4	2.4	0.0
	12	3630	30	0.0	[illegible]	2.4	0.0
	13	3070	173	9.9	5.6	6.5	0.0
TOTALS		93970	875	32.1	0.9	64.5	22.7

Table 3.72 Estimates of cutthroat trout abundance and biomass by habitat type, 1993.

TRIBUTARY/SPECIES	HABITAT TYPE	LENGTH (ft.)	POP. EST.(N)	SE(N)	#/100 ft.	BIOMASS (lbs) JUVENILES	ADULTS
BENEWAH CREEK/CTT	DMP/BVP	4320	0	0.0	0.0	0.0	0.0
	GLD	15860	90	0.0	0.61	4.8	3.7
	LGR	45800	273	9.9	0.6	15.31	3.5
	PKW	11750	110	21.2	0.9	9.3	0.0
	PLP	1200	60	0.0	5.0	3.0	7.4
	SCP	5410	140	0.0	2.6	8.9	4.4
	SPC	9630	202	6.3	2.1	13.2	3.6
TOTALS		93970	875	37.5	0.9	64.5	22.7

Table 3.73 Estimates of brook trout abundance and biomass by reach, 1993.

TRIBUTARY/SPECIES	REACH	LENGTH (ft.)	POP. EST.(N)	SE(N)	#/100 ft.	BIOMASS (lbs)	
						JUVENILES	ADULTS
BENEWAH CREEK/EBT	1	13980	0	0.0	0.0	0.0	0.0
	2	11110	0	0.0	0.0	0.0	0.0
	3	3920	0	0.0	0.0	0.0	0.0
	4	4100	0	0.0	0.0	0.0	0.0
	5	5190	0	0.0	0.0	0.0	0.0
	6	7520	0	0.0	0.0	0.0	0.0
	7	14600	30	0.0	0.2	2.2	0.0
	8	10120	20	0.0	0.2	0.0	9.9
	9	3660	20	0.0	0.5	0.0	9.3
	10	6240	30	0.0	0.5	2.0	5.5
	11	6830	362	18.4	5.3	27.0	17.3
	12	3630	190	0.0	5.2	14.4	13.6
	13	3070	110	0.0	3.6	5.9	3.1
TOTALS		93970	762	18.4	0.8	51.6	58.8

Table 3.74 Estimates of brook trout abundance and biomass by habitat type, 1993.

TRIBUTARY/SPECIES	HABITAT TYPE	LENGTH (ft.)	POP. EST.(N)	SE(N)	#/100 ft.	BIOMASS (lbs)	
						JUVENILES	ADULTS
BENEWAH CREEK/EBT	DMP/BVP	43:20				2.6	4.2
	GLD	15860	2950	10.4	1.21	26.7	3.7
	LGR	45800	170	0	0.41	6.71	24.91
	PKW	11750	0	0.0	0.0	0.0	0.0
	PLP	1200	20	0	1.7	0.1	3.1
	SCP	5410	220	0	4.1	14.8	22.9
	SPC	9630	10	0	0.1	0.7	0.0
TOTALS		93970	762	18.4	0.8	51.6	58.8

were distributed in fairly even numbers throughout the drainage, with the highest densities occurring in reach 13 (8.0 trout/l 00 m'). Cutthroat trout biomass, however, was disproportionately higher in the lower reaches (55 percent of total in reaches l-4). The highest estimates of cutthroat trout density and biomass occurred in plunge pool habitat (4.5 fish/l00 m2 and 0.78 lbs./lOO m^2). Brook trout were only found in reaches 7-13, with the highest densities occurring in the uppermost reaches (table 3.73 & 3.74). Brook trout were found in the highest densities in scour pool habitat (2.2 fish/l00 m^2).

3.2.2.3. Evans Creek

Cutthroat trout populations in the Evans Creek drainage were estimated at 2,480 fish with a total biomass of 151 pounds and a mean density of 4.7 trout/l 00 m^2 (Table 3.75). Biomass of juvenile fish was 3.7 times greater than adult biomass. Estimated cutthroat trout densities by reach ranged from 0.0-7.3/100 m^2. Density estimates were generally higher in the lower reaches of the drainage. Density estimates by habitat type ranged from O.O-24.8/100 m^2 (Table 3.76). Cutthroat trout densities were greatest in plunge pool and scour pool habitats (24.81100 m^2 and 20.7/100 m^2, respectively). The highest estimate of biomass per unit area, however, was calculated for scour pool habitat (1.8 lbs./lOO m^2).

3.2.2.4. Alder Creek

Total trout population in the Alder Creek drainage was estimated at 5,380 fish, with cutthroat trout cc prising 30 percent of the total and brook trout the remaining 70 percent (Table 3.77 & 3.79). Total cutthroat trout biomass was estimated at 102.7 pounds. Juveniles accounting for 79 percent of the total biomass. Total estimated brook trout biomass **was** 298 pounds, with juveniles and adults comprising almost equal proportions. Cutthroat trout were found in increasingly greater numbt sfrom reach 1 to 4, however, none were found upstream of reach 5. Total cutthroat trout biomass was greatest in reach 3 (45 percent of total). The highest estimates of cutthroat trout density and biomass occurred in glide habitat (2.9 fish/l00 m^2 and 0.15 lbs./100 m^2). Brook trout were found in all sample reaches except for reach 1, and densities generally ir creased in an upstream direction (Table 3.79). The highest brook trout density occurred in reach 3 of North Fork Alder Creek (61.8 fish/l00 m^2). The highest biomass estimates per unit area were found in mainstem reach 5 (0.48 lbs./lOO m^2). Brook trout were found in the highest densities and biomass in scour hole habitat (12.2 fish/l00 m^2; 1 .I lbs./lOO m^2) (Table 3.80).

Table 3.75 Estimates of cutthroat trout abundance and biomass by reach, 1993.

TRIBUTARY/SPECIES	REACH	LENGTH (ft.)	POP. EST.(N)	SE(N)	#/100 ft.	BIOMASS (lbs) JUVENILES	BIOMASS (lbs) ADULTS
EVANS CREEK/CTT	1	3840	0	0.0	0.0	0.0	0.0
	2	5530	455	34.6	2.9	20.2	11.5
	3	21220	771	21.5	3.6	42.4	11.9
	4	22050	878	42.7	4.0	41.6	8.6
	5	5470	203	36.0	3.7	9.9	0.0
	EF1	6960	123	9.9	1.8	3.5	0.0
	WF1	3090	50	0.0	1.6	1.2	0.0
TOTALS		83160	2480	144.8	3.0	118.91	32.1

Table 3.76 Estimates of cutthroat trout abundance and biomass by habitat type, 1993.

TRIBUTARY/SPECIES	HABITAT TYPE	LENGTH (ft.)	POP. EST.(N)	SE(N)	#/100 ft.	BIOMASS (lbs) JUVENILES	BIOMASS (lbs) ADULTS
EVANS CREEK/CTT	DMP/BVP	1720	166	12.2	9.6	8.3	4.4
	EDP	850	60	0.0	7.1	1.2	0.0
	GLD	3810	0	0.0	0.0	0.0	0.0
	LGR	16810	400	37.3	2.4	18.9	11.5
	PLP	760	209	15.4	27.5	12.4	2.9
	RPD	17630	439	13.1	2.5	15.2	0.0
	SCH	660	203	22.1	30.7	8.7	0.0
	SCP	2480	629	44.8	25.4	40.7	13.3
	SFC	100	0	0.0	0.0	0.0	0.0
	SPC	13120	374	21.0	2.8	13.7	0.0
TOTALS		57940	2480	165.9	4.3	118.9	32.1

Table 3.77 Estimates of cutthroat trout abundance and biomass by reach, 1993.

TRIBUTARY/SPECIES	REACH	LENGTH (ft.)	POP. EST.(N)	SE(N)	#/100 ft.	BIOMASS (lbs) JUVENILES	BIOMASS (lbs) ADULTS
ALDER CREEK/CTT	1	8840	130	53.7	1.5	4.9	0.0
	2	15530	220	49.2	1.4	11.0	2.9
	3	21220	640	116.9	3.0	35.9	10.5
	4	22050	630	59.9	2.9	28.7	7.7
	5	5470	20	0.0	0.4	1.1	0.0
	6	6960	0	0.0	0.0	0.0	0.0
	NF1	3090	0	0.0	0.0	0.0	0.0
	NF2	3090	0	0.0	0.0	0.0	0.0
	NF3	2090	0	0.0	0.0	0.0	0.0
TOTALS		**88340**	**1640**	**279.8**	**1.9**	**81.6**	**21.1**

Table 3.78 Estimates of cutthroat trout abundance and biomass by habitat type, 1993.

TRIBUTARY/SPECIES	HABITAT TYPE	LENGTH (ft.)	POP. EST.(N)	SE(N)	#/100 ft.	BIOMASS (lbs) JUVENILES	BIOMASS (lbs) ADULTS
ALDER CREEK/CTT	DMP/BVP	7390	60	34.6	0.8	3.2	0.0
	GLD	3530	210	116.8	5.9	11.0	0.0
	LGR	52240	860	37.6	1.6	42.0	10.5
	PKW	4500	100	41.1	2.2	4.2	0.0
	PLP	2720	40	0.0	1.5	2.6	0.0
	SCH	2450	30	0.0	1.2	1.2	0.0
	SCP	7070	190	41.6	2.7	11.7	7.7
	SPC	8440	150	53.7	1.8	5.7	2.9
TOTALS		**88340**	**1640**	**325.5**	**1.9**	**81.6**	**21.1**

Table 3.79 Estimates of brook trout abundance and biomass by reach, 1993.

TRIBUTARY/SPECIES	REACH	LENGTH (ft.)	POP. EST.(N)	SE(N)	#/100 ft.	BIOMASS (lbs)	
						JUVENILES	ADULTS
ALDER CREEK/EBT	1	8640	0	0.0	0.0	0.0	0.0
	2	15530	100	6.3	0.61	2.71	16.4
	3	21220	310	115.2	1.5	19.1	36.5
	4	22050	960	81.3	4.4	31.7	43.1
	5	5470	640	30.3	11.7	39.3	20.2
	6	6960	590	44.2	8.5	30.1	9.4
	NF1	3090	390	49.1	12.6	22.8	9.3
	NF2	3090	290	0.0	9.4	11.3	0.0
	NF3	2090	460	41.3	22.0	6.1	0.0
TOTALS		883401	3740	387.8	4.2	163.0	135.0

Table 3.80 Estimates of brook trout abundance and biomass by habitat type, 1993.

TRIBUTARY/SPECIES	HABITAT TYPE	LENGTH (ft.)	POP. EST.(N)	SE(N)	#/100 ft.	BIOMASS (lbs)	
						JUVENILES	ADULTS
ALDER CREEK/EBT	DMP/BVP	7390	160	0.0	2.2	6.5	5.4
	GLD	3530	230	22.8	6.5	12.9	13.8
	LGR	52240	1340	116.9	2.6	60.8	33.7
	PKW	4500	0	0.0	0.0	0.0	0.0
	PLP	2720	270	0.0	9.9	12.2	13.6
	SCH	2450	370	34.7	15.1	27.7	6.8
	SCP	7070	900	103.1	12.7	39.1	58.9
	SPC	8440	470	30.0	5.6	3.1	2.8
TOTALS		88340	3740	307.5	4.2	182.4	135.0

3.2.3. Habitat Use Evaluation

Chi-square goodness of fit tests and analysis of catch rates indicate that cutthroat and brook trout were not distributed uniformly (p<O.OOl) among the available habitat types in the four study drainages. (Table 3.81) Drainage specific catch rates showed considerable variation in selection of habitat types, whereas combined catch rates for both cutthroat and brook trout showed a strong selective tendency for deep water habitat with slower velocities.

BVP/DMP - Combined catch rates were lower in beaver created pools (BVP) and dammed pools (DMP) than all other habitat types utilized by cutthroat and brook trout (0.14 trout/min and 0.13 trout/min, respectively). Chi-square analysis also indicated that trout generally underutilized this habitat type. Observed catch rates for cutthroat and brook trout were 2.3 and 1.7 times lower than expected if populations had been equally distributed among habitat types (Table 3.81).

EDP - Cutthroat trout were observ utilizing eddy pools (EDP) only in the Evans Creek drainage. Combined catch rates, however, were 1.3 times high than expected if populations had been equally distributed among habitat types. Chi-square analy s of the combined observed versus expected values indicated that cutthroat trout selected for eddy pool habitat (Table 3.81). No brook trout were observed in this habitat type.

GLD - Combined catch rates for cutthroat trout (0.15 trout/min) were the second lowest of all habitat types. Catch rates for brook trout fell in the median range for all habitat types (0.24 trout/min). Chi-square analysis indicated that cutthroat trout selected against glide habitats, while brook trout were found 1.1 times more frequently than expected (Table 3.81).

LGR - Combined catch rates for cutthroat trout and brook trout were similar (0.28 trout/min and 0.21 trout/min, respectively) in low gradient riffles (LGR). Chi-square analysis indicated that cutthroat and brook trout were not observed as frequently as expected if populations had been equally distributed among all habitat types (Table 3.81).

PKW - Combined catch rates for cutthroat trout were 0.28 trout/min in pocket water habitat (PKW). No brook trout were observed in this habitat type. Chi-square analysis indicated that cutthroat trout generally underutilized this habitat type. Catch rates were 1.2 t ime less than expected if populations had been equally distributed among a l habitat types (Table 3.81).

PLP - Combined catch rates for cutthroat trout were higher in plunge pools (PLP) than in any other habitat type (0.71 trout/min). Combined catch rates for brook trout were 0.34 trout/min. Chi-square analysis indicated that trout selected for this habitat type. Observed catch rates for cutthroat and brook trout were 2.2

and 1.5 times higher than expected if populations had been equally distributed among habitat types (Table 3.81).

RPD - Combined catch rates for cutthroat trout (0.55 trout/min) were second highest among all habitat types. Chi-square analysis indicated that trout selected for this habitat type. Observed catch rates were 1.7 times higher than expected if populations had been equally distributed among habitat types (Table 3.81). No brook trout were observed in rapids.

SCH - Combined catch rates for cutthroat and brook trout were 0.43 trout/min and 0.63 trouffmin, respectively. Catch rates for brook trout in scour holes (SCH) were higher than in any other habitat type. Chi-square analysis indicated that trout selected for this habitat type. Observed catch rates for cutthroat and brook trout were 1.3 and 2.8 times greater than expected (Table 3.81).

SCP - Combined catch rates for cutthroat and brook trout in scour pools (SCP) were similar (0.45 trout/min and 0.46 trout/min). Catch rates for brook trout were second highest among all habitat types. Observed catch rates were 1.4 and 2.1 times higher than expected for cutthroat and brook trout, respectively (Table 3.81). Chi-square analysis indicated that trout selected for this habitat type.

SPC - Combined catch rates for step-pool cascades (SPC) were 0.37 trouffmin for cutthroat trout and 0.20 trout/min for brook trout. Chi-square anaysis indicated that cutthroat trout selected for this habitat type, while brook trout selected against it. Observed catch rates were 1.2 times higher than expected for cutthroat and 1 .l times lower than expected for brook trout (Table 3.81).

3.2.4. Spawning Surveys

Spawning surveys were conducted on Lake, Benewah, Evans, and Alder creeks during late May. During 1993 and 1994 the entire stream length was surveyed to locate and identify redds. Because spawning surveys were conducted during spring runoff, it was difficult to see the bottom of the stream channel, especially in mainstem areas. No redds were located in any drainages.

3.2.5. Trout Migration Analysis

Traps were monitored in Lake, Benewah, Evans, and Alder creeks from mid-March through mid-May, 1994. Migration traps were not successfully installed in 1993 due to severe runoff conditions. A total of 1,348 fish were caught in all traps in 1994. Cutthroat trout comprised the greatest proportion of the catch (95 percent) with largescale sucker, redside shiner, brook trout, longnose sucker, and pumpkinseed comprising the remainder of the catch.

Table 3.81 Chl-Square analysis of combined observed and expected values for electrofishing catches by habitat type, 1993.

		C R				EBT			
Habitat Type	Effort (mln)	Obs.	Exp.	Mag.	p-Value	Obs.	Exp.	Mag.	p-Valus
BVP/DMP	160	22	51.5	-2.3		21	35.7	-1.7	
EDP	15	6	4.8	1.3		0	3.3		
GLD	203	30	65.2	-2.2		49	45.2	1.1	
LGR	668	188	214.9	-1.1		139	149.0	-1.1	
PKW	127	35	40.8	-1.2		0	28.3		
PLP	79	56	25.4	2.2		27	17.6	1.5	
RPD	100	55	32.2	1.7					
SCH	55	24	17.8	1.3		35	12.3	2.8	
SCP	216	97	69.5	1.4		99	48.2	2.1	
SFC	8	0	2.6						
SPC	234	87	75.3	1.2		46	52.2	-1.1	
TOTAL	1866	600	600		~0.001	416	416.0		<0.00l

A total of six hundred ninty-eight fish were caught in Lake Creek traps, of which 99 percent were cutthroat trout. Analysis of cutthroat trout age class structure showed that age 2+ fish were the most abundant age class followed by 6+, 5+ and 7+ (Figure 3.1). Immature trout (age 0+ through 3+) comprised 64 percent of the population and adult trout (4+ and older) made up 36 percent of the total catch.

Upstream migration of cutthroat trout in the Lake Creek drainage was concentrated within the period March 20-April23. Approximately, 71 percent of all upstream migration occurred during this period. Upstream movement past the lower Lake Creek trap consisted primarily of mature fish (age 5+ - 7+) greater than 277 mm total length (Figure 3.2). Most of these fish were thought to belong to adfluvial stocks. In contrast, upstream movement at the upper Lake Creek trap was dominated by age 2+ fish (Figure 3.3). Trap data indicated that spawning activity of adfluvial stocks occurred primarily below the confluence with Bozard Creek, in reaches l-7.

A total of five hundred eighty-seven fish were trapped in Benewah Creek, of which 90 percent were cutthroat trout and 1.7 percent were brook trout. Analysis of cutthroat trout age class structure showed that age 2+ and 3+ fish were the most abundant age classes, accounting for 56 percent of the population. Age 7+ and 5+ trout comprised 18 and 17 percent of the population, respectively (Figure 3.4).

Upstream migration of cutthroat trout in Benewah Creek conformed to a bimodal distribution, with mature fish (age 5+ - 7+) migrating past the lower trap during the period April 3 to April 30, while the number of juvenile migrants peaked during the week May 15-21 (Figure 3.5). The age distribution of upstream migrants at the lower Benewah Creek trap consisted primarily of age classes 5+ and 7+ (28 and 30 percent of the total catch, respectively). Age 2+ fish comprised 21 percent of the catch in lower Benewah Creek. The timing of adult migration into Benewah Creek generally coincided with runs into Lake Creek. A total of 48 fish were caught in the trap set at the mouth of SE. Benewah Creek. These fish were primarily age class 3+ and 2+, 50 and 19 percent of the total catch, respectively. Twenty-seven percent were mature fish (age classes 5-7). An additional nine trout were caught at the mouth of Whitetail Creek, however, only one of these fish was a mature adult.

Fish trapped in the Alder and Evans creek drainages accounted for less than 10 percent of the total catch. Thirty-nine fish were trapped in Alder Creek, of which three were mature cutthroat trout greater than 320 mm total length. A total of eighty-four fish were caught in Evans Creek, none of which were trout species.

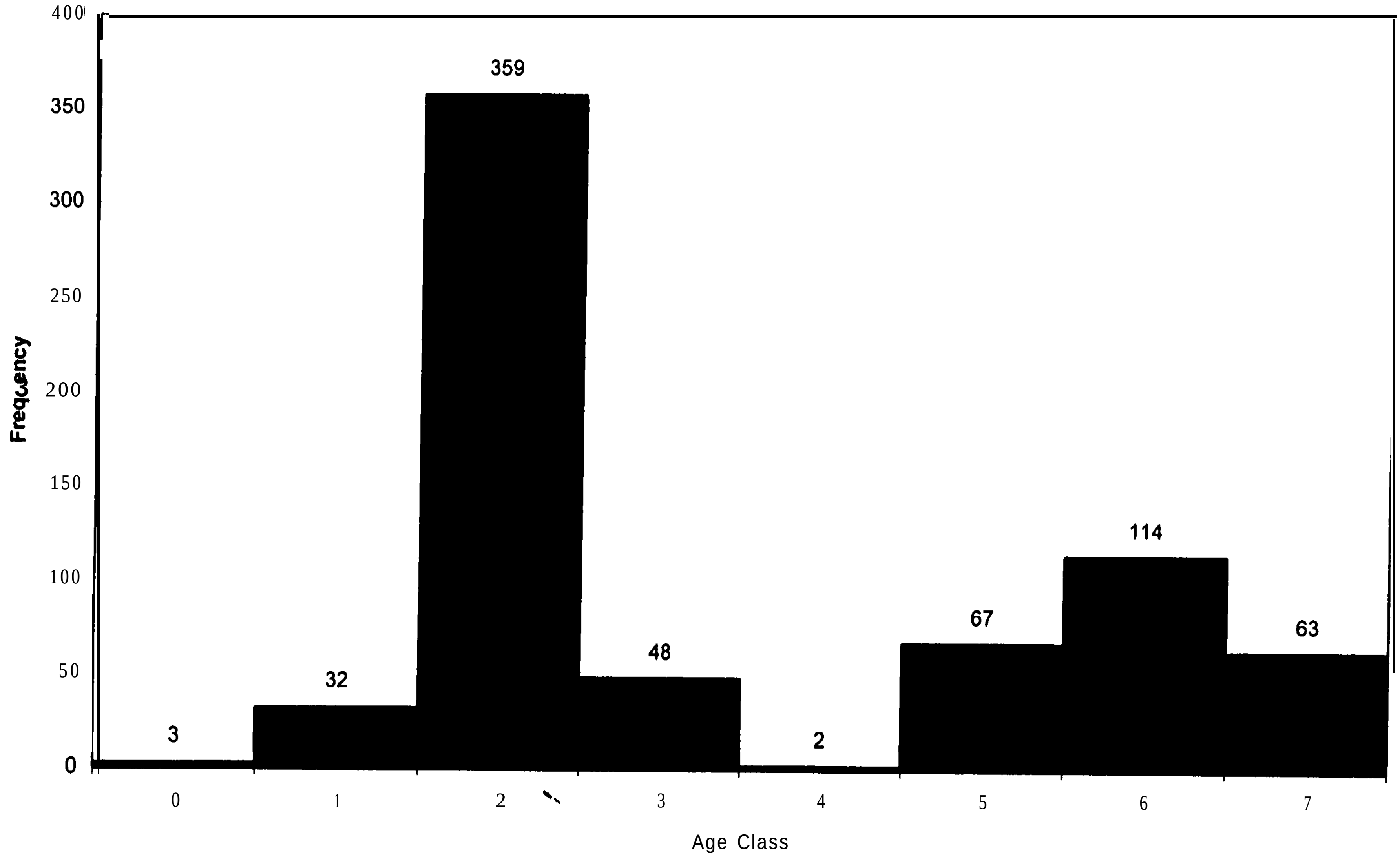

Figure 3.1 Age frequency of cutthroat trout in Lake Creek, March-May, 1994.

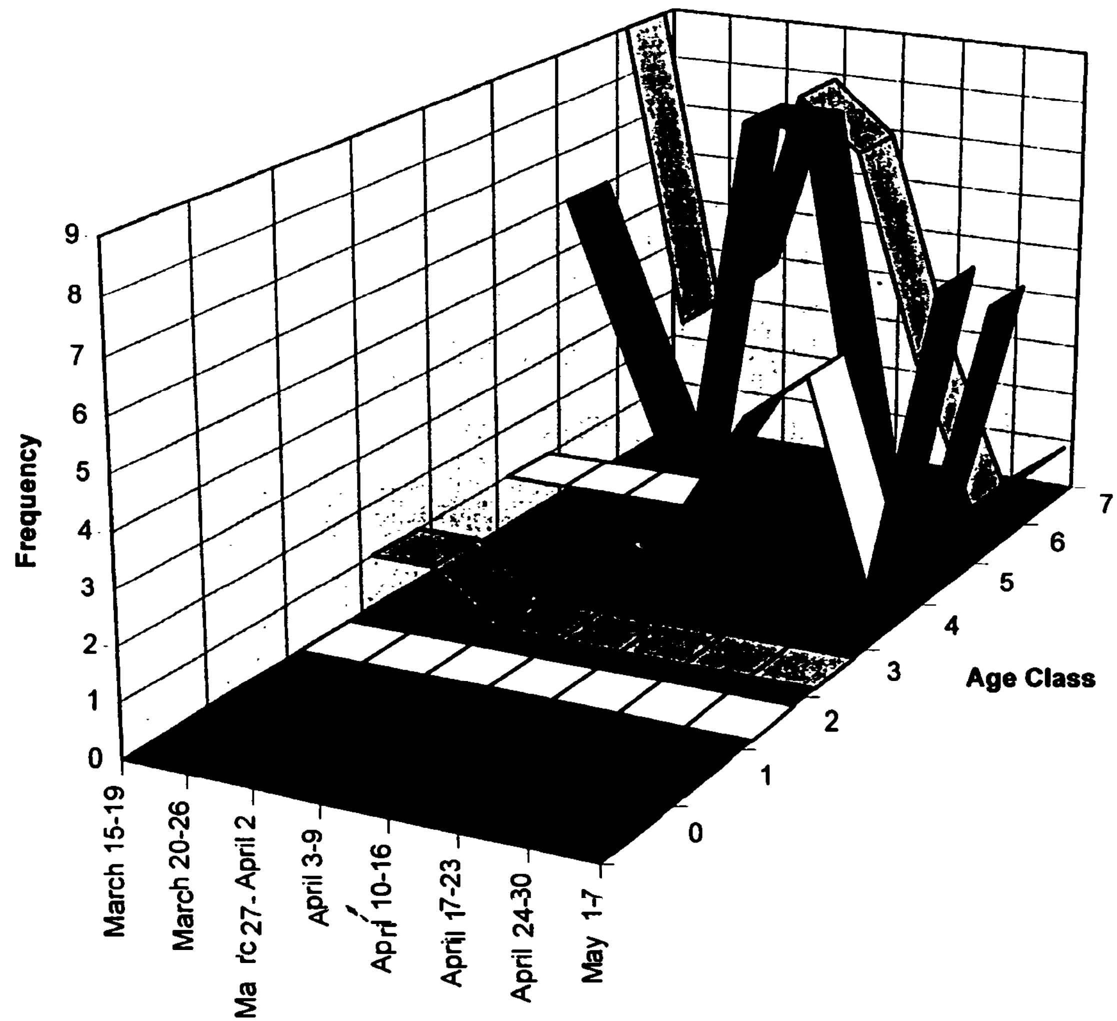

Figure 3.2 Timing of upstream migration for cutthroat trout in lower Lake Creek.

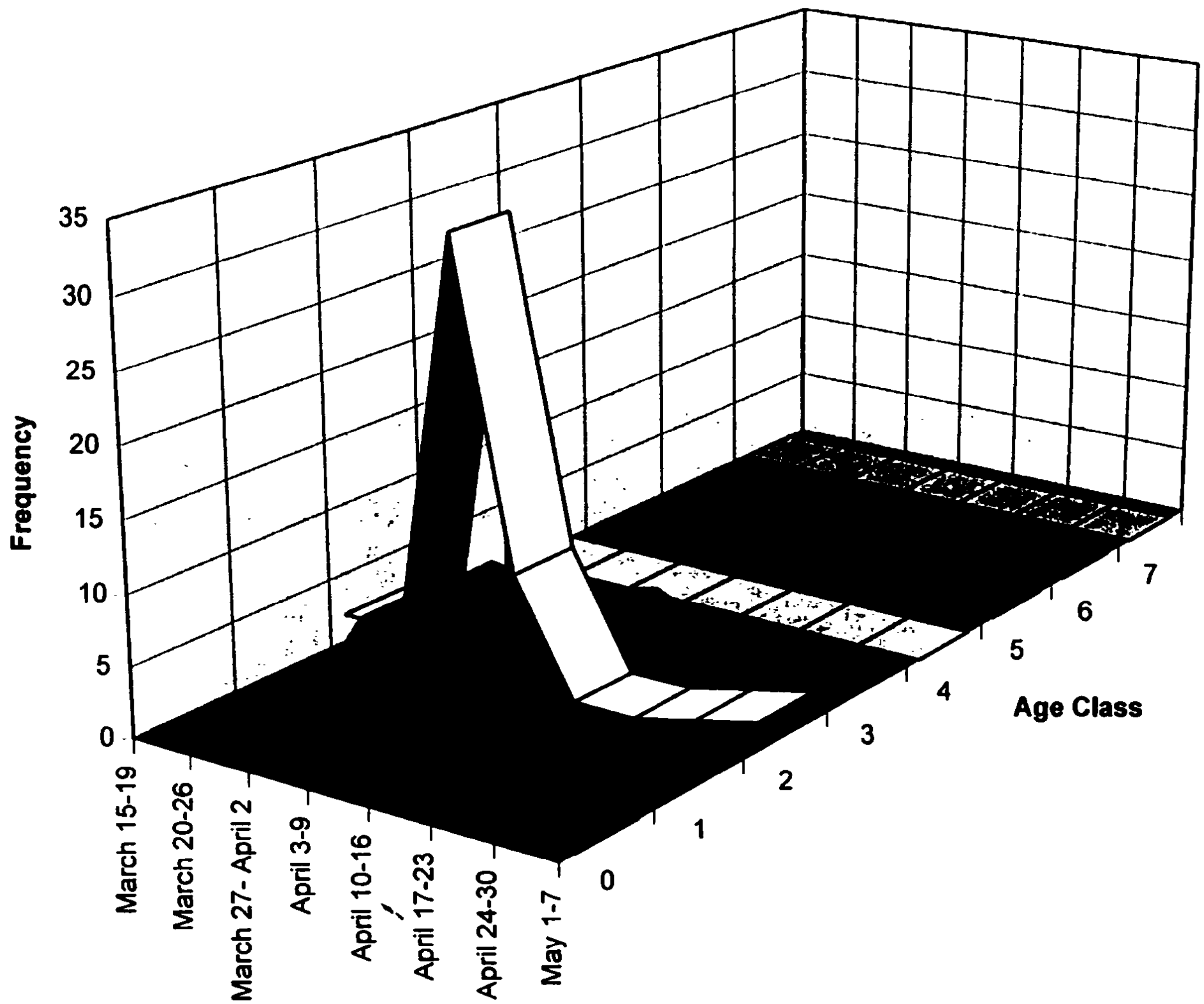

Figure 3.3 Timing of upstream migration for cutthroat trout in upper Lake Creek.

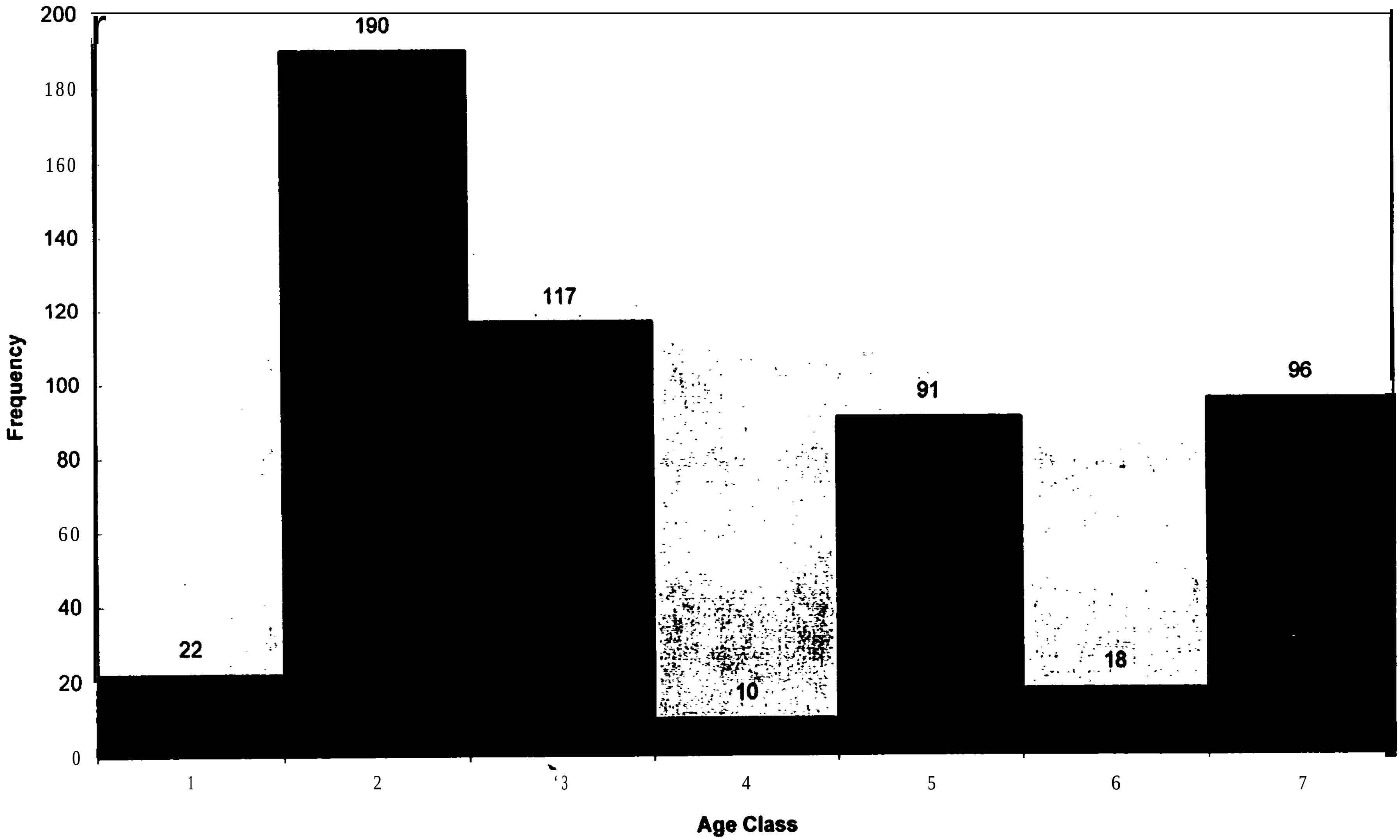

Figure 3.4 Age frequency of cutthroat trout in Benewah Creek, March-May, 1994.

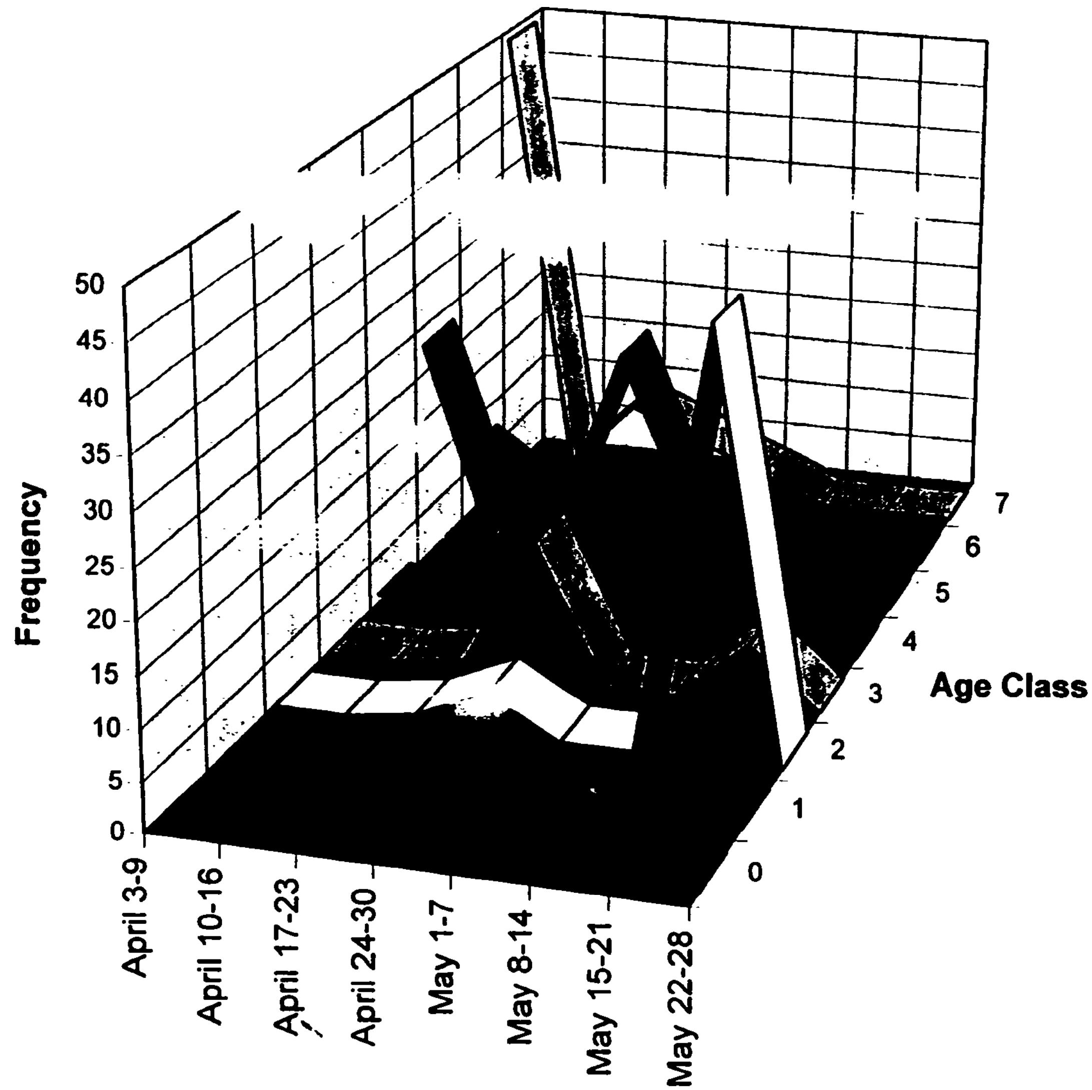

Figure 3.5 Timing of upstream migration for cutthroat trout in lower Benewah Creek.

3.2.6. Age, Growth and Condition

3.2.6.1. 1993

Lake Creek

A total of 145 scales were collected from cutthroat trout in Lake Creek for age determination. Back-calculated lengths for cutthroat trout at the first annulus ranged from 60 to 74 mm with a grand mean of 66.2 mm (Table 3.82). At the end of the second years growth, lengths ranged from 79 to 105 mm with a grand mean of 92 mm. At the end of the third years growth, lengths ranged from 109 to 144 mm with a grand mean of 122 mm. At the end of the fourth years growth lengths ranged from 144 to 172 mm with a grand mean of 158 mm. At the end of the fifth year of growth, lengths ranged from 163 to 198 with a grand mean of192 mm. At the end of the sixth year of growth lengths averaged 183 mm.

Mean lengths, weights and condition factors for each age class of cutthroat trout in Lake Creek are listed in Table 3.83. Mean condition factors ranged from 0.9 for 2+ and 3+ age classes to 1.2 for l+ age classes with an overall mean of 1.0.

Benewah Creek

A total of 125 scales were collected from cutthroat trout in Benewah Creek for age determination. Back-calculated lengths for cutthroat trout at the first annulus ranged from 72 to 80 mm with a grand mean of 74 mm. At the second years of growth, lengths ranged from 95 to 106 mm with a grand mean of 100 mm. At the end of the third years of growth, lengths ranged from 118 to 149 mm with a grand mean of 126 mm. At the end of the fourth years of growth, lengths ranged from 139 to 190 mm with a grand mean of 151 mm. At the end of the fifth year of growh, lengths ranged from 171 to 223 mm with a grand mean of 190 mm. Lengths at the end of six years of growth were 247 mm (Table 3.84).

Mean lengths, weights and condition factors for each age class of cutthroat trout in Benewah Creek are listed in Table 3.85. Mean condition factors ranged from 0.8 for 2+ age class to 1 .l for the 6+ age class with an overall mean of 1.0.

Evans Creek

A total of 365 scales were collected from cutthroat trout in Evans Creek for age determination. Back-calculated lengths for cutthroat trout at the first annulus ranged from 68 to 78 mm with a grand mean of 71 mm. At the end of the second years growth, lengths ranged from 93 to 97 mm with a grand mean of 94 mm. At the end of the third year of growth, lengths ranged from 114 to 123 mm with a grand mean of 115 mm. At the end of the fourth year of growth,

Table 3.82 Mean back-calculated lengths at the end of each years growth (annulus formation) for each age class of cutthroat trout in Lake Creek, 1993.

	MEAN ± S.D. BACK CALCULATED LENGTH AT ANNULUS						
Cohort	**N**	**1**	**2**	**3**	**4**	**5**	**6**
1992	24	66.4 ± 8.4					
1991	40	66.9 ± 7.3	91.8 ± 12.1				
1990	37	62.1 ± 8.2	86.4 ± 13.1	109.5 ± 16.4			
1989	31	68.0 ± 24.6	95.2 ± 17.9	129.9 ± 23.7	154.9 ± 23.1		
1988	10	74.2 ± 11.8	104.9 ± 18.3	144.2 ± 27.9	171.7 ± 43.5	198.3 ± 53.6	
1987	1	59.8	79.2	124.4	143.8	163.2	182.5
GRAND MEAN	145	66.2 ± 8.9	91.9 ± 14.4	122.1 ± 22.4	158.3 ± 27.8	192.4 ± 50.4	182.5
MEAN ANNUAL GROWTH INCREMENT		66	26	30	36	34	-

Table 3.83 Mean lengths, weights and condition factors for each age class of cutthroat trout in Lake Creek, 1993.

Age	N	Mean weight (g) ±SD	Mean length (mm) ±SD	Mean K_{tl} ±SD
0+	14	58.7 ± 10.2	2.2 ± 1.2	1.0 ± 0.2
1+	23	77.3 ± 12.3	5.6 ± 2.7	1.2 ± 0.2
2+	40	108.6 ± 15.9	11.4 ± 5.0	0.9 ± 0.2
3+	37	122.5 ± 19.6	18.1 ± 11.1	0.9 ± 0.2
4+	30	171.2 ± 19.5	52.8 ± 18.5	1.0 ± 0.1
5+	10	212.3 ± 51.7	130.8 ± 18.4	1.0 ± 0.2
6+	1	189	67	1.0
Total	158			1.0 ± 0.2

Table 3.84 Mean back-calculated lengths at the end of each years growth (annulus formation) for each age class of cutthroat trout in Benewah Creek (including tributaries), 1994.

	MEAN ± S.D. BACK CALCULATED LENGTH AT ANNULUS						
Cohort	N	1	2	3	4	5	6
1992	7	71.6 ± 3.4					
1991	23	76.1 ± 9.4	103.9 ± 14.8				
1990	18	79.6 ± 10.9	104.9 ± 15.2	128.3 ± 17.1			
1989	42	72.7 ± 8.2	95.1 ± 11.3	117.9 ± 12.7	139.1 ± 14.9		
1988	22	72.1 ± 6.5	97.2 ± 13.9	126.9 ± 26.6	152.0 ± 35.6	170.7 ± 38.9	
1987	13	74.3 ± 9.0	105.6 ± 15.1	149.2 ± 42.6	189.7 ± 55.9	222.9 ± 68.9	247.7 ± 69.0
GRAND MEAN	125	74.3 ± 8.7	99.9 ± 14.1	126.2 ± 24.9	151.3 ± 36.0	190.1 ± 57.2	246.7 ± 69.0
MEAN ANNUAL GROWTH INCREMENT		74	26	26	25	39	57

Table 3.85 Mean lengths, weights and condition factors for each age class of cutthroat trout in Benewah Creek (including tributaries), 1994.

Age	N	Mean weight (g) ±SD	Mean length (mm) ±SD	Mean K_{tl} ±SD
0+	4	56.3 ± 3.0	1.8 ± 0.5	1.0 ± 0.4
1+	36	75.3 ± 16.8	4.6 ± 3.8	1.0 ± 0.4
2+	32	118.8 ± 17.4	14.9 ± 6.5	0.8 ± 0.3
3+	27	137.7 ± 21.0	26.6 ± 1.8	0.9 ±0.1
4+	51	147.1 ± 19.2	29.6 ± 18.3	0.9 ± 0.2
5+	31	175.4 ± 38.0	59.0 ± 49.8	1.0 ± 0.2
6+	12	253.9 ± 75.4	230.2 ± 199.7	1.1 ± 0.3
Total	193			1.0 ± 0.3

lengths ranged from 137 to 148 mm with a grand mean of 138 mm. At the end of the fifth year of growth, lengths ranged from 164 to 168 mm with a grand mean of 165 mm. At the end of the sixth year of growth, lengths were 192 mm (Table 3.86).

Mean lengths, weights and condition factors for each age class of cutthroat trout in Evans Creek are listed in Table 3.87. Mean condition factors range from 0.9 for age classes 1+,2+ and 3+, to 1 .l for 6+ fish with an overall mea 0.9.

Alder Creek

A total of 227 scales were collected from cutthroat trout in Alder Creek for age determination. Back-calculated lengths for cutthroat trout at the first annulus ranged from 58 to 77 mm with a grand mean of 65 mm. At the end of the second years growth, lengths ranged from 80 to 119 mm with **a** grand mean of 94 mm. At the end of the third year of growth, lengths ranged from 109 to 150 mm with a grand mean of 120 mm. At the end of the fourth year of growth, lengths ranged from 134 to 192 mm with a grand mean of 141 mm. At the end of the fifth year of growth, lengths ranged from 156 to 223 with a grand mean of 189. At the end of the sixth year of growth, lengths averaged 255 mm (Table 3.88).

Mean lengths, weights and condtion factors for each age class of cutthroat trout in Alder Creek are listed in Table 3.89. Mean condition factors ranged from 0.9 for 2+,3+,4+ snf 6+ fish to 1 .l for 0+ fish with an overall mean of 0.9.

A total of 357 scales were collected from eastern brook trout in Alder Creek for age determination. Back-calculated lengths for eastern brook tr out at the first annulus ranged from 54 to 63 mm with a grand mean of 60 mm. the end of the second year of growth, lengths ranged from 82 to 99 mm with a grand mean of 92 mm. At the end of the third year of growth, lengths ranged from 126 to 135 mm with a grand mean of 129 mm. At the end of the fourth year of growth, lengths ranged from 158 to 171 mm with a grand mean of 159 mm. At the end of the fifth years growth, lengths ranged from 189 to 203 mm with a grand mean of 191 mm. At the end of the sixth year of growth lengths were calculated at 239 mm (Table 3.90).

Mean lengths, weights, and condition factors for each age class of eastern brook trout in Alder Creek are listed in Table 3.91. M in condition factors ranged from 0.9 for l+ and 2+ fish to 1 .l for 0+ fish, with an overall mean of 0.9 mm.

Table 3.86 **Mean back-calculated lengths at the end of each years growth (annulus formation) for each age class of cutthroat trout in Evans Creek, 1994.**

	MEAN ± S.D. BACK CALCULATED LENGTH AT ANNULUS						
Cohort	**N**	**1**	**2**	**3**	**4**	**5**	**6**
1992	74	78.2 ± 12.6					
1991	93	67.9 ± 8.5	94.4 ± 13.9				
1990	101	69.7 ± 17.3	93.6 ± 22.9	114.4 ± 22.0			
1989	78	69.9 ± 12.6	92.8 ± 16.0	114.6 ± 23.7	137.4 ± 23.1		
1988	17	71.5 ± 12.6	93.9 ± 14.2	116.3 ± 17.7	139.2 ± 22.5	164.1 ± 27.9	
1987	2	72.3 ± 17.4	97.4 ± 26.1	122.6 ± 34.8	148.0 ± 43.4	167.6 ± 44.8	192.3 ± 39.4
GRAND MEAN	365	71.1 ± 13.7	93.7 ± 18.0	114.7 ± 22.3	137.9 ± 23.1	164.5 ± 28.4	192.3 ± 39.4
MEAN ANNUAL GROWTH INCREMENT		71	23	21	23	27	27

Table 3.87 **Mean lengths, weights and condition factors for each age class of cutthroat trout in Evans Creek, 1994.**

Age	N	Mean weight (g) ±SD	Mean length (mm) ±SD	Mean K_{tl} ±SD
0+	19	65.1 ± 12.6	2.9 ± 2.0	1.0 ± 0.4
1+	74	94.3 ± 12.7	7.8 ± 5.7	0.9 ± 0.1
2+	84	113.2 ± 15.4	13.4 ± 7.1	0.9 ± 0.2
3+	98	129.1 ± 21.9	21.5 ± 14.1	0.9 ± 0.1
4+	76	150.3 ± 24.8	36.2 ± 21.4	1.0 io.2
5+	17	175.8 ± 28.8	61.5k41.4	1.0 ± 0.2
6+	2	207.5 ± 47.4	112.5 ± 95.5	1.1 ± 0.3
Total	368			0.9 ± 0.5

Table 3.88 Mean back-calculated lengths at the end of each years growth **(annulus** formation) for each age class of cutthroat trout in Alder Creek, 1994.

	MEAN ± S.D. BACK CALCULATED LENGTH AT ANNULUS						
Cohort	**N**	**1**	**2**	**3**	**4**	**5**	**6**
1992	14	62.2 ± 8.8					
1991	42	64.0 ± 7.8	97.9 ± 9.7				
1990	82	68.1 ± 20.9	99.7 ± 26.1	123.9 ± 22.3			
1989	72	63.9 ± 10.9	90.3 ± 14.8	118.7 ± 18.3	141.5 ± 24.8		
1988	16	58.3 ± 10.5	80.4 ± 17.4	109.1 ± 26.5	134.4 ± 30.5	155.5 ± 34.2	
1987	1	77.1	118.9	150.2	191.9	223.2	254.6
GRAND MEAN	227	65.0 ± 15.0	94.3 ± 21.0	120.4 ±21.7	140.6 ± 26.4	189.1 ± 36.7	254.6
MEAN ANNUAL GROWTH INCREMENT		65	29	26	21	48	66

Table 3.89 Mean lengths, weights and condition factors for each age class of cutthroat trout in Alder Creek, 1994.

Age	N	**Mean weight(g) ±SD**	**Mean length (mm) ±SD**	**Mean K_{tl} ±SD**
0+	3	64.3 ± 3.8	**3.0** ± 1.0	1.1 io.3
1+	8	71.8 ± 8.2	3.5 ± 1.1	**1.0 ± 0.2**
2+	**36**	**118.6 ± 12.7**	15.3 ± 7.0	**0.9 ± 0.3**
3+	80	142.3 ± 18.9	26.4 ± 12.6	0.9 ± 0.2
4+	72	150.9 ± 27.8	34.5 i27.5	0.9 ± 0.1
5+	16	163.0 ± 33.6	51.4f41.7	**1.0 ± 0.2**
6+	1	265	170	0.9
Total	225			0.9 ± 0.2

Table 3.90 Mean back-calculated lengths at the end of each years growth (annulus formation) for each age class of eastern brook trout in Alder Creek, 1994.

	MEAN ± S.D. BACK CALCULATED LENGTH AT ANNULUS						
Cohort	N	1	2	3	4	5	6
1992	52	54.8 ± 8.6					
1991	77	56.8 ± 13.6	81.7 ± 21.9				
1990	106	62.6 ± 16.3	99.3 ± 24.1	131.1 ± 33.3			
1989	76	61.4 ± 13.2	92.9 ± 18.0	127.2 ± 31.4	157.7 ± 28.8		
1988	38	60.0 ± 11.4	91.8 ± 14.7	126.1 ± 21.9	157.7 ± 26.0	188.6 ± 29.1	
1987	8	60.7 ± 11.9	93.4 ± 15.6	134.7 ± 19.2	170.6 ± 21.9	203.1 ± 23.0	239.1± 26.3
GRAND MEAN	357	59.6 ± 13.8	92.2 ± 21.8	129.1 ± 30.4	158.6 ± 27.6	191.4 ± 28.4	239.1± 26.3
MEAN ANNUAL GROWTH INCREMENT		60	32	37	30	32	47

Table 3.91 Mean lengths, weights and condition factors for each age class of eastern brook trout in Alder Creek, 1994.

Age	N	Mean length (mm) ±SD	Mean weight (g) ±SD	Mean K_{tl} ±SD
0+	3	30.7± 8.4	2.7i1.5	1.1 ± 0.3
1+	52	71.2 ± 9.4	3.4 ± 1.7	0.9 ± 0.3
2+	77	98.8 ± 30.6	10.8 ± 14.3	0.9 ± 0.2
3+	104	147.5 ± 31.0	35.3 k26.9	1.0 ± 0.2
4+	74	173.3 k25.4	53.9 k25.5	1.0 ± 0.2
5+	38	199.6 ± 31.4	83.8 ± 35.9	1.0 ± 0.3
6+	38	244.4 ± 19.3	150.9 ± 28.4	1.0 ± 0.2
Total	354			0.9 ± 0.2

3.2.6.2. **1994**

Lake Creek

A total of 730 scales were collected from cutthroat trout in Lake Creek for age determination. Back-calculated lengths for cutthroat trout at the first annulus ranged from 51 to 89 mm with a grand mean of 71.4 mm (Table 3.92). At the end of the second years growth. lengths ranged from 88 to 143 mm with a grand mean of 114 mm. At the end of the third years growth, lengths ranged from 121 to 211 mm with a grand mean of 152 mm. At the end of the fourth years growth lengths ranged from 175 to 258 with a grand mean of 231 mm. At the end of the fifth year of growth, leng: ranged from 261 to 321 with a grand mean of 277 mm. At the end of the sixty year of growth lengths ranged from 309 mm to 328 mm with a grand mean of 327 mm. At the end of the seventh year of growth lengths averaged 351 mm.

Mean lengths, weights and condition factors for each age class of cutthroat trout in Lake Creek are listed in Table 3.93. Mean condition factors ranged from 0.8 for 2+ age classes to 1.3 for 0+ age classes with an overall mean of 0.9.

Benewah Creek

A total of 681 scales were collected from cutthroat trout in Benewah Creek for **age** determination during 1994. Back-calculated lengths for cutthroat trout at the first annulus ranged from 62.5 mm to 68 mm with a grand mean of 65 mm. At the end of the second years growth, lengths ranged from 108 mm to 115 mm with a grand mean of 112 mm. At the end of the third years of growth lengths ranged from 149 mm to 163 mm with a grand mean of 155 mm. At the end of the fourth year of growth, lengths ranged from 184 mm to 206 mm with **a** grand mean of 199 mm. At the end of the fifth year of growth, lengths ranged from 264 mm to 280 mm with a grand mean of 279 mm. At the end of the sixth year of growth, lengths ranged from 321 mm to 337 mm with a grand mean of 337 mm At the end of the seventh year of growth lengths averaged 342 mm (Tab, 3.94)

Mean lengths, weights and condition factors for each age class of cutthroat trout in Benewah Creek are listed in Table 3.95. Mean condition factors ranged from 0.8 for 2+ **age** classes to 1 .O for 5+ **age** classes with an overall mean of 1.0.

A total of 100 s ales were collected from eastern b ook trout in Benewah Creek for age determi .ation during 1994. Back-calculated lengths for eastern brook trout at the first annulus ranged from 57 mm to 66 mm with a grand mean of 63 mm. At the end of the second year of growth, lengths ranged from 112 mm to 117 mm with an grand mean of 115 mm. At the end of the third year of

Table 3.92 Mean back-calculated lengths at the end of each years growth (**annulus** formation) for each age class of cutthroat trout in Lake Creek, 1994.

		MEAN ± S.D. BACK CALCULATED LENGTH AT **ANNULUS**						
Cohort	**N**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1993	56	63.8±9.9						
1992	168	71.1 ±5.3	113.5 ± 9.3					
1991	273	50.9±18.2	88.4 ± 20.8	120.8 ± 18.5				
1990	20	75.3 ± 6.5	118.5 ± 9.9	154.2 ± 13.9	174.8 ± 37.6			
1989	4	89.4 ± 24.1	143.1 ± 37.3	211.2 ±46.2	258.4 ± 46.0	320.8 ± 41.5		
1988	200	76.5 ± 8.2	121.8 ± 13.2	175.0 ± 19.9	237.4 ± 131.4	277.3 ± 26.3	327.6 ± 29.7	
1987	9	71.8 ± 4.6	118.6 ± 15.8	166.4 ± 14.4	212.0 ± 13.0	260.7 ± 20.5	308.7 ± 22.7	350.8 ± 24.6
GRAND MEAN	730	71.4 ± 7.9	114.2 ± 12.3	151.9 ± 27.6	231.4 ± 123.7	277.4 ± 27.2	326.8 ± 29.7	350.8±24.6
MEAN ANNUAL GROWTH INCREMENT		71	43	38	79	46	50	24

Table 3.93 Mean lengths, weights and condition factors for each age class of cutthroat trout in Lake Creek, 1994.

Age	N	**Mean weight (g) ±SD**	**Mean length (mm) ±SD**	**Mean K_{tl} ±SD**
0+	3	1.7 ± 0.6	50.0 ± 6.2	1.3 ± 0.1
1+	58	3.8 ± 1.7	69.8 ± 13.1	1.1 ± 0.4
2+	168	14.3 ± 3.8	118.7 ± 8.4	0.8 ± 0.2
3+	273	22.9 ± 6.1	136.6 ± 10.9	0.9 ± 0.2
4+	20	52.9 ± 19.9	182.4 ± 20.4	0.9 ± 0.2
5+	4	284.0 ± 93.1	325.5 ± 42.7	0.8 ± 0.2
6+	200	299.1 ± 79.2	333.4 ± 21.5	0.8 ± 0.2
7+	9	430.6 ± 142.9	359.0 ± 22.7	0.9 ± 0.2
Total	733			0.9

Table 3.94 Mean back-calculated lengths at the end of each years growth **(annulus** formation) for each age class of cutthroat trout in Benewah Creek, 1994.

	MEAN ± S.D. BACK CALCULATED LENGTH AT ANNULUS							
Cohort	**N**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1993	17	63.8 ± 9.4						
1992	214	64.6 ± 5.9	112.0 ± 10.1					
1991	218	63.9 ± 5.1	111.4 ± 8.1	148.9 ± 12.5				
1990	49	63.9 ± 7.8	110.6 ± 10.5	150.8 ± 13.1	183.6 ± 14.1			
1989	9	66.4 ± 6.2	114.5 ± 13.4	159.5 ± 17.7	199.9 ± 21.3	261.3 ± 23.2		
1988	161	67.9 ± 4.9	114.8 ± 7.7	163.4 ± 12.8	205.6 ± 16.4	279.9 ± 19.6	337.1 ± 20.54	
1987	65	62.5 ± 1.8	108.3 ± 6.9	148.9 ± 6.0	189.9 ± 7.1	264.1 ± 12.6	321.2 ± 18.2	342.26 ± 51.8
GRAND MEAN	681	65.1 ± 5.9	112.3 ± 9 1	154.6 ± 14.4	198.7 ± 17.9	278.5 ± 20.2	336.6 ± 20.6	342.3 ± 51.8
MEAN ANNUAL GROWTH INCREMENT		65	47	43	44	80	58	5

Table 3.95 Mean lengths, weights and condition factors for each age class of cutthroat trout in Benewah Creek, 1994.

Age	N	Mean length (mm) ±SD	Mean weight (g) ±SD	Mean K_{tl} ±SD
0+	2	55.5 ± 3.5	3.0 ± 0.0	1.78i0.34
1+	16	76.2 i13.3	4.5 ± 2.0	1.00 ± 0.25
2+	80	120.4 ± 11.5	14.1 ± 5.2	0.78 i0.17
3+	211	154.9i16.4	31.4i12.7	0.83 ± 0.21
4+	49	186.9i15.2	58.2 ± 17.4	0.87 k0.16
5+	10	271.3i25.7	191.0i56.6	1.04 ± 0.69
6+	169	339.0 ± 22.9	345.5 k65.3	0.89 k0.22
7+	5	379.4 ± 20.7	450.4 ± 137.2	0.81 f0.12
Total	542			1

growth, lengths averaged 158 mm. At the end of the fourth year of growth, lengths averaged 202 mm (Table 3.96).

Mean lengths, weights and condition factors for each age class of eastern brook trout in Benewah Creek are listed in Table 3.97. Mean overall condition factors were 0.9.

Evans Creek

A total of 221 scales were collected from cutthroat trout in Evans Creek for age determination during 1994. Back-calculated lengths for cutthroat trout at the first annulus ranged from 55 mm to 61 mm with a grand mean of 56 mm. At the end of the second year of growth, lengths ranged from 109 mm to 121 mm with a grand mean of 111 mm. At the end of the third year of growth, lengths ranged from 167 mm to 171 mm with a grand mean of 163 mm. At the end of the fourth year of growth lengths averaged 221 mm (Table 3.98).

Mean lengths, weights, and condition factors for each age class of cutthroat trout in Evans Creek are listed in Table 3.99. Mean condition factors for cutthroat trout ranged from 0.7 for 3+ age classes to 1 .1 for 4+ age classes with an overall mean of 0.9.

Alder Creek

A total of 92 scales were collected from cutthroat trout in Alder Creek for age determination during 1994. Back-calculated lengths for cutthroat trout at the first annulus ranged from 60 mm to 65 mm with a grand mean of 62 mm. At the end of the second year of growth lengths ranged from 108 mm to 119 mm with a grand mean of 111 mm. At the end of the third year of growth, lengths ranged from 151 mm to 161 mm with a grand mean of 158 mm. At the end of the fourth years of growth, lengths averaged 198 mm (Table 3.100).

Mean lengths, weights, and condition factors for each age class of cutthroat trout in Alder Creek are listed in Table 3.101. Mean condition factors for cutthroat ranged from 0.8 for 2+ and 3+ age classes to 1.6 for 0+ age class with an overall mean of 0.9.

A total of 452 scales were collected from eastern brook trout in Alder Creek for age determination during 1994. Back-calculated lengths for eastern brook trout at the first annulus ranged from 54 mm to 62 mm with a grand mean of 59 mm. At the end of the second years of growth, average lengths ranged from 95 mm to 104 mm with a grand mean of 101 mm. At the end of the third years of growth lengths ranged. from 150 mm to 159 mm with a grand mean of 154 mm. At the end of the fourth years of growth, lengths averaged 199 mm (Table 3.102).

Table 3.96 Mean back-calculated lengths at the end of each years growth (annulus formation) for each age class of eastern Brook trout In Benewah Creek, 1994.

Cohort	N	MEAN ± S.D. BACK CALCULATED LENGTH AT ANNULUS 1	2	3	4
1993	38	66.3 ± 8.0			
1992	24	60.2 ± 6.9	117.2 ± 7.9		
1991	31	60.8 ± 5.1	114.1 ± 8.4	158.9 ± 14.0	
1990	7	57.1 ± 5.7	111.9 ± 9.4	158.2 ± 8.9	202.0 ● 14.9
GRAND MEAN	100	62.5 ± 7.4	115.1 ± 8.4	158.7 ± 13.1	202.0 ± 14.99
MEAN ANNUAL GROWTH INCREMENT		71	52	43	A3

Table 3.97 Mean lengths, weights and condition factors for each age class of eastern Brook trout in Benewah Creek, 1994.

Age	N	Mean length (mm) ±SD	Mean weight (g) ±SD	Mean K_{tl} ±SD
0+	2	62 ± 16.9	3.0 ± 1.4	1.3 ± 0.4
1+	39	76.6 ± 7.6	3.3 ± 1.3	0.9 ± 0.2
2+	23	127.7 ± 9.7	[illegible]	0 [illegible] 1
3+	32	165.3 ± 17.9	43.6 ± 17.0	0.9 ± 0.2
4+	7	210 ● 19.2	94.6 ± 26.2	1.0 ± 0.2
Total	103			0.91 0.17

Table 3.98 Mean back-calculated lengths at the end of each years growth (**annulus** formation) for each age class of cutthroat trout in Evans Creek, 1994.

	MEAN ± S.D. BACK CALCULATED LENGTH AT ANNULUS				
Cohort	**N**	**1**	**2**	**3**	**4**
1993	46	60.75±9.56			
1992	124	54.5 ±7.34	108.7 ± 15.9		
1991	36	57.9±4.7	117.3 ± 9.5	166.8 ± 96	
1990	15	59.4 ± 4.4	120.6 ± 11.7	171.1 ± 12.5	221.4 ± 22.3
GRAND MEAN	221	56.4± 11.2	111.0 ± 20.1	162.9 ± 29.5	221.4 ± 22.3
MEAN ANNUAL GROWTH INCREMENT		56	55	52	58

Table 3.99 Mean lengths, weights and condition factors for each age class of cutthroat trout in **EvansCreek**, 1994.

Age	N	Mean length ('mm) ±SD	Mean weight (g) ±SD	Mean Ktl ±SD
0+	14	59.1 5.8	2.1 0.7	1.03 0.31
1+	45	**81.9 ± 10.0**	5.1 ± 1.9	0.90 ± **0.19**
2+	122	**120.8 ± 17.9**	16.0i8.8	**0.85 ±** 0.14
3+	33	169.0i14.1	45.65i15.26	0.72 it.11
4+	13	232.4 k23.8	136.1 f46.8	1.07 k0.25
Total	272			**0.89 ± 0.18**

Table 3.100 **Mean back-calculated lengths at the end of each years growth (annulus formation) for each age class of cutthroat trout in Alder Creek, 1994.**

	MEAN ± S.D. BACK CALCULATED LENGTH AT ANNULUS				
Cohort	N	1	2	3	4
1993	23	62.4 ± 5.8			
1992	47	60.0 ± 4.7	108.1 ± 9.1		
1991	16	64.8 ±3.4	118.8 ± 9.4	161.0± 15.2	
1990	6	61.6 ± 1.6	110.4 ± 3.6	150.7 ± 6.2	198.0 ± 7.14
GRAND MEAN	92	61.5 ± 4.9	110.7 ± 9.8	158.2 ± 14.0	198.0 ± 7.14
MEAN ANNUAL GROWTH INCREMENT		62	49	47	40

Table 3.101 **Mean lengths, weights and condition factors for each age class of cutthroat trout in Alder Creek, 1994.**

Age	N	Mean length (mm) ±SD	Mean weight (g) ±SD	Mean K_{tl} ±SD
0+	5	58.0 ± 4.2	3.0 ± 0.0	1.58 ± 0.34
1+	28	76.1± 11.3	4.5 ± 2.4	0.96 ± 0.24
2+	108	121.1 ± 13.2	15.3 ± 5.6	0.83 ± 0.16
3+	41	165.7 ± 17.3	40.2 ± 16.1	0.84 ± 0.13
4+	14	204.8 ± 15.2	77.2 ± 18.7	0.89 ± 0.13
6+	1	325	326	0.95
Total	197			0.88 ± 0.21

Table 3.102 **Mean back-calculated lengths at the end of each years growth (annulus formation) for each age class of eastern Brook trout in Alder Creek, 1994.**

		MEAN ± S.D. BACK CALCULATED LENGTH AT ANNULUS			
Cohort	**N**	**1**	**2**	**3**	**4**
1993	110	53.9 ± 6.7			
1992	158	58.8 ± 6.9	95.5 ± 12.6		
1991	114	59.4 ± 6.7	94.8 ± 14.9	150.1 ± 13.6	
1990	70	61.9 ± 7.9	103.6 ± 16.6	158.9 ± 18.5	198.4 ± 20.9
GRAND MEAN	452	59.0 ± 17.3	100.9 ± 52.1	153.6 ± 16.1	198.6 ± 20.7
MEAN ANNUAL GROWTH INCREMENT		59	42	53	45

Table 3.103 **Mean lengths, weights and condition factors for each age class of eastern Brook trout in Alder Creek, 1994.**

Age	N	Mean length (mm) ±SD	Mean weight (g) ±SD	Mean K_{fl} ±SD
0+	4	53.3 ± 5.4	1.75 ± 0.5	1.15 ± 0.24
1+	108	73.02 ± 8.6	4.16 ± 1.61	1.05 ± 0.23
2+	158	127.9 ± 16.7	19.4 ± 8.3	0.9 ± 0.21
3+	114	166.0 ± 14.1	43.0 ± 13.4	0.9 ± 0.12
4+	70	213.3 ± 20.4	101.9 ± 40.7	1.02 ± 0.23
Total	454			0.96 ± 0.22

Mean lengths, weights, and condition factors for each **age** class of eastern brook trout in Alder Creek are listed in Table 3.103. Mean condition factors for eastern brook trout ranged from 0.9 for 2+ and 3+ ages classes to 1.2 for 0+ agt class with an overall mean of 1 .O.

3.3. Water Quality and Quantity Analysis

Stream discharge measurements, monthly temperature profiles, and seasonal water quality analysis were completed between March through November 1993 and 1994. Stream dischar ge measurements were collected monthly except for March. During March, discharge measurements were collected three times to account for rain-or snow events. Sampling after March was completed monthly but was event orien tated until base flow was established in June. Sampling was then conducted the third week of the month. Temperature profiles were determined on same schedule as discharge measurements. Water quality samples were collected and analyzed monthly and reported as seasonal averages. Spring samples were those samples collected March through May. Summer samples were those samples collected June through August and fall samples were those samples collected September through November, 1993. Precipitation were also obtained for the months March through November and compared to recorded discharge measurements to show the rela nship between precipitation and run-off. Precipitation and average maxin um air temp eratures were obtained from the Plummer field station and the St. Maries fie station. Plummer data was used to determine Lake and Benewah creek conditions, and the St. Maries field station was used to approximate the conditions for Alder and Evans creeks, respectively.

Water quality data was analyzed monthly and reported seasonally. Spring samples were those samples collected March through May. Summer samples were those samples collected June through August, and Fall samples were those samples collected September through November, 1993. For monthly water quality values reference Appendix E.

3.3.1. 1993

Tables 3.104, 3.105, 3.106, and 3.107 shows the calculated discharge measurements, observed temperatures data, recorded precipitation data and average maximum ambient air temperature for Lake, Benewah, Evans, and Alder creeks, respectively during 1993.

The 1993 field season was more of a usual precipitation year for the panhandle of Idaho. Snow packs in higher elevation were average while snow packs in the lower elevation drainages were greater than normal percent. In March three-foot snow packs in lower elevation drainages resulted in higher than

Table 3.104 Stream Discharge, temperature, month to date precipitation values and average maximum air temperature for Lake: Creek, 1993.

Date	Discharge (cfs)	Precipitation (inches)	Average Stream Temp. °F	Average Air Temp. °F
03-09-93	41	1.8	33	36
03-1 6-93	57	0.2	38	46
03-26-93	700	1.0	33	48
04-1 5-93	51	0.8	43	53
05-05-93	840	2.8		55
06-22-93	4	3.7	56	73
07-23-93	6	4.1	60	64
08-23-93	1	0.7	57	79
09-23-93	2	0.8	44	71
1 o-23-93	1	1.1	36	63
11-19-93		1.0		48

Table 3.105 **Stream Discharge, temperature, month to date precipitation values and average maximum air temperature for Benewah Creek, 1993.**

Date	Discharge (cfs)	Precipitation (inches)	Average Stream Temp. °F	Average Air Temp. °F
03-09-93	32	1.8	38	38
03-16-93	69	0.2	40	46
03-26-93	350	1.0	33	48
04-I 5-93	86	0.8	34	53
05-05-93	676	2.8	34	55
06-22-93	3	3.7	60	73
07-23-93	12	4.1	66	64
08-23-93	1	0.7	53	79
09-23-93	<1	0.8	51	71
10-23-93	2	1.1	45	63
11-19-93	4	1.0	33	48

Table 3.106 Stream Discharge, temperature, month to date precipitation values and average maximum air temperature for Evans Creek, 1993.

Date	Discharge (cfs)	Precipitation (inches)	Average Stream Temp. °F	Average Air Temp. °F
03-09-93	20	2	37	38
03-16-93	27	1	39	45
03-26-93	182	1	33	50
04- 15-93	48	2.2		52
05-05-93	456	3.5	34	58
06-22-93	5	2.2	51	75
07-23-93	7	5.5	53	70
08-23-93	4	0.3	53	78
09-23-93	3	0.5	48	71. .
1 o-23-93	2	0.9	43	66
11-19-93	7	0.9	35	47

Table 3.107 **Stream Discharge, temperature, month to date precipitation values and average maximum air temperature for Alder Creek, 1993.**

Date	Discharge (cfs)	Precipitation (inches)	Average Stream Temp. °F	Average Air Temp. °F
03-09-93	12	2	36	38
03-16-93	38	1	37	45.
03-26-93	168	1	33	50
04-15 33	45	2.2	34	52
05-05-93	289	3.5	34	58
06-22-93	3	2.2	55	75
07-23-93	5	5.5	55	70
08-23-93	2	0.3	55	78
09-23-93	1	0.5	48	71
10-23-93	1	0.9	37	66
11-19-93	2	0.9	33	47

Table 3.108 Seasonal (spring) water quality parameters for selected Coeur d'Alene tributaries during 1993.

Location	pH	D.0.	Cond.	Redox	Alk.	NO2	NO3	PO4	TSS	Turbidity
Lake	6.8-7.2	11.8-13.0	.069-.104	332	30-40	.004-.03	1.03-3.58	.36-2.3	42-265	35-195
Benewah	7.0-7.2	13.0-13.5	.042-.060	308	30-50	.01-.03	0-1.28	.07-.40	1-640	40-164
Evans	7.0-7.2	14.5-22.0	.023-.056	291-302	20-30	0-.04	0	.18-.91	3.0-6.7	35->500
Alder	6.8-7.2	.041-.073	10.9-16.4	289	30-40	.02-.07	.02-1.3	.01-.7	18-5940	27-320

*Total dissolved solids and turbidity not determined.

Table 3.109 Seasonal (summer) water quality parameters for selected Coeur d'Alene tributaries during 1993.

Location	pH	D.0.	Cond.	Redox	Alk.	NO2	NO3	PO4	TSS	Turbidity
Lake	7.0-7.2	1.2-15.0	.045-.056	240-299	30	.01-.06	0.-0.0	0.23-0.44	5-280	9-75
Benewah	7.9-7.4	2.2-11.0	.042-.071	260-286	30-50	0.0-.06	0.0	0.12-1.43	2-640	12-87
Evans	266-313	6.7-7.0	10.6-13.8	.009-.035	30	0.0-0.08	0.0	0.0-0.18	2-460	0-30
Alder	270-288	6.3-7.2	9.6-15.7	.091-.092	30-60	.01-.03	0.0-0.06	.01-3.0	6-5940	18-320

*Total dissolved solids and turbidity not determined.

Table 3.110 Seasonal (fall) water quality parameters for selected Coeur d'Alene tributaries during 1993.

Location	pH	D.0.	Cond.	Redox	Alk.	NO2	NO3	PO4	TSS	Turbidity
Lake	7.0-7.2	10.4-15.1	.060-.061	469-942	40-50	0.0-0.03	0.0	0.07-1.92	10-87	18-28
Benewah	6.4-7.5	10.6-14.8	.069-.090	415-939	50	0.0-0.03	0.0	0.0-0.52	30	12-24
Evans	6.7-7.0	10.3-13.8	.000-.035	133-910	40-50	0.0-0.03	0.0	0.07-1.68	2	0-12
Alder	6.3-7.2	9.6-15.7	.091-.092	313-842	50-70	0.0-0.03	0.0-0.04	0.01-1.18	8	18-172

*Total dissolved solids and turbidity not determined.

normal spring discharge profiles. Snow melt began in March when air temperatures began to rise above freezing during daylight hours. This was excerbated by precipitation in the form of rain during the day, snow at night, which resulted in the first rain-on-snow event. The first rain-on-snow event was recorded on March 23 when discharge in all our drainages spiked to 700, 350, 182, and 168 cfs for Lake, Benewah, Evans, and Alder creeks, respectively. Corresponding drops in discharge was reported as precipitation values dropped. Air and water temperatures continued to inc ease, while above normal precipation was received. This resulted in a bankfull flow event for mor f the drainages, except for Lake Creek, which reached flood stage. Dischar, values peaked at 840, 676, 456, and 289 cfs for Lake, Benewah, Evans, and Alder creeks, respectively. Within a month, discharge values in all drainages had dropped significantly with corresponding increases in ambient air and water temperatures. Base flow was achieved in all drainages in October.

Water Quality Analysis

Table 3.108 shows water quality values for the spring sampling period. All parameters were within acceptable limits for fish except for nitrate, phosphates, total suspended sediments, and turbidity. Spring Nitrate values ranged from 0.0 mg/l in Evans Creek to 3.58 mg/l in Lake Creek. Standards for nitrate are 0.4 mg/l. Phosphate values ranged from 0.01 mg/l in Alder Creek to 2.3 mg/l in Lake Creek, EPA accepted standards for phosphate is 0.15 mg/l. Fish appear relatively indifferent to nitrate and phosphate, however both compounds are associated with eutriphication. Excess amounts of these compounds can result in algal blooms which ultimately may result in fish kills. Turbidity and TSS values ranged from 27 NTU's in Alder Creek to >500 NTU's in Evans Creek. Large quantites of suspended sediments can be carried for short periods of time without detriment to fish. However, long exposures to increased suspended sediments results in lowered primary food production. Streams with less than 25 ppm may be expected to support good fresh water fisheries, while streams with values between 80-400 should not be considered good areas for supporting fresh water fisheries.

Table 3.109 shows water quality values for the summer sampling period. All parameters were within acceptable limits for fish except for phosphate. Phosphate values were above ac ptable limits in all four drainages with values ranging from 0.18 mg/l in Evans to 3.0 mg/l in Alder.

Table 3.110 shows water quality values for the fall sampling period. All parameters except for phosphate and TSS were within acceptable limit: Phosphate standard were exceeded in all d-ainages in the fall with va s ranging from 0.52 in Benewah to 1.92 mg/l Lake Creek. Total suspe ed sediment values were above accepted limits of 25 NTU's in Lake Creek at 87 NTU's.

3.3.2. 1994

Table 3.11 l-3.1 14 shows the calculated discharge measurements, observed temperatures data, recorded precipitation data and average maximum ambient air temperature for Lake, Benewah, Evans, and Alder creeks, respectively during 1994.

Discharge and precipitation values for 1994 were lower than normal. This resulted in lower discharge profiles than those reported in 1993. Base flow was achieved earlier than in 1993. All streams reached base flow levels in August except Evans Creek.

Table 3.108 shows water quality values for the spring through fall sampling period. All parameters were within acceptable ranges for cutthroat trout except for phosphate in Lake Creek during the fall sampling period and turbidity values in all drainages, except Evans Creek during the spring sampling period.

3.4. MACROINVERTEBRATE SURVEYS

3.4.1. Hess and Drift Samples

A total of 102 Hess samples were collected in Alder, Benewah, Evans, and Lake Creeks in 1994. Mean annual densities of benthic macroinvertebrates ranged from a low of 181 0/m^2 in Lake Creek to a high of 3180/m^2 in Evans Creek. Mean annual densities in Alder Creek and Benewah Creek were 2270/m^2 and 2280/m^2, respectively (Table 3.118). Macroinvertebrate densities for the study streams are generally comparable or greater than other third order streams in north Idaho. Chironomidae larvae were the most abundant macroinvertebrate in Alder Creek (30.58 percent), Benewah Creek (21.51 percent), and Evans Creek (33.28 percent). Elmidae larvae were the most abundant taxon in Lake Creek (25.22 percent), while aquatic Oligochaetes were the second most abundant taxon (15.24 percent). Heptageniidae were the second most abundant taxon in Alder Creek (11.29 percent), and Evans Creek (15.25 percent), while Baetidae were the second most abundant in Benewah Creek (13.52 percent). These results are similar to those reported in 1991 (Lillengreen, et. al. 1991).

A total of 63 drift samples were collected from study streams in 1994. Mean densities of benthic invertebrates ranged from a low of 53.7/100 m^3 in Benewah Creek, to a high of 249.5/100 m^3 in Alder Creek (Table 3.118). Average densities in Benewah (53.7000 m^3), Evans (223.41100 m^3), and Lake Creek (72-O/100 m^3) were lower than in 1991 (Lillengreen, et al. 1991). while average density in Alder Creek (201.3/100 m^3) was higher. Chironomidae were the most abundant taxon collected in Alder Creek (43.46 percent) and Evans

Table 3.111 Str eam Discharge, temperature, month to date precipitation values and average maximum air temperature for Laka Creek, 1994.

Date	Discharge (cfs)	Precipitation (inches)	Average Stream Temp. °F	Average Air Temp. °F
03-04-94	42.5	2.7	2.0	44
03-21-94	38.4	2.6	2.4	49
04-18-94	18.9	2.0	9.9	56
05-16-94	6.0	1.1	9.6	66
06-22-94	1.8	5.1	15.9	67
07-18-94	0.3	0.8	20.1	79
08-29-94	<0.1	0.1	11.3	89
09-1 9-94	0.5	0.6	14.9	78
1 o-1 7-94	0.6	1.2	5.2	63.
11-15-94	2.9	6.9	1.0	44

Table 3.112 Stream Discharge, temperature, month to date precipition values and average maximum air temperature for Benewah Creek, 1994.

Date	Discharge (cfs)	Precipitation (inches)	Average Stream Temp. °F	Average Air Temp. °F
03-04-94	71.6	2.7	5.0	44
03-21-94	32.1	2.6	2.0	49
04-18-94	2.9	2.0	16.8	56
05-16-94	7.2	1.1	17.4	66
06-22-94	2.4	5.1	28.1	67
07-18-94	2.2	0.8	23.3	79
08-29-94	<0.1	0.1	17.1	89
09-19-94	0.6	0.6	10.2	78
10-17-94	1.3	1.2	7.8	63.
11-15-94	7.5	6.9	1.7	44

Table 3.113 Stream Discharge, temperature, month to date precipitation values and average maximum air temperature for Evans Creek, 1994.

Date	Discharge (cfs)	Precipitation (inches)	Average Stream Temp. °F	Average Air Temp. °F
03-04-94	31.8	1.8	3.5	44
03-21-94	15.7	1.6	3.7	49
04-18-94	32.8	1.2	7.0	59
05-1 6-94	15.7	1.1	8.2	68
06-22-94	2.6	2.8	12.0	71
07-18-94	3.5	0.4	14.0	82
08-29-94	1.8	•	12.7	89
09-19-94	1.4	0.7	11.6	78
10-17-94	1.3	0.5	6.4	*
11-15-94	3.6	*	2.7	•

Table 3.114 Stream Discharge, temperature, month to date precipitation values and average maximum air temperature for Alder Creek, 1994.

Date	Discharge (cfs)	Precipitation (inches)	Average Stream Temp. °F	Average Air Temp. °F
03-04-94	36.3	1.8	32	44
03-21-94	19.0	1.6	1.1	49
04-1 8-94	14.5	1.2	41	59
05-1 6-94	9.0	1.1	9.8	68
06-22-94	1.8	2.8	•	71
07-18-94	•	0.4	•	a2
08-29-94	<0.5	•	16.5	89
09-1 9-94	<0.5	0.7	13.3	78
10-17-94	1.5	0.5	5.7	•
11-15-94	2.8	•	0.9	•

Table 3.115 Seasonal (spring) water quality parameters for selected Coeur d'Alene tributaries during 1994.

Location	pH	D.O.	Cond.	Redox	Alk.	NO2	NO3	PO4	TSS	Turbidity
Lake	6.5-7.4	9.4-13.8	.038-.055	357-385	3-40	0.03	0.0-0.06	0.01-0.07	7	9-40
Benewah	7.0-7.8	8.8-14.1	.040-.057	336-416	5-60	0.0-0.03	0.0-0.0	0.01-0.07	10	9-30
Evans	6.8-7.2	10.9-13.6	0.011-0.022	328-407	4-50	0.02-0.05	0.0	0.01-0.07	6	0.5
Alder	7.5-7.8	11.3-14.0	.039-.067	278-379	5-60	0.1-0.3	0.0-0.0	0.0-0.07	•	5-18

*Parameters not determined.

Table 3.116 Seasonal (summer) water quality parameters for selected Coeur d'Alene tributaries during 1994.

Location	pH	D.O.	Cond.	Redox	Alk.	NO2	NO3	PO4	TSS	Turbidity
Lake	7.3-8.9	7.7-9.7	.020-.040	176-337	40 to	0.05-0.09	0.09	0.12-0.40	•	9-15
Benewah	8.3-10.7	8.2	.059-.094	160-366	35-50	•	0.01-6.0	0.07-0.18	*	12-50
Evans	7.0-8.5	9.2-10.5	0.24-0.28	279-360	35-70	0.03-0.07	0.0	0.01-0.07	•	o-5
Alder	6.7-7.2	7.4-9.2	.076-.096	277-493	50-75	0.04	0.05-0.08	0.07-0.12	*	21-24

*Parameters not determined.

Table 3.117 Seasonal (fall) water quality parameters for selected Coeur d'Alene tributaries during 1994.

Location	pH	D.O.	Cond.	Redox	Alk.	NO2	NO3	PO4	TSS	Turbidity
Lake	7.0-7.2	8.8-11.2	.050-.080	366-455	50-60	0.03-0.060	•	0.18-0.27	•	9-18
Benewah	7.3-7.9	9.3-10.8	.062-.090	338-394	70	.	0.04-0.06	0.07-0.12	•	9-12
Evans	6.9-7.1	9.4-10.6	.030-.031	356-466	50	0.03-0.06	0.0	0.01	.	5
Alder	7.0-7.2	8.3-9.9	.093-.096	277-354	70	0.05	0.06	0.07-0.18	•	15-24

*Parameters not determined.

Table 3.118 Mean density of macroinvertebrates from Hess (#/m^2) and Drift (#/100m^3) samples, 1994. Sample size in parentheses.

Hess Samples

Date	Alder	Benewah	Evans	Lake
	Stream			
June	2720 (9)	2530 (9)	1990 (9)	1890 (9)
August	1850 (9)	890 (9)	3100 (9)	1100 (6)
October	2230 (9)	3420 (9)	4460 (9)	1240 (9)
Annual	**2270 (27)**	2280 (27)	3180 (27)	1810 (21)

Drift Samples

Date	Alder	Benewah	Evans	Lake
	Stream			
June	52.7 (6)	38.7 (6)	49.9 (6)	89.4 (6)
August	624.5 (6)	73.4 (4)	480.1 (6)	24.5 (1)
October	71.3 (6)	30.9 (6)	140.1 (6)	18.1 (4)
Annual	**249.5 (18)**	**53.7 (16)**	223.4 (18)	72.0 (11)

Table 3.119 Shannon-Weiner diversity index and Family-level Biotic Index(FBI) for macroinvertebrate communities, 1994.

Shannon-Weiner

	Stream			
	Alder	**Benewah**	**Evans**	**Lake**
# of Taxa	44	44	43	38
# of Individuals	6122	6155	8599	3806
Index	2.42	2.53	**2.34**	231

FBI

	Stream			
	Alder	**Benewah**	**Evans**	**Lake**
June	3.45	4.32	4.54	4.33
August	5.06	4.76	4.10	4.72
October	4.06		3.00	4.75
Annual	**4.19**	**3.98**	**3.91**	**4.17**

Creek (49.30 percent). Elmidae were the second most abundant taxon in Alder Creek (11.00 percent), while Baetidae were second most abundant in Evans Creek (8.64 percent). Baetidae were most abundant in Benewah Creek (27.37 percent), followed by Chironomidae (26.67 percent). The most abundant taxa in Lake Creek were Heptageniidae and Chironomidae (24.25 percent and 23.75 percent, respectively).

3.4.2. Biological Assessment

Shannon-Weiner diversity values were highest in Benewah Creek (2.53) and lowest in Lake Creek (2.31). Values for Alder and Evans Creeks were 2.42 and 2.34, respectively (Table 3.119). Shannon-Weiner diversity values for drift samples ranged from 2.1 in Evans Creek to 2.25 in Benewah Creek. These values were lower than those reported in 1991 (Lillengreen et al. 1991). Terrestrial invertebrates were not included in the 1994 index calculations and may have resulted in lower diversity values.

Average annual Family-level Biotic Index (FBI) values ranged from 3.91 in Evans Creek to 4.19 in Alder Creek. Values were 3.98 for Benewah Creek and 4.17 for Lake Creek, respectively (Table 3.119). These results suggest that water quality ranges from very good (possible slight organic pollution) to good (some organic pollution probable) in the study drainages. Values calculated from drift samples were slightly higher than those for Hess samples. These values fall within the range reported for similar streams in the region (Lester 1994).

3.5. Analysis of Migration Barriers

A total of 19 culverts were analyzed during 1993 to determine if passage barriers or velocity barriers existed. Only one passage barrier existed, while several potential velocity/distance barriers existed. In the Benewah Creek drainage, a culvert connecting a side tributary, Windfall Creek was determined to be a jumping pool distance barrier. Replacement of this culvert would access 2-3 miles of spawning/rearing habitat for westslope cutthroat trout.

4.0 Discussion

Fisheries resources are an integral part of the Coeur d'Alene Tribe's cultural heritage. Anadromous and resident salmonids were a critical component of the tribes annual subsistence requirements. The Coeur d'Alene Tribe, however, lost their salmon fishery early in the twentieth century with the construction of Chief Joseph and Grand Coulee Dams on the Columbia River. These actions taken by non-tribal entities forced the Coeur d'Alene Tribe to rely solely on the resident fish resources of Lake Coeur d'Alene.

Historical evidence suggests that cutthroat trout were an abundant and extremely important part of the Coeur d'Alene Tribe's resident fishery. Cutthroat trout were the most abundant trout species in the Coeur d' Alene system. Large numbers of cutthroat trout were harvested in Lake Coeur d'Alene by boat fishing, as well as trapping in tributaries during spring spawning runs (Walker 1977; Peltier 1975; Scott 1968). Since 1932, the cutthroat population has declined significantly. The present ecosystem bears little resemblance to habitat composition, diversity and structure of the historic ecosystem.

A literature review determined optimal habitat conditions for cutthroat and bull trout (Graves et al. 1990; Lillengreen et al, 1993). These were then compared to existing conditions reported in the study drainages. Data compiled in 1993 and 1994 included: stream discharge rates, temperature, water quality, available habitat, large woody debris densities, substrate and percentage of fine sediment. Biological data included trout population estimates, biomass estimates, stock assessment, and benthic macroinvertebrate densities. All data were combined to determine factors affecting, and ways to increase, westslope cutthroat and bull trout populations on the Reservation.

4.1 Physical Characteristics

4.1.1 Water Quantity and Quality

In the four study drainages, base flow, temperature, and water quality are limiting the quality of trout habitat. Data collected in 1993 and 1994 indicated that average annual flow values reported were considered poor for maintaining quality trout. Average annual flows of >50 percent are considered excellent for maintaining quality trout habitat, 25-50 percent is considered fair, and base flows less <25 percent is considered poor habitat (Lillengreen et al, 1993; Hickman and Raleigh 1982; Wesche 1980). Lillengreen et al, (1993) reported that average annual flows in 1991 and 1992 were also poor (e.g. Lake Creek values for 1991 and 1992 were 13.4 and 25.2 percent, respectively). Drought conditions have existed during the past four years which may have impacted water yield to streams which may have contributed to these low flow conditions. Data collected indicated that extreme peaks take place during spring run-off followed by iods of extreme low flows. This can be associated with land use practices in rich upland and riparian land clearing results in loss of water retention, and contributes to the "flashy" nature of these drainages.

Based on water temperature data collected during 1993 and 1994 (Tables 3.103, 3.110) it appears that temperatures may be limiting cutthroat trout survival. (Lillengreen et al, 1993) reported that these conditions also existed in 1991 and 1992. Evans and Alder creeks were within acceptable temperature ranges for westslope cutthroat trout in 1993. However, in 1994, both streams exceeded optimal temperature ranges.

Based on results, water quality data is inconclusive. Phosphate, turbidity, total suspended solids, and dissolved oxygen exceeded EPA approved limits reported for optimal trout habitat conditions for short durations. These values may indicate a problem exists with water quality, however, additional data needs to be collected to determine the extent of the potential problem.

4.1.2 Habitat

Current habitat conditions for westslope cutthroat trout in Lake, Benewah, Evans and Alder creeks were determined. Parameters used for evaluation included residual pool depth, average canopy cover, number of large woody debris within wetted perimeter of the channel (instream cover); riffle:pool ratio and average percent fine sediment (< 4 mm). All habitat parameters were measured for each stream reach in each of the four drainages.

Pools are important components of fish habitat because they provide cover, protection and play a role in maintaining optimal temperature conditions for trout. Residual pool depth is defined as the depth of the pool during low flow or no flow conditions. Optimal pool depth for trout habitat can be described as pools greater than 1.5 meters in streams less than 5 meters wide or pools greater than 2 meters deep in streams greater than 5 meters wide (Hickman and Raleigh, 1981). All of the study drainages failed to meet the pool depth requirements for optimum trout habitat (Table 4.1).

Canopy cover is an important component of fish habitat because it provides temperature regulation, controls and maintains watershed erosion and streambank integrity. Average canopy cover between 50-100 percent shade is acceptable for trout habitat in streams less than 50 feet wide (Idyll 1942; Martin et. al. 1981). Stream side buffers of approximately 33 meters in which 80 percent of the buffer is well rooted will maintain adequate erosion control (Raleigh and Duff 1981). All mainstem sections of the drainages lacked sufficient riparian buffers for thermal regulation and bank stability, while forested headwater drainages contained sufficient ripanan buffers to maintained temperature and bank stability (Table 4.1).

The need for large woody debris is widely accepted in the scientific literature, however optimal levels of woody debris reported are variable. Woody debris plays a significant role in channel geomorphology,(i.e. stream stability/habitat diversity) as well as contributes to overwinter fish habitat and plays an important role in summer juvenile cover (Val. Crispen and Roberts, 1993) Large woody debris is also important in the production of benthic invertebrates. Large woody debris is conspicuously absent in most of the four drainages. Removal of woody debris from stream channels, forest management and agricultural practices, and road construction have all contributed to the current conditions. This results in homogeneous stream reaches dominated by riffles and degraded to boulder-bedrock substrate. (Val Crispen and Roberts, 1993). These conditions are evident throughout the four study drainages. All lower mainstem reaches are devoid of large woody debris, while smaller headwater, drainages in forested areas still retain some level of woody debris (Table 4.1).

Riffle pool ratio can be used as an indicator of habitat diversity. An optimal riffle pool ratio also provides for adequate food production. Habitat diversity (complexity) is important for westslope cutthroat trout, especially juveniles (Griffith, 1970; Rieman et al, 1989). Rieman et al (1989) reported that manipulation of stream complexity by artificially increasing the amount of lateral habitat resulted in a proportional increase in cutthroat numbers. Lere (1982) found westslope cutthroat trout densities were correlated to pool riffle periodicity. Optimal pool-riffle ratios that provide an optimal proportion of rearing and food producing areas are 1:1 (Hynes, 1970; Raleigh et. *al.* 1982; Rieman and Apperson 1989). Average riffle:pool ratio for the four study drainages did not meet this target value. Most all drainages, with the exception of Alder Creek had riffle:pool ratios of greater than 1 :1. (Table 4.1).

Substrate size and the amount of fine sediment are important to cutthroat trout for spawning success, food production, overwintering and rearing habitat. For successful spawning and reproduction, cutthroat trout require an adequate amount of gravels between 2.0 and 6.0 cm in diameter with less then 10 percent fine sediments. Substrate is also important in overwintering habitat. For optimal winter and escape cover of fry and juveniles, 10 percent of the substrate ranges between 1040 centimeters in diameter (Hickman and Raleigh, 1981). Small fish utilize substrate for hiding and in extreme environmental conditions, such as high velocities and ice formation, fry and subadults bun-ow into substrate (Everest, 1969, Bjorn et al 1982). Fine sediment also contributes to the reduction of carrying capacity of essential pool habitat and can eventually eliminate pool habitat (Bjom et al 1977; Rhodes and Jone 1991). Average percent fines for all drainages were above the recommended 10 percent fines value (Table 4.1).

Table 4.1. Current (1994) and optimal habitat conditions for westslope cutthroat trout.

Habitat Characteristic	*Lake Creek*	*Benewah Creek*	Evans *Creek*	*Alder Creek*	**Optimal Condition**
Average Residual Pool Depth	(1993) 0.5 m (1994) 0.5 m	0.6 m 0.6 m	0.5 m 0.4 m.	0.6 m 0.4 m	1.5 m
Average Canopy Cover	(1993) 6.9% (1994) 30.2%	30.3% 27.0%	50.9% 43.3%	24.8% 34.2%	75%
# Large Woody Debris/Lineal Distance	(1993) .3/m2 (1994) .5/m2	4.9/m2 7.6/m2	3.3/m2 6.9/m2	0.1/m2 .8/m2	
Riffle: Pool Ratio	(1993) 2.7:1 (1994) 2.8:1	1.4:1 3.2:1	1.4:1 1.5:1	1.3:1 4.2:1	1:1
Average Percent Fine Sediment	(1993)18.8% (1994)11.0%	5.6% 15.6%	13% 14.2%	12.8% 11.4%	<10%

4.2 Biological Assessment

Cutthroat trout populations within their native range are considered to be declining region wide. The range of native trout have been severely reduced in the drainages of the Coeur d' Alene Indian Reservation. Multiple drainages that historically contained westslope cutthroat trout are currently devoid of viable populations. However, viable populations of cutthroat trout currently exist within selected study drainages. Bull trout are currently classified as a Category 1 species and are being considered by the U.S. Fish and Wildlife Service for listing as threatened or endangered. Baseline surveys on the Coeur d' Alene Indian Reservation revealed a conspicuous absence of bull trout (Lillengreen 1993).

Habitat use evaluation information indicated that cutthroat trout populations were selecting for certain habitat types (i.e. plunge pool) thus, indicating that all available habitat was not being utilized. Chi-square goodness of fit tests and analysis of catch rates indicated that cutthroat and brook trout were not distributed uniformly among available habitat types in the four study drainages. Drainage specific catch rate showed considerable variation in selection of habitat types, whereas combined catch rates for both cutthroat and brook trout showed a strong selective tendency for deep water habitat with slower velocities. Cutthroat trout densities were highest in plunge pool habitat for all drainages except Alder Creek in which densities were highest in glide habitat. Not enough information was collected to determine why cutthroat trout selected for specific habitat types. Literature reports that habitat quality is related to depth and cover components (Hickman and Raliegh, 1981). Assumptions could be made that habitat types selected by cutthroat trout in this study contained adequate depth and cover requirements. However, more data needs to be collected and will be addressed in future monitoring efforts.

Population and density estimates indicated that cutthroat trout populations and densities were below those reported in literature. Irving (1987) summarized several studies and concluded that "good" rearing habitat may support up to 200 fry/100 m^2. Mean densities may approach 20 fish /100 m^2 for age one and two fish. Mean densities in all drainages ranged from 0.4 fish/100 m^2 to 4.7 ctt/100 m^2. Some headwater reaches contained cutthroat trout densities that fell within the "good" rearing habitat range as reported by Irving (1987). However, cutthroat trout densities reported in mainstem drainages were well below those values reported by Irving (1987).

In order to assess habitat restoration alternatives, an accurate stock assessment needs to be completed. Part of this stock assessment is identifying the adfluvial, fluvial, and resident components of the population. Migratory analysis in combination with age and growth analysis indicated that an adfluvial stock of westslope cutthroat trout potentially existed in Lake Creek (Lillengreen *et. al.* 1993). Benewah Creek also contained a large number of adult westslope cutthroat trout migrants. However, determination of adfluvial or fluvial origin based on back calculated lengths was inconclusive. Fish trapped in the Alder and Evans creek drainages accounted for less than 10 percent of the total catch. No trout species were caught in the Evans Creek trap, while three mature adults were captured in Alder Creek. Stock determination was inconclusive with data collected. Further investigations need to be conducted.

4.3 Conclusion

Habitat degradation of riparian/stream ecosystems are a result of the cumulative effects of trapping, livestock grazing, dam construction, logging, mining, the introduction of exotic species, channelization, urbanization, road construction, irrigation withdrawals, etc. In many instances, these cumulative effects, over time, have harmed the native fisheries because of their potential to alter ecosystem processes (Platts, 1991; Swanston, 1991). For example, severe prolonged reduction of riparian vigor may result in loss of bank stability, creating a long term source of sediment. A shift in the equilibrium between streamflow and sediment will produce a change in bar profile and bedload transport. When transport capacity is exceeded aggradation occurs and there is a decrease in bed material size (Leopold et al. 1964; Kappesser, 1992). The relationship between aquatic communities and specific habitat parameters (e.g. stream flow, water quality, substrate size) is such that anthropogenic disturbance, which vanes from the natural disturbance regime, can significantly alter the producti‧ity of ecosystems by affecting species composition and diversity (Bjom et al., 19‾ Brusven and Prather, 1974; Hausle and Coble, 1976). Conditions currently existing in study drainages are characterized by declines in biological diversity and ecosystem productivity, and are the focus of interest for restoration efforts on the reservation.

Given this scenario and the limitations placed upon it by current management activities and conflicting economic demands, the following goals and o ;ectives have been identified for the Coeur d' Alene Tribe fisheries enhancement program:

- Reestablish and protect self-sustaining populations of native cutthroat and bull trout which were historically prominent in the Lake Coeur d' Alene system.
- Develop and maintain continuous, healthy riparian corridors which support the full range of ecological and hydrological processes.
- Manage the riparian/aqua tic interface for both wildlife and limited domestic use, while protecting water quality, public health, and the fisheries resource.
- Create long-term fishing opportunities for the local community.
- Develop and coordinate community and agency coalitions which would address issues related to habitat restoration.
- Develop agreements with private landholders to implement site specific restoration projects and encourage commitments to cost-sharing opportunities.

In order to achieve the above goals the Coeur d'Alene Tribe has identified the following objectives;

1. Conduct an extensive habitat restoration program in four major drainages on the Reservation which includes; Lake Benewah, Evans and Alder Creeks.
2. Develop harvest opportunities for the local community through a sustainable cutthroat trout fishery and an interim put and take rainbow trout pond program.
3. Purchase "critical watershed areas" for protection of fisheries habitat.

4. Educate and inform the public about issues related to cutthroat and bull trout habitat restoration.

5. Design, construct, operate and maintain a trout production facility on the Coeur d'Alene Reservation and

6. Implement a five-year monitoring program to evaluate the effectiveness of the above recommendations.

In order to protect stocks of westslope cutthroat trout restrictive fishing regulations have been adopted by the Coeur d'Alene Tribe. Complete stream fishing closures exist in Benewah and Lake creeks, while limited harvest opportunities exist in Alder and Evans creeks. These restrictive regulations will protect declining stocks from mortality due to angler harvest during spawning migrations. The Idaho Department of Fish and Game also has a moratorium on bull trout harvest in the Lake Coeur d'Alene Drainage as well as restrictive regulations pertaining to the harvest of westslope cutthroat trout.

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Appendix A

Appendix A.1. Summary of Lake Creek channel type survey, 1993.

Reach Num	Reach Location	Channel Type	Entrench-ment	Width/Depth Ratio	Sinuosity	Stream Gradient	Dominant Substrate
1	Mainstem	C6	Slight	Mod - High	High	1	Silt
2	Mainstem	C4	Slight	Mod - High	High	1	Gravel
3	Mainstem	B3	Moderate	Moderate	Moderate	3-4	Cobble
4	Mainstem	C3	Slight	High	High	2	Cobble
5	Mainstem	B3	Moderate	Moderate	Moderate	3	Cobble
6	Mainstem	C4-C6	Slight	Mod - High	High	1	Gravel-Silt
7	Mainstem	E6	Slight	Very Low	Very High	1	Silt
8	Mainstem	E5	Slight	Very Low	Very High	1	Sand
8b	West	E5-C5	Slight	Very Low	Very High	1	Sand
9b	west	E6	Slight	Very Low	Very High	1	Silt
10b	West	B4a	Moderate	Moderate	Moderate	5	Gravel

Appendix A.2. Summary of Benewah Creek channel type survey, 1993.

Reach Num	Reach Location	Channel Type	Entrench-ment	Width/Depth Ratio	Sinuosity	Stream Gradient	Dominant Substrate
1	Mainstem	C3	Slight	39.0	High	2	Cobble
2	Mainstem	B2a	Moderate	13.0	Moderate	4	Boulder
3	Mainstem	C2b	Slight	15.0	High	2	Boulder
4	Mainstem	B3c	Moderate	27.5	Moderate	2	Boulder
5	Mainstem	C1b	Slight	21.3	High	4-5	Bedrock
6	Mainstem	C3	Slight	20.0	High	1	Cobble
7	Mainstem	C3	Slight	17.6	High	1	Cobble
8	Mainstem	C6	Slight	26.2	High	1	Cobble

Appendix A.2. (continued): **Summary of Benewah Creek channel type survey, 1993.**

Reach Num	Reach Location	Channel Type	Entrench-ment	Width/Depth Ratio	Sinuosity	Stream Gradient	Dominant Substrate
9	Mainstem	C5	Slight	13.3	High	<1	Sand
10	Mainstem	C6	Slight	13.3	High	1	Silt
11	Mainstem	E6	Slight	3.9	Very High	<1	Silt
12	Mainstem	C5-C6	Slight	—	High	<1	Sand-Silt
13	Mainstem	E4	Slight	6.0	Very High	2	Gravel
13a	West Fork	E4	Slight	10.0	Very High	2-3	Gravel
14a	West Fork	E3b	Slight	12.0	Very High	3 4	Cobble

Appendix A.3. **Summary of Evans Creek channel type survey, 1993.**

Reach Num	Reach Location	Channel Type	Entrench-ment	Width/Depth Ratio	Sinuosity	Stream Gradient	Dominant Substrate
1	Mainstem	C6	Slight	–	High	<1	Silt
2	Mainstem	C3	Slight	7.8	High	1	Cobble
3	Mainstem	E3b	Slight	–	Very High	3	Cobble
4	Mainstem	B3b	Moderate	–	Moderate	–	Cobble
5	Mainstem	A4	Moderate	17.3	Moderate	7	Cobble-Boulder
6	Mainstem	A2a	High	8.4	Low	10	Boulder-Cobble
7	Mainstem	B3a	Moderate	14.4	Moderate	9	Cobble
5a	North Fork	B3a	Slight	6.3	Moderate	8	Cobble-Boulder

Appendix A.3. (continued): **Summary of Evans Creek channel type survey, 1993.**

Reach Num	Reach Location	Channel Type	Entrench-ment	Width/Depth Ratio	Sinuosity	Stream Gradient	Dominant Substrate
5b	South Fork	A 2	High	11.1	Low	7-10	Gravel
6b	south Fork	B3a	High	6.3	Low	16	Boulder-Cobble

Appendix A.4. **Summary of Alder Creek channel type survey, 1993.**

Reach Numb	Reach Location	Channe l Type	Entrench-ment	Width/Depth Ratio	Sinuosity	Stream Gradient	Dominant Substrate
1	Mainstem	B3	Moderate		Moderate	2	Cobble
2,3,4	Mainstem	A2-A3	High	11.5	Low	3	Boulder-Cobble
5,6	Mainstem	E3b	Slight	11.3	High	2.5	Cobble
7	Mainstem	C3	Slight	>12	High	1.5	Cobble
8	Mainstem	C6	Slight	12.5	High	<1	Silt
9	Mainstem	E3b	Slight	4.4	Very High	1	Cobble
1a	North Fork	E3b	Slight	4.6	Very High	3	Cobble
2a,3a	North Fork	B3a-D3b	Moderate	5.6 -- >40	Moderate	2.5	Cobble
4a	North Fork	B3a	Moderate	6	Moderate	5	Cobble

Appendix B

Table B.1 Lake Creek Stream Reach Inventory and Channel Stability Evaluation Summary.

	1993		1994	
Reach	Stability	Rating	Stability	Rating
1	113	Fair	73	Good
2	89	Fair	93	Fair
3	103	Fair	80	Fair
4	100	Fair	86	Fair
5	71	Good	101	Fair
6	101	Fair	95	Good
7	118	Poor	79	Fair
8	119	Poor	117	Poor
8b	129	Poor	102	Fair
9b	112	Fair	113	Fair
10b	87	Fair	83	Fair

Table B.2 Benewah Creek Stream Reach Inventory and Channel Stability Evaluation Summary.

	1993		1994	
Reach	Stability	Rating	Stability	Rating
1	94	Fair	83	Fair
2	74	Good	80	Fair
3	67	Good	67	Good
4	60	Good	78	Fair
5			48	Good
6	65	Good	59	Good
7	77	Fair	96	Fair
8	82	Fair	74	Good
9	122	Poor	90	Fair
10	100	Fair		
11	125	Poor	117	Poor
12	129	Poor	115	Poor
13	83	Fair	107	Poor
13a	77	Fair	92	Fair
14a	75	Good		

Table B.3 Evans Creek Stream Reach Inventory and Channel Stability Evaluation Summary.

	1993		1994	
Reach	Stability	Rating	Stability	Rating
1	124	Poor	125	Poor
2	119	Poor	101	Fair
3	95	Fair	94	Fair
4	77	Fair	86	Fair
5	67	Good	73	Good
6	65	Good	72	Good
7	70	Good		
5a	73	Good	83	Fair
5b	86	Fair	84	Fair
6b	66	Good	80	Fair

Table B-4 Alder Creek Stream Reach Inventory and Channel Stability Evaluation Summary.

	1993		1994	
Reach	Stability	Rating	Stability	Rating
1	88	Fair	76	Good
2	82	Fair	78	Fair
3	73	Good	80	Fair
4	73	Good	65	Good
5	82	Fair	81	Fair
6	53	Good	72	Good
7	79	Fair	90	Fair
8	128	Poor	118	Poor
9	103	Fair	80	Fair
1a	58	Good	79	Fair
2a	89	Fair	102	Fair
3a	105	Fair	93	Fair
4a	51	Good	78	Fair

Appendix C

Appendix C.I. Results of Riffle Armour Stability Surveys for Lake Creek, 1993/1994.

Reach	Sample	Index Value		Geometric Mean		Percent < 4 mm	
Number	Number	1993	1994	1993	1994	1993	1994
2	1	62.0		69		28.4	
	2	78.1	96.8	96	142	34.0	3.1
	3	48.0	88.0	98	139	10.4	5.9
3	1	75.8	80.3	119	107	21.3	10.8
	2	58.0	77.9	150	134	19.6	11.3
	3	65.8	52.0	165	152	11.2	19.4
4	1	78.0	69.1	153	148	24.6	17.5
	2	67.4		120		26.6	
	3	72.9	69.6	133	134	40.7	9.5
5	1	52.6	69.5	94	171	37.3	15.7
	2	59.1	82.5	144	176	16.8	14.4
	3	33.6	66.9	101	173	19.9	26.9
6	1	74.2	81.4	130	151	34.5	34.0
	2	74.6	78.3	85	134	54.5	22.5
	3	71.6	84.5	115	142	55.5	23.1
7	1	80.4	68.0	123	113	46.7	43.1
	2	96.1	88.6	98	139	81.2	61.7
	3	90.6	95.8	86	121	83.7	31.7
10b	1	62.6		61		17.5	
	2	62.6		61		17.5	
	3	66.0		53		30.0	

Appendix C.2 Results of Riffle Armour Stability Surveys for Benewah 1993/1994.

Reach	Sample	Index Value		Geometric Mean		Percent < 4 mm	
Number	Number	1993	1994	1993	1994	1993	1994
1	1	79.5	89.8	130	130	26.4	24.8
	2	69.3	68.9	133	175	8.7	12.3
	3	82.4	87.1	136	152	1.5	27.3
2	1		24.1		129		5.3
	2		67.1		126		11.7
	1		38.9		132		14.7
3	2	52.3	2.7	126	135	11.3	2.4
		44.7	43.0	131	152	5.5	6.7
	3	55.5	86.7	162	138	5.8	9.4
4	1	38.2	82.0	97	124	2.5	11.0
	2	53.3	78.8	[illegible]	131	[illegible]	12.7
	3	45.5	83.4	112	131	6.9	11.1
6	1	44.8	66.8	127	148	10.0	15.3
	2	43.0	28.9	107	129	13.5	9.8
	3	62.3	85.7	134	122	9.0	10.6
7	1	60.2	77.0	142	94	14.5	17.2
	2	27.0	69.6	79	117	13.3	9.3

Appendix C.2 (continued): **Results of Riffle Armour Stability Surveys for Benewah 1993/1994.**

Reach	Sample	Index Value		Geometric Mean		Percent < 4 mm	
Number	Number	1993	1994	1993	1994	1993	1994
	3	45.1	92.7	127	117	11.2	20.0
8	1	41.6	70.5	108	164	9.8	27.5
	2	33.0	76.2	63	123	5.0	8.2
	3	72.4	68.9	154	124	9.2	8.5
13a	1	49.5		78		20.1	

Appendix C.3 **Results of Riffle Armour Stability Surveys for Evans Creek, 1993/1994.**

Reach	Sample	Index Value		Geometric Mean		Percent < 4 mm	
Number	Number	1993	1994	1993	1994	1993	1994
2		75.2	91.4	44		35.7	3.5
	2	39.8	97.5	71	139	2.0	10.3
	3	62.5	89.4	82	154	4.5	6.1
3	1	67.3	84.0	87	130	11.8	24.2
	2	82.2		113		17.3	
	3	59.6	91.5	94	141	23.2	13.5
4	1	59.1	90.3	95	172	11.5	25.8
	2	61.0	92.6	76	183	10.0	22.6
	3	56.7	84.6	81	137	16.0	17.0
5	1	42.5	60.0	73	121	20.9	16.5
	2	51.8	61.9	77	113	23.3	13.1
	3	31.4	64.3	76	135	20.8	11.1
5b	1	63.4	64.8	71	54		37.9
	2	84.6	78.3	93	79		39.5
	3	71.8		75			

Appendix C.4 **Results of Riffle Armour Stability Surveys for Alder Creek, 1993/1994.**

Reach	Sample	Index Value		Geometric Mean		Percent < 4 mm	
Number	Number	1993	1994	1993	1994	1993	1994
1	1	31.9	58.0	57	135	7.7	11.3
	2	37.9	68.6	58	141	7.1	11.1
	3	28.5	39.2	62	132	11.0	6.2
3	1	33.4	62.[illegible]	66	161	13.9	10.1
	2	24.8	6[illegible]	62	163	5.1	10.3
	3	15.6	50.[illegible]	54	156	2.8	11.1
5	1	27.8	59.7	46	173	6.5	9.2
	2	40.3	46.2	52	146	11.0	11.4
	3	30.5	71.1	47	167	11.2	7.6
7	1	83.2	68.8	123	96	19.8	22.3
	2	66.6	87.8	83	154	14.6	14.9

Appendix C.4 (continued): Riffle Armour Stability Surveys for Alder Creek, 1993/l 994.

Reach	Sample	Index Value		Geometric Mean		Percent < 4 mm	
Number	Number	1993	1994	1993	1994	1993	1994
	3	90.8	55.5	66	123	25.6	16.9
1a	1	55	80.1		107		32.3
	2	79.4	85.8	64	107	23.5	26.9
	3	50.7	72.1	43	98	20.2	30.5
2a	1		69.3		58		36.1
3A	1	65.9	45.6	43	47	29.4	22.9
	2	76.7	65.6	48	43	30.1	34.6
	3		46.2		50		19.7
4A	1	45.0		42		22.0	
	2	39.5		45		15.1	
	3	37.5		30		21.6	

Appendix D

Appendix D.I. Summary report for Reach # 2 of the Lake Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,180 - 2,260 ft	same
Total length	5,093 ft	6,260 ft
Stream order	4	4
Mean stream gradient	0.6	3.6
Riffle/pool ratio	3.0 : 1	1.6: 1
Land use		
Forest		
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain	100%	100 %
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100 %
Seal stage		
Grass/forb	45.6 %	45.6 %
Shrub		
Pole		
Young		
Mature	54.4 %	54.4 %
Old growth		
Other		
x Canopy cover	11.6	46.7
#Woody debris		
Logs	49	48
Root wads	0	5

Appendix D.2 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 2 for Lake Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater	1	**2.9**	**275.1**	**2.1**	
Glide	**6**	**17.0**	**2,090**	**16.3**	
Run					
Low gradient riffte	**14**	**40.0**	**7,276**	**56.9**	
Total Riffles	21	59.9	9,542.0	**75.3**	
Dammed pool	1	**2.9**	**541.2**	**4.2**	
Eddy pool					
Plunge pool					
Scour pool	**12**	**34.3**	**924**	**7.2**	**0.6**
Scour hole					
Beaver pond	1	**2.9**	**1,689**	**13.2**	**0.6**
Total Pools	**14**	40.1	3,155	**24.6**	
Secondary channel					
GrandTotals	**35**	100.0	12,792.0	99.9	

Appendix D.3 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 2 for Lake Creek during 1994.**

Habit Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	**2**	**4.2**	**2.292**	**7.9**	
Slip face cascade	1	**2.1**	**112**	**0.4**	
Total Cascades	**3**	**6.3**	2,404	**8.3**	
Pocketwater	1	**2.1**	**1,372**	**4.8**	
Glide	**5**	**16.6**	**3,734**	**12.9**	
Run					
Low gradient riffle	**21**	**44.7**	**17,639**	**61.1**	
Total **Riffles**	**27**	**63.4**	**22,745**	**78.8**	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	**11**	**23.4**	**2,475**	**8.6**	**0.7**
Scour hole	**6**	**12.8**	**1,242**	**4.3**	**0.5**
Beaver pond					
Total Pools	17	**36.2**			
3,717Sl29econdary channel					
Grand Totals	**47**		**28,866**		

Appendix D.4. . Summary report for Reach # 3 of the Lake Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,060 - 2,350	
Total length	6,346 ft	4,809 ft
Stream order	4	4
Mean stream gradient	1.5	1.8
Riffelpoolratio	1.8:l	1.6 : 1
Land use		
Forest		
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain	100%	100%
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	loo %	100%
Seral stage		
Grass/forb		
Shrub	loo %	100%
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	18	21
#Woody debris		
Logs	3	10
Root wads	1	0

Appendix **D.5** **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 3 for Lake Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	1	9.1	290.2	2.3	
Run					
Low gradie- 4e	6	54.6	11.762.2	93.7	
Total Riffle:	7	63.7	**12,052.4**	98.0	
Dammed poo.					
Eddy pool					
Plunge pool					
Scour pool	4	36.4	502.8	4.0	0.6
Scour hole					
Beaver pond					
Total Pools	4	35.4	502.8	4.0	
Secondary channel					
Grand Totals	**11**	**.00.0**	**12,555.0**	**100.0**	

Appendix D.6 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 3 for Lake Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	3	12	1.179	3.4	
Slip face cascade					
Total Cascade	3	12	1,179	3.4	
Pocketwater	2	8	2,721	7.9	
Glide					
Run					
Low gradient riffle	12	48	28,623	83 [illegible]	
Total Riffles	14	56	31,344	90.9	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	4	16	998	2.9	0.4
Scour hole	3	12	873	[illegible]	0.3
Beaver pond					
Total Pools	7	28	1,871		
Secondary channel					
Grand Totals	25		**34,499**		

Appendix D.7. . Summary report for Reach # 4 of the Lake Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	**2,350 - 2,410 ft**	
Total length	**4,048 ft**	**2,583 ft**
Stream order	**4**	**4**
Mean stream gradient	**2.0**	**3.0**
Riffle/pool ratio	**2.9 : 1**	**1.6 : 1**
Land use		
Forest	92.2 %	92.2 %
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)	7.8 %	7.8 %
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb	27.5 %	27.5 %
Shrub		
Pole (shrub ?)	72.5 %	72.5 %
Young		
Mature		
Old growth		
Other		
x Canopy cover	0.0	**10 %**
# Woody debris		
Logs		4
Root wads		0

Appendix D.8 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 4 for Lake Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	4	12.9	2,737.l	12.3	
Slip face cascade					
Total Cascades	4	12.9	2,737.1	12.3	
Pocketwater					
Glide	5	16.1	4.737.1	21.3	
Run					
Low gradient riffle	15	48.4	13,776-l	62.1	
Total Riffles	20	64.5	18,502.3	83.4	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	6	19.4	814.7	3.7	
Scour hole	1	3.2	131.7	0.6	
Beaver pond					
Total Pools	7	22.6	946.4	4.3	
Secondary channel					
Grand Totals	31		22,185.6		

Appendix D.9 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 4 for Lake Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	2	6.7	1,652	6.7	
Slip face cascade					
Total Cascades	2	6.7	1,652	8.7	
Pocketwater					
Glide	1	6.7	643	3.4	
Run					
Low gradient riffle	7	46.0	16.003	84.0	
Total Riffles	8	52.7	16,646	87.4	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	5	33	748	3.9	0.5
Scour hole					
Beaver pond					
Total Pools	5	33	748	3.9	
Secondary channel					
Grand Totals	15		19,945		

Appendix D.10. Summary report for Reach # 5 of the Lake Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,410 - 2,450 ft	same
Total length	1,603 ft	3,902 ft
Stream order	4	4
Mean stream gradient	1.0 %	1.5%
Riielpool ratio	2.9 : 1	8.1 : 1
Land use		
Forest	100 %	100 %
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential.right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100%
Seal stage		
Grass/forb	61.6	61.6
Shrub		
Pole		
Young		
Mature	38.4	38.4
Old growth		
Other		
x Canopy cover	18.5 %	26 %
#Woody debris		
Logs	5	4
Root wads		

Appendix D.11 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 5 for Lake Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	4	33.3	2,372.3	28.4	
Run					
Low gradient riffle	5	41.7	4,812.2	57.6	
Total Riffles	9	75.0	7,184.5	86.0	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	3	25.0	1.172.9	14.0	0.31
Scour hole					
Beaver pond					
Total Pools	3	25.0	1,172.9	14.0	
Secondary channel					
Grand Totals	12		8,357.4		

Appendix D.12 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 5 for Lake Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	7	39	5,574	29.9	
Run					
Low gradient riffle	9	50	12,456	668	
Total Riffles	16	89	18,030	96.7	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool					
Scour hole	2	11.1	626	3 4	0.5
Beaver pond					
Total Pools	2	11.1	626	3.4	
Secondary channel					
Grand Totals	18		18,656		

Appendix 0.13. . **Summary report for Reach # 6 of the Lake Creek Watershed data collected during 1993 and 1994.**

Parameter	1993	1994
Elevation	**2,450 - 2,480 ft**	same
Total length	*8,705* ft	*8,248ft*
Stream order	4	4
Mean stream gradient	1.7	1.3
Rifflelpool ratio	2.9 : 1	2.1 : 1
Land use		
Forest	**80.4**	**80.4**
Agriculture	**19.6**	**19.6**
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	**100 %**	**100 %**
Seral stage		
Grass/forb	**28.8**	**28.8**
Shrub	**2.9**	**2.9**
Pole		
Young		
Mature	68.3	68.3
Old growth		
Other		
x Canopy cover	0	26.5
# Woody debris		
Logs	**16**	**10**
Root wads	2	0

Appendix 0.14 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 6 for Lake Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	42	30.9	20,069	39.3	
Run					
Low gradient riffle	57	41.9	21,954	43.0	
Total Riffles	99	72.8	42,023	82.3	
Dammed pool	1	0.7	692	1.4	0.8
Eddy pool					
Plunge pool					
Scour pool	32	23.5	7,737	15.2	0.6
Scour hole	1	0.7	434	0.9	0.8
Beaver pond					
Total Pools	34	24.9	8,863	17.5	0.7
Secondary channel					
Grand Totals	136		51,031		

Appendix D.15 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 6 for Lake Creek during 1994.**

Habit Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	11	20.8	9,566	14.9	
Run					
Low gradient riffle	25	47.1	26,175	40.8	
Total Riffles	36	67.9	35,741	55.7	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	11	20.8	4,785	7.5	0.4
Scour hole	4	7.5	1,878	2.9	0.6
Beaver pond	2	3.8	21,766	33.9	0.6
Total Pools	17	32.1	28,429	44.3	
Secondary channel					
Grand Totals	53		64,171		

Appendix D.16 Summary report for Reach # 7of the Lake Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,480 - 2,600 ft	same
Total length	16,365 ft	18,828 ft
Stream order	4	4
Mean stream gradient	1.5	same
Riffle/pool ratio	2.6 : 1	2.3 : 1
Land use		
Forest	9.1	9.1
Agriculture	82.6	82.6
Livestock grazing	8.3	8.3
Mining		
Wetland		
Floodplain		
Other (includes residential.right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100 %
Seal stage		
Grass forb	58.3	58.3
Shrub	41.7	41.7
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	0	45.8
# Woody debris		
Logs	48	168
Root wads	1	4

Appendix 0.17 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 7 for Lake Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	19	44.2	40.547.5	82.6	
Run					
Low gradient riffle	12	27.9	5,674.3	11.6	
Total Riffles	31	72.1	46,221.8	94.2	
Dammed pool	4	9.3	1,475.8	3.0	0.6
Eddy pool					
Plunge pool					
Scour pool	6	14.0	1,146.4	2.3	0.7
Scour hole	2	4.7	252.0	0.5	0.5
Beaver pond					
Total Pools	12	28.0	2,874.2	5.8	
Secondary channel					
Grand Totals	43	100.1	49,096.o	100.0	

Appendix D-18 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 7 for Lake Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater	1	2.5	181	0.2	
Glide	16	40	44,509	57.3	
Run					
Low gradient riffle	11	27.5	14,911	19.3	
Total Riffles	28	70	59,601	766	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	5	12.5	2,282	2.9	0.4
Scour hole					
Beaver pond	7	17.5	15,740	20.3	0.4
Total Pools	12	30	18,022	23.2	
Secondary channel					
Grand Totals	40		77,625		

Appendix D.19. Summary report for Reach # 1 of the West Fork Lake Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,540 - 2,570	same
Total length	10,132 ft	10,712 m
Stream order	3	3
Mean stream gradient	1.0	1.2
Riffle/pool ratio	2.4: 1	1.9: 1
Land use		
Forest	68.7	68.7
Agriculture	19.7	19.7
Livestock grazing	11.6	11.6
Mining		
Wetland		
Floodplain		
Other (includes residential.right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100 %
Seral stage		
Grass/forb	16.2	16.2
Shrub	58.9	58.9
Pole	15.1	15.5
Young	9.9	9.9
Mature		
Old growth		
Other		
x Canopy cover	0	35.4
#Woody debris		
Logs	28	18
Root wads	0	0

Appendix D.20 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 1 for West Fork Lake Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater	1	**2.9**	**674**	**3.7**	
Glide	**9**	**26.5**	**3,521.4**	**19.1**	
Run					
Low **gradient rime**	**14**	**41.2**	**13,904.7**	**75.4**	
Total Riffles	24	70.6	18,100.l	98.2	
Dammed pool					
Eddy pool					
Plunge pool	5	**14.7**	**182.6**	**1.0**	
Scour pool	5	14.7	**160.3**	**0.9**	
Scour hole					
Beaver pond					
Total Pools	10	29.4	342.9	1.9	
Secondary channel					
Grand Totals	34	100	18,443.O	100.1	

Appendix D.21 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #1 for West Fork Lake Creek during 1994.**

Habitat Type	Freauencv	% Frequency	Total Area (sq. meters)	% Area	Residual +I depth (m)
Rapid					
Step pool cascade	1	**1.9**	366	2.1	
Slip face cascade					
Total Cascades	1	1.9	366	2.1	
Pocketwater					
Glide	**125**	22.6	5,384	**31.7**	
Run					
Low gradient riffle	**22**	41.5	**10,220**	**60.1**	
Total Riffles	147	64.1	15,604	**91.8**	
Dammed pool					
Eddy pool					
Plunge pool	1	**1.9**	IO	0.6	0.6
Scour pool	**13**	**24.5**	**607**	36	**0.4**
Scour hole	**4**	**4.5**	**317**	1.9	**0.5**
Beaver pond					
Total Pools	18	**30.9**	**934**	6.1	
Secondary channel					
Grand Totals	**53**		**17,003**		

Appendix 0.22 Summary report for Reach # 2 of the West Fork Lake Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,570 - 2,970 ft	same
Total length	2,893 ft	7,556 ft
Stream order	3	4.1
Mean stream gradient	4.0	4.1
Rifflepoolratio	NA	1 :1.7
Land use		
Forest	100%	100%
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential right of way, etc.)		
Vegetative type		
Decidious		
Coniferous	6	6
Mixed	93	93
Seal stage		
Grass/forb		
Shrub		
Pole		
Young	100	100
Mature		
Old growth		
Other		
x Canopy cover	77	41
# Woody debris		
Logs	106	48
Root wads	13	4

Appendix 0.23 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth ant lolume values for Reach # 2 for West Fork Lake Creek dur ing 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	**2**	**33.3**	**412.1**	**12.4**	
Step pool cascade	**3**	**50.0**	2,892.9	**87.3**	
Slip face cascade					
Total Cascades	**5**	**83.3**	**3,305.0**	99.7	
Pocketwater					
Glide					
Run					
Low gradient riffle					
Total Riffles					
Dammed pool					
Eddy pool					
Plunge pool	1	**16.7**	**8.3**	**0.3**	
Scour pool					
Scour hole					
Beaver pond					
Total Pools	1	16.7	**8.3**	**0.3**	
Secondaw channel					
Grand Totals	**6**	100.0	3,313.8	100.0	

Appendix D.24 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 2 for West Fork Lake Creek during 1994.**

Habit Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	**4**	**22.2**	**517**	**3.6**	
Step pool cascade	**7**	38.9	**5,308**	**365**	
Slip face cascade					
Total Cascades	11	61.1	**5,825**	40.1	
Pocketwater					
Glide					
Run					
Low gradient riffle	**2**	**11.1**	**291**	**2**	
Total Riffles	**2**	11.1	291	**2**	
Dammed pool					
Eddy pool					
Plunge pool	**2**	**11.1**	**61**	**0.4**	**0.2**
Scour pool	**2**	**11.1**	**213**	**1.5**	
Scour hole	1	**5.6**	**8,138**	**56.1**	**1.5**
Beaver pond					
Total Pools	**5**	67.9	8,412	**58**	
Secondary channel					
Grand Totals	18		**14,528**		

Appendix D.25 Summary report for Reach # 1 of the Bozard Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,540 - 2,590 ft	NA
Total length	3,888.3 m	
Stream order	3	
Mean stream gradient	2.0	
Rifflelpoolratio	12 : 1	
Land use		
Forest	50.5	
Agriculture	49.5	
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential.right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	
Seral stage		
Grass/forb		
Shrub	92.3	
Pole		
Young	7.7	
Mature		
Old growth		
Other		
x Canopy cover	0.0	
#Woody debris		
Logs		
Root wads		

Appendix D.26 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 1 for Bozard Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	**5**	**38.5**	**9.672.5**	**37.5**	
Run					
Low gradient riffle	**7**	**53.9**	**16,062.4**	**62.3**	
Total Riflies	12	92.4	25,751.g	99.8	
Dammed pool					
Eddy pool					
Plunge pool	1	**7.7**	**22.0**	**0.2**	**0.5**
Scour pool					
Scour hole					
Beaver pond					
Total Pools	1	**7.7**	**22.0**	**0.2**	
Secondary channel					
Grand Totals	13	100.1	25,7576.9	100.0	

Appendix D.27 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #for Creek during 1994.**

Habit Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide					
Run			**NA**		
Low gradient riffle					
Total Riffles					
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool					
Scour hole					
Beaver pond					
Total Pools					
Secondary channel					
Grand Totals					

Appendix **D.28 Summary report for Reach # 1 of the Benewah Creek Watershed data collected during 1993 and 1994.**

Parameter	1993	1994
Elevation	2,250 - 2,250 ft.	same
Total length	1,547 ft.	1598 ft
Stream order	4	4
Mean stream gradient	1.7	1.0
Riffle/pool ratio	1.7 ; 1	2 ; 1
Land use		
Forest		
Agriculture		
Livestock grazing		
Mining		
Wetland	100 %	100%
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100%
Seral stage		
Grass/forb		
Shrub	100 %	100%
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	0 %	29.4 %
# Woody debris		
Logs	8	15
Root wads		1

Appendix D.29 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 1 for Benewah Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. feet)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater	1	2.9	7795.3	27.5	
Glide	5	14.3	3600.6	12.7	
Run					
Low gradient riffle	14	40.0	9494.8	33.5	
Total Riffles	20	57.2	**20891**	73.7	
Dammed pool					
Eddy pool					
Plunge pool	2	5.7	507.5	1.8	0.8
Scour pool	13	37.14	5824.4	20.6	1.0
Scour hole					
Beaver pond					
Total Pools	**15**	42.64	6332	22.4	
Secondary channel					
Grand Totals	35		27.223		

Appendix D.30. **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #1 for Benewah Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	3	9.1	732	21.8	
Step pool cascade					
Slip face cascade					
Total Cascades	3	**9.1**	732	21.8	
Pocketwater	3	9.1	933	27.7	
Glide	4	12.1	573	17.0	
Run					
Low gradient riffle	13	39.4	727	21.6	
Total Riffles	20	60.6	2,233	66.3	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	10	30.3	401	11.9	0.7
Scour hole					
Beaver pond					
Total Pools	10	30.3	**401**	**11.9**	
Secondary channel					
Grand Totals	33		3,366		

Appendix D.31 Summary report for Reach # 2 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,250 - 2,330 ft.	same
Total length	4,402 ft.	4645 ft
Stream order	4	4
Mean stream gradient	2.0	2.9
Riffle/pool ratio	4.3 ; 1	7 ; 1
Land use		
Forest	100 %	100 %
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100 %
Seral stage		
Grass/forb		
Shrub	100 %	100 %
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	80%	37%
# Woody debris		
Logs	5	6
Root wads		

Appendix D.32 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 2 for Benewah Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	6	27.3	6790.6	13.3	0.3
Slip face cascade					
Total Cascades	**6**	**27.3**	**6790.6**	**13.3**	**0.3**
Pocketwater	5	22.7	11815.3	23.1	
Glide					
Run					
Low gradient riffle	8	36.4	32077.2	62.8	
Total Riffles	**13**	**59.1**	**43892.5**	**85.9**	
Dammed pool					
Eddy pool					
Plunge pool	1	4.5	108.8	0.2	0.4
Scour pool	2	9.1	271.3	0.5	0.3
Scour hole					
Beaver pond					
Total Pools	3	13.6	**380.1**	0.7	
Secondary channel					
Grand Totals	**22**		**51.063**		

Appendix D.33 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #2 for Benewah Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	4	33.3	5591	27.5	
Step pool cascade					
Slip face cascade					
Total Cascades	**4**	33.3	5.59	27.5	
Pocketwater	5	41.7	10,538	51.8	
Glide					
Run					
Low gradient riffle	2	16.6	3721	18.3	
Total Riffles	**7**	58.3	**14,259**	**70.1**	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	1	8.3	507	2.5	0.4
Scour hole					
Beaver pond					
Total Pools	**1**			**2.5**	
Secondary channel					
Grand Totals	12		**507**		

Appendix D.34 Summary report for Reach # 3 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	**2,330 - 2,330 ft.**	**same**
Total length	**2,376 ft.**	**3,788 ft.**
Stream order	**4**	**4**
Mean stream gradient	**2.5**	**2.0**
Riffle/pool ratio	**1.3 ; 1**	**2.5 ; 1**
Land use		
Forest	100%	100%
Agticutture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb		
Shrub	100%	loo %
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	**28.5 %**	**40 %**
# Woody debris		
Logs	3	1
Root wads	0	0

Appendix D.35 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 3 for Benewah Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater	1	6.25	1408	4.8	
Glide	1	6.25	583	1.97	
Run					
Low gradient riffle	7	43.75	24311	82.29	
Total Riffles	9	58.25	26302	89.06	
Dammed pool					
Eddy pool	1	6.3	109.7	0.4	0.79
Plunge pool					
scour pool	6	37.5	3129	10.6	0.56
Scou hole					
Beave pond					
Total Pools	7	43.8	3239	**11.0**	
Sewn? ary channel					
Grand otals	**16**		**29,541**		

Appe dix D.36 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #3 for Benewah Cree during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	1	7.7	1746	7.7	
Slip face cascade					
Total Cascades	**1**	7.7	1,748	7.7	
Pocketwater	2	15.4	1597	7.1	
Glide					
Run					
Low gradient rime	6	46.2	18,429	81.6	
Total Riffles	8	**61.6**	20,026	88.7	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	4	44.2	814	3.6	0.4
Scour hole					
Beaver pond					
Total Pools	4	44.2	**814**	**3.6**	
Secondary channel					
Grand Totals	**13**			**22,856**	

Appendix D.37 Summary report for Reach # 4 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,330 - 2,360 ft.	same
Total length	4,425 ft.	5,670 ft.
Stream order	4	
Mean stream gradient	1.5	2.0
Riffle/pool ratio	1 ;1	1.8 ; 1
Land use		
Forest	100%	100%
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential, right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb		
Shrub	100%	100%
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	-ND-	17.7 %
# Woody debris		
Logs	3	3
Root wads	0	0

Appendix D.38 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # for Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide					
Run					
Low gradient riffle	6	50.0	30768.3	95.3	
Total Riffles	6	60.0	30768.3	95.3	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	6	50.0	1506.9	4.7	0.33
Scour hole					
Beaver pond					
Total Pools	6	60.0	1506.9	4.7	
Secondary channel					
Grand Totals	12	**100.0**	32275.2	100.0	

Appendix D.39 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 4 for Benewah Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	4	26.7	9845	22.3	
Slip face cascade					
Total Cascades	4	26.7	**9,845**	22.3	
Pocketwater	5	33.3	26,163	59.3	
Glide					
Run					
Low gradient riffle	2	13.3	6040	13.7	
Total Riffles	7	46.6	32,203	73.0	
Dammed pool					
Eddy pool	1	6.7	55	0.1	0.2
Plunge pool					
Scour pool	3	20.0	1,990	4.5	1.1
Scour hole					
Beaver pond					
Total Pools	4	26.7	**2,045**	4.6	
Secondary channel					
Grand Totals	15		44,093		

Appendix D.40 Summary report for Reach # 5 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,380 -2,490 ft.	same
Total length	3,467 ft.	4,081 ft.
Stream order	4	4
Mean stream gradient	3 %	2.0
Riffle/pool ratio	3 ; 1	1 ; 0
Land use		
Forest	100%	100%
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb		
Shrub	100 %	100%
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	-ND-	16.8 %
# Woody debris		
Logs		3
Root wads	0	0

Appendix D.41 **Frequency of occurrence, total percent occurence, total area, perce area, residual pool depth and volume values for Reach # ა for Benewah Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	3	27.3	2114	6.8	0.3
Slip face cascade					
Total Cascades	3	27.3	**2114**	6.8	0.3
Pocketwater					
Glide					
Run					
Low gradient riffle	6	54.6	28,530	92.2	
Total Riffles	6	64.6	28630	92.2	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	2	18.2	312	1.0	0.21
Scour hole					
Beaver pond					
Total Pools	2	18.2	312	**1.0**	
Secondary channel					
Grand Totals	**11**		**30,956**		

Appendix D.42 **Frequency of occurrence, totaı percent occurenc total area, percent area, residual pool depth and volume values for Reach # 5 for Benewah Creek during 1994.**

Habitat Type	Frequency	% Freqconcy	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	7	45.8	5.134	17.6	
Slip face cascade					
Total Cascades	7	43.8	5,134	17.6	
Pocketwater	1	6.3	358	1	
Glide					
Run					
Low gradient rime	8	50	23,664	81.2	
Total Riffles	9	66.3	24,022	82.4	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool					
Scour hole					
Beaver pond					
Total Pools					
Secondary channel					
Grand Totals	I 6		**29,156**		

Appendix D.43 Summary report for Reach # 6 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,490 - 2,550 ft.	same
Total length	2,741 ft.	2,618 ft
Stream order	4	4
Mean stream gradient	1.0 %	1.5 %
Riffle/pool ratio	1.5 ; 1	3 ; 1
Land use		
Forest		
Agriculture		
Livestock grazing	100 %	100%
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100 %
Seral stage		
Grass/forb		
Shrub	100 %	100%
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	-NA-	3 %
# Woody debris		
Logs		0
Root wads	0	0

Appendix D.44 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 6 for Benewah Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocket-water					
Glide					
Run					
Low gradient rime	3	60.0	6,651	95.1	
Total Riffles	3	60.0	**6,651**	**95.1**	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	2	40.0	345	49	0.23
Scour hole					
Beaver pond					
Total Pools	2	40.0	**345**	**49**	
Secondary channel					
Grand Totals	5		6,995		

Appendix D.45 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 6 for Benewah Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	1	20	2,019	15.9	
Slip face cascade					
Total Cascades	**1**	20	**2,019**	**15.9**	
Pocketwater					
Glide	1	20	2,347	18.5	
Run					
Low gradient riffle	2	40	8,032	63.3	
Total Riffles	**3**	50	**10,379**	**81.8**	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	1	20	296	23	0.6
Scour hole					
Beaver pond					
Total Pools	I	20	296	23	
Secondary channel					
Grand Totals	6		**12,694**		

Appendix D.46 Summary report for Reach # 7 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,550 - 2,660	same
Total length	10,477 ft.	12,090 ft
Stream order	4	4
Mean stream gradient	1.4 %	1.2 %
Riffle/pool ratio	1.2 ; 1	3.1 ; 1
Land use		
Forest		
Agriculture		
Livestock grazing	100 %	100%
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb		
Shrub	100%	100 %
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	48.7 %	43 %
# Woody debris		
Logs	1	10
Root wads	0	9

Appendix D.47 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 7 for Benewah Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	9	12.3	10,212	19.1	
Run					
Low gradient riffle	31	42.5	38.191	71.3	
Total Riffles	40	54.8	48,403	90.4	
Dammed pool	1	1.4	1,262	2.3	0.9
Eddy pool					
Plunge pool					
Scour pool	32	43.8	3891	7.3	0.6
Scour hole					
Beaver pond					
Total Pools	33	45.2	**5,153**	**9.6**	
Secondary channel					
Grand Totals	73		53,557		

Appendix D.48 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #7 for Benewah Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	2	2.6	917	1.7	
Slip face cascade					
Total Cascades	2	2.6	**917**	**1.7**	
Pocketwater					
Glide	23	29.9	19,339	35.7	
Run					
Low gradient rime	34	44.2	25,112	46.4	
Total Riffles	57	74.1	**44,451**	**82.1**	
Dammed pool	1	1.3	5.121	9.5	0.5
Eddy pool	1	1.3	292	0.5	1.4
Plunge pool					
Scour pool	16	20.8	3,396	6.3	0.6
Scour hole					
Beaver pond					
Total Pools	**18**	23.4	8,809	16.3	
Secondary channel					
Grand Totals	**77**		**54,177**		

Appendix D.48 Summary report for Reach # 8 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,560 -2,640 ft.	same
Total length	9,035 ft.	9,174 ft.
Stream order	4	
Mean stream gradient	1.8 %	1.8 %
Riffle/pool ratio	1.3 ; 1	
Land use		
Forest		
Agriculture		
Livestock grazing	100%	100%
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	loo %	100 %
Seral stage		
Grass/forb		
Shrub	100%	100%
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	21.4 %	26.1 %
# Woody debris		
Logs	.21	6
Root wads	2	0

Appendix D.49 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 8 for Benewah Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	17	19.8	13,162	35.8	
Run					
Low gradient rime	33	38.4	9,717	26.4	
Total Riffles	**50**	58.2	2,288	62	
Dammed pool	1	1.2	21,800	5.9	1.13
Eddy pool					
Plunge pool					
Scour pool	35	40.7	11,705	31.8	0.77
Scour hole					
Beaver pond					
Total Pools	**36**	**41.9**	33,505	37.7	
Secondary channel					
Grand Totals	86		35,793		

Appendix D.50 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #8 for Benewah Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	16	19.0	12,482	39	
Run					
Low gradient riffle	40	47.6	9.646	30.1	
Total Riffles	**56**	66.6	**22,128**	**69.1**	
Dammed pool	1	1.2	1,668	5.2	0.8
Eddy pool					
Plunge pool					
Scour pool	27	32.1	8.212	25.7	0.7
Scour hole					
Beaver pond					
Total Pools	28	33.3	9,880	30.9	
Secondary channel					
Grand Totals	**84**		32,007		

Appendix D.51 Summary report for Reach # 9 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,640 - 2,640 ft.	same
Total length	3,386 ft.	12,850 ft
Stream order	4	0
Mean stream gradient	1.75 %	1.3 %
Riffle/pool ratio	1.7 ; 1	2.8 ; 1
Land use		
Forest		
Agriculture		
Livestock grazing	100 %	100 %
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100 %
Seral stage		
Grass/forb		
Shrub	100%	100 %
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	45 %	10.5 %
# Woody debris		
Logs	29	71
Root wads		3

Appendix D.52 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 9 for Benewah Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	11	31.4	6,317	23.3	
Run					
Low gradient riffle	11	31.4	26,650	9.8	
Total Riffles	22	62.8	8,982	33.0	
Dammed pool	3	8.6	14,715	54.0	0.83
Eddy pool					
Plunge pool					
Scour pool	10	28.6	3,535.4	12.9	0.88
Scour hole					
Beaver pond					
Total Pools	**13**	37.2	**18,250**	66.9	
Secondary channel					
Grand Totals	35		27,232		

Appendix D.53 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #9 for Benewah Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade	2	3.3	390	0.7	
Total Cascades	2	3.3	390	0.7	
Pocketwater					
Glide	17	28.3	13,149	21.9	
Run					
Low gradient riffle	26	43.3	9346	15.6	
Total Riffles	43	71.6	22,495	37.5	
Dammed pool	4	6.7	35170	58.6	1.0
Eddy pool					
Plunge pool	2	3.3	433	0.7	0.7
Scour pool	9	15.0	1528	2.5	0.7
Scour hole					
Beaver pond					
Total Pools	**15**	25	37,131	61.8	
Secondary channel					
Grand Totals	**60**		**60,016**		

Appendix D.54 Summary report for Reach # 10 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,640 - 2,750 ft.	same
Total length	9,339 ft.	2,275 ft
Stream order	4	4
Mean stream gradient	1.75 %	1.2 %
Riffle/pool ratio	3.5 ; 1	3.5 ; 1
Land use		
Forest		
Agriculture		
Livestock grazing	100%	100%
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb		
Shrub	100%	100%
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover		
# Woody debris		
Logs	24.2	NA
Root wads	0	

Appendix D.55 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 10 for Benewah Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Packetwater					
Glide	22	34.9	13,253	3.4	
Run					
Low gradient riffle	27	42.8	8,144	20.6	
Total Riffles	49	77.7	21,397	64.0	
Dammed pool	2	3.2	16.070	40.5	1.22
Eddy pool					
Plunge pool	1	1.6	57	0.1	0.76
Scour pool	11	17.5	2.113	3.3	0.73
Scour hole					
Beaver pond					
Total Pools	14	22.3	18,240	44	
Secondary channel					
Grand Totals	63		39,637		

Appendix D.56 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #10 for Benewah Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	4	44.4	2337	41.1	
Run					
Low gradient riffle	3	33.3	3171	55.7	
Total Riffles	7	77.7	5,508	96.8	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	2	22.2	18.1	3.2	0.5
Scour hole					
Beaver pond					
Total Pools	2	22.2	18.1	3.2	
Secondary channel					
Grand Totals	9		5,689		

Appendix D.57 Summary report for Reach # 11 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,750 - 2,760 ft.	same
Total length	1,935 ft.	3758 ft
Stream order	4	
Mean stream gradient		1.2 %
Riffle/pool ratio	2.4 ; 1	2.3 ; 1
Land use		
Forest		
Agriculture		
Livestock grazing	100 %	100%
Mining		
Wetland		
Floodplain		
Other (includes residential, right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100%
Seral stage		
Grass/forb		
Shrub	100%	100%
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	21.4 %	35 %
# Woody debris		
Logs	25	32
Rwt wads		

Appendix D.58 Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth volume values for Reach # 11 for Benewah Creek during 1993.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	7	22.6	1,824	29.3	
Run					
Low gradient riffle	15	48.4	2,677	42.9	
Total Riffles	**22**	**71.0**	**4,501**	72.2	
Dammed pool					
Eddy pool					
Plunge pool	1	3.2	429	6.9	1.1[illegible]
Scour pool	8	25.8	1.302	20.89	0.4.
Scour hole					
Beaver pond					
Total Pools	9	29.0	**1,731**	**27.79**	
Secondary channel					
Grand Totals	**31**		6,232		

Appendix D.59 Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #11 for Benewah Creek during 1994.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	2	20	587	13.2	
Run					
Low gradient riffle	5	50	3,447	77.7	
Total Riffles	7	70	4,034	90.9	
Dammed pool					
Eddy pool					
Plunge pool	1	10	55	1.2	0.4
Scour pool	2	20	350	7.9	0.4
Scour hole					
Beaver pond					
Total Pools	3	30	495	**9.1**	
Secondary channel					
Grand Totals	**10**		**4,439**		

Appendix D.60 Summary report for Reach # 12 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,760 -2,940 ft.	same
Total length	4,127 ft.	4,633 ft
Stream order	4	4
Mean stream gradient	2.3 %	1.3 %
Riffle/pool ratio	1.3 ; 1	2 :1
Land use		
Forest	100%	100 %
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb		
Shrub	100%	100%
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	51.6 %	44 %
# Woody debris		
Logs	335	186
Root wads		

Appendix D.61 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 12 for Benewah Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	2	9.5	525	5.2	
Run					
Low gradient riffle	10	47.6	8530	83.65	
Total Riffles	**12**	**57.1**	**9055**	88.85	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	9	42.9	1,142	11.2	0.4
Scour hole					
Beaver pond					
Total Pools	**9**	**42.9**	**1,142**	**11.2**	
Secondary channel					
Grand Totals	**21**		**10,197**		

Appendix D.62 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #12 for Benewah Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	3	20	418	3.4	
Run					
Low gradient riffle	7	46.7	11,204	90.4	
Total Riffles	**10**	66.7	**11,622**	**93.8**	
Dammed pool	2	13.3	205	1.7	0.4
Eddy pool					
Plunge pool	1	6.7	20.1	0.2	0.2
Scour pool	2	13.3	547	4.4	0.7
Scour hole					
Beaver pond					
Total Pools	5	33.3	**772.1**	6.3	
Secondary channel					
Grand Totals	**15**		**12,394**		0.4

Appendix D.63 Summary report for Reach # 13 of the Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,940 - 3,060 ft.	same
Total length	4,948 ft.	2498 ft
Stream order	2	2
Mean stream gradient	6.0 %	3.8 %
Riffle/pool ratio	1 : 1.2	2 : 1
Land use		
Forest	100%	100%
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential, right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb		
Shrub	100%	100%
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	75.3 %	84 %
# Woody debris		
Logs	48.8	131
Root wads	0	

Appendix D.64 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 13 for Benewah Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	6	17.65	3.153	22.87	
Step pool cascade	4	11.76	885	6.42	0.3
Slip face cascade					
Total Cascades	**10**	**29.41**	4,038	29.29	
Pccketwater					
Glide	1	2.94	293	2.1	
Run					
Low gradient riffle	10	29.4	4,321	31.35	
Total Riffles	**11**	32.34	4,614	33.45	
Dammed pool	3	8.8	4666	33.85	0.6
Eddy pool					
Plunge pcol	5	14.7	152	1.1	0.3
Scour pool					
Scour hole	5	14.7	314	2.28	0.3
Beaver pond					
Total Pools	**13**	38.20	5,132	37.23	
Secondary channel					
Grand **Totals**	**34**		13,784		

Appendix D.65 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #13 for Benewah Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step po. de	4	40	1,946	28.3	
Slip face .e					
Total Ca es	4	40	**1,946**	28.3	
Pocketwater	1	IO	245	3.6	
Glide	1	10	138	2.0	
Run					
Low gradient riffle	2	20	1,042	15.2	
Total Riffles	4	40	**1,423**	20.8	
Dammed po	1	10	3,414	49.7	1.1
Eddy pool					
Plunge pool	1	10	91	1.3	0.4
Scour pool					
Scour hole					
Beaver pond					
Total Pools	2	20	**3,5**	**51.0**	
Secondary channel					
Grand Totals	**10**		6,873		0.7

Appendix D.66 Summary report for Reach # 1 of the S.E. Benewah Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	**2,847 - 3,061 ft.**	**same**
Total length	**10,807 ft.**	**11,463 ft.**
Stream order	**3**	**3**
Mean stream gradient	**7.5 %**	**7.5 %**
Riffle/pool ratio	**1.1 : 1**	**2.7 : 1**
Land use		
Forest	50 %	50 %
Agriculture		
Livestock grazing	50 %	50 %
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100%
Seral stage		
Grass/forb		
Shrub	50 %	50 %
Pole		
Young		
Mature	50 %	50 %
Old growth		
Other		
x Canopy cover	**51.7 %**	**76 %**
# Woody debris		
Logs	392	103
Root wads	6	

Appendix D.67 Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 1 for S. E. Benewah Creek during 1993.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	9	23.6	26.086	47.6	
Step pool cascade	14	36.8	13,892	25.4	0.19
Slip face cascade					
Total Cascades	23	60.4	39,978	73.0	
Pocketwater					
Glide					
Run					
Low gradient riffle	8	21.1	12,268	22.4	
Total Riffles	8	21.1	**12,268**	22.4	
Dammed pool					
Eddy pool					
Plunge pool	4	10.5	1.008	1.8	0.28
Scour pool	3	7.9	1,541	2.8	0.24
Scour hole					
Beaver pond					
Total Pools	7	18.5	**2,549**	4.6	
Secondary channel					
Grand Totals	**38**		**54,795.3**		

Appendix D.68 Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #1 for S. E. Benewah Creek during 1994.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	2	4.3	2,831	11.5	
Step pool cascade	15	32.6	11,568	47	
Slip face cascade					
Total Cascades	17	36.9	14,399	58.5	
Pocketwater	2	4.2	296	1.2	
Glide	1	2.1	47	0.2	
Run					
Low gradient riffle	19	40.4	9,515	38.7	
Total Riffles	22	46.7	9,862	40.1	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	8	17.4	348	1.4	0.2
Scour hole					
Beaver pond					
Total Pools	8	**17.4**	**348**	**1.4**	0.2
Secondary channel					
Grand Totals	46		24,804		

Appendix D.69 Summary report for Reach # 1 of the Evans Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,130 - 2,130 ft.	same
Total length	2,886 ft.	5,194 ft
Stream order	3	3
Mean stream gradient	1.0 %	1.3 %
Riffle/pool ratio	1 : 1.5	1 : 1
Land use		
Forest		
Agriculture		
Livestock grazing	100%	100%
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious	100%	loo %
Coniferous		
Mixed		
Seral stage		
Grass/forb		
Shrub	100%	100 %
Pole		
Young		
Mature	59.5 %	59.5 %
Old growth		
Other		
x Canopy cover	28.3 %	6.0%
# Woody debris		
Logs	0	5
Root wads	0	0

Appendix D.70 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 1 for Evans Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	2	7.1	1,523	4.2	
Run					
Low gradient riffle	11	39.3	23.951	66.6	
Total Riffles	**13**	**46.4**	**25,474**	**70.8**	
Dammed pool					
Eddy pool	5	17.9	1,553	4.3	0.5
Plunge pool					
Scour pool	10	35.7	8,930	24.8	0.4
Scour hole					
Beaver pond					
Total Pools	**15**	**53.6**	**10,483**	**29.1**	
Secondary channel					
Grand Totals	**28**		**35,957**		

Appendix D.71 **Frequency of occurren total percent occurence, total** area, percent area, residual **pool depth and volume values** **fo Reach #1 for Evans Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	1	25	8323	87.1	
Run					
Low gradient riffle	1	25	858	9.0	
Total Riffles	**2**	**50**	**9,181**	**96.1**	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	2	50	357	3.9	0.5
Scour hole					
Beaver pond					
Total Pools	**2**	**50**	**357**	**3.9**	
Secondary channel					
Grand Totals	**4**		**9,556**		

Appendix D.72 Summary report for Reach # 2 of the Evans Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,130 - 2,130	same
Total length	5,189 ft.	3,166 ft
Stream order	3	3
Mean stream gradient	1.5 %	1.3 %
Riffle/pool ratio		1.2 : 1
Land use		
Forest	60.3 %	60.3 %
Agriculture		
Livestock grazing	39.7 %	39.7 %
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious	60 %	60 %
Coniferous		
Mixed	40 %	40 %
Seral stage		
Grass/forb		
Shrub	40.5 %	40.5 %
Pole		
Young		
Mature	59.5 %	59.5 %
Old growth		
Other		
x Canopy cover	51.8 %	34.1 %
# Woody debris		
Logs	59	18
Root wads	17	8

Appendix D.73 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 2 for Evans Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	3	4.1	359		
Step pool cascade					
Slip face cascade	4	5.5	1.589		
Total Cascades	7	9.6	**1,947**	2.6	
Pocketwater					
Glide					
Run					
Low gradient riffle	34	46.6	84,956		
Total Riffles	**34**	46.6	64,956	86.5	
Dammed pool	3	4.1	701		0.3
Eddy pool					
Plunge pool	2	2.7	201		0.2
Scour pool	22	30.1	6,425		0.1
Scour hole	5	6.8	834		0.3
Beaver pond					
Total Pools	32	43.7	8,188	**10.9**	
Secondary channel					
Grand Totals	73		75,090		

Appendix D.74 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #2 for Evans Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	5	7	1,900	7.6	
Run					
Low gradient riffle	34	47.9	18,531	74.1	
Total Riffles	**39**	**52.9**	**20,431**	81.7	
Dammed pool					
Eddy pool					
Plunge pool	1	1.4	549	2.2	0.7
Scour pool	24	33.8	2,949	11.8	0.5
Scour hole	7	9.9	1,077	4.3	0.6
Beaver pond					
Total Pools	32	45.1	4,575	18.3	
Secondary channel					
Grand Totals	**71**		25,006		

Appendix D.75 Summary report for Reach # 3 of the Evans Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,130 - 2,270 ft.	same
Total length	5,652 ft.	3,041 n
Stream order	3	3
Mean stream gradient	2.0 %	1.9 %
Riffle/pool ratio	1 : 1.6	1.2 : 1
Land use		
Forest	100 %	100%
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential-right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb		
Shrub		
Pole		
Young		
Mature	100 %	100%
Old growth		
Other		
x Canopy cover	65.2 %	10.5 %
# Woody debris		
Logs	49	71
Root wads	7	19

Appendix D.76 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 3 for Evans Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	20	17.5	4,643	21.6	
Step pool cascade	1	0.9	25	0.1	
Slip face cascade	1	0.9	43	0.2	
Total Cascades	**22**	**19.3**	**4,711**	**21.9**	
Pocketwater					
Glide					
Run					
Low gradient riffle	35	30.7	11,946	55.6	
Total Riffles	35	30.7	**11,946**	55.6	
Dammed pool	4	3.5	605	2.8	1.4
Eddy pool	2	1.8	19	0.08	[illegible]1
Plunge pool	13	11.4	804	3.7	[illegible]
Scour pool	36	31.6	3,299	15.4	
Scour hole	2	1.8	88	0.4	1.2
Beaver pond					
Total Pools	57	50.1	4,815	22.4	
Secondary channel					
Grand Totals	**114**		**21,471**		

Appendix D.77 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #3 for Evans Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	3	6.8	[illegible]065	7.4	
Slip face cascade	1	2.3	[illegible].2	0.6	
Total Cascades	4	**9.1**	**1,155**	8.0	
Pocketwater					
Glide	1	2.3	176	1.2	
Run					
Low gradient riffle	21	47.7	9,942	68.7	
Total Riffles	22	60.0	**10,118**	69.9	
Dammed pool					
Eddy pool					
Plunge pool	2	4.5	270	1.9	0.6
Scour pool	9	20.4	2,061	14.2	0.5
Scour hole	7	15.9	867	6.0	0.5
Beaver pond					
Total Pools	**18**	48.8	**3,198**	**22.1**	
Secondary channel					
Grand Totals	**44**		**14,471**		

Appendix D.78 Summary report for Reach # 4 of the Evans Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,270 - 2,580 ft.	same
Total length	5,906 ft.	5,966
Stream order	3	3
Mean stream gradient	3.0 %	2.3 %
Riffle/pool ratio	1.3 : 1	1.9 : 1
Land use		
Forest	100%	100%
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb		
Shrub		
Pole		
Young		
Mature	100%	100%
Old growth		
Other		
x Canopy cover	69.4 %	47.7 %
# Woody debris		
Logs	16	168
Root wads	5	18

Appendix D.79 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 4 for Evans Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	34	45.9	21,698	84.9	
Step pool cascade	8	10.8	1,651	6.6	
Slip face cascade					
Total Cascades	42	55.2	23,348	**91.5**	
Pocketwater					
Glide					
Run					
Low gradient riffle	1	1.4	203.4	0.8	
Total Riffles	**1**	**1.4**	203.4	0.8	
Dammed pool	1	1.4	27.8	0.1	
Eddy pool	2	2.8	51.6	0.2	
Plunge pool	11	14.9	726	2.8	
Scour pool	17	22.9	1,192	4.7	
Scour hole					
Beaver pond					
Total Pools	32	41.9	1,997	7.8	
Secondary channel					
Grand Totals	75	99.5	25,541	**100.1**	

Appendix D.80 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #4 for Evans Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	4	4.4	1,771	5.8	
Step pool cascade	18	20	12,733	41.7	
Slip face cascade					
Total Cascades	**22**	24.4	**14,504**	47.5	
Pocketwater					
Glide					
Run					
Low gradient riffle	36	40	12.574	41.2	
Total Riffles	36	40	12,574	41.2	
Dammed pool					
Eddy pool					
Plunge pool	12	13.3	1,038	3.4	0.3
Scour pool	18	20	2.182	7.2	0.3
Scour hole	1	1.1	98.8	0.3	0.4
Beaver pond					
Total Pools	**31**	34.4	**3,319**	**10.9**	
Secondary channel	1	1.1	109.7	0.4	
Grand Totals	**90**		30,505		

Appendix D.81 Summary report for Reach # 5 of the Evans Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	**2,580 - 3,340 ft.**	**same**
Total length	**3,247 ft.**	**2,412 ft**
Stream order	**2**	**2**
Mean stream gradient	**10.8 %**	**3.1 %**
Riffle/pool ratio	**3.8 : 1**	**4.1 : 1**
Land use		
Forest	100%	100%
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100%
Seral stage		
Grass/forb		
Shrub		
Pole		
Young		
Mature	100 %	100%
Old growth		
Other		
x Canopy cover	**37.5 %**	**59.7%**
# Woody debris		
Logs	90	191
Root wads		9

Appendix D.82 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 5 for Evans Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	5	26.3	2,688	25.1	
Step pool cascade	7	36.8	4,095	38.3	
Slip face cascade					
Total Cascades	**12**	**63.1**	**6,783**	**63.4**	
Pocketwater					
Glide					
Run					
Low gradient rime	3	15.8	755	7.1	
Total Riffles	**3**	**15.8**	**755**	**7.1**	
Dammed pool					
Eddy pool					
Plunge pool	4	21.1	316	29.5	0.5
Scour pool					
Scour hole					
Beaver pond					
Total Pools	**4**	**21.1**	**316**	**29.5**	
Secondary channel					
Grand Totals	**19**	**100**	**10,696**	**100**	

Appendix D.83 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 5 for Evans Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	12	38.7	4,069	22.9	
Step pool cascade	I2	38.7	12,937	72.8	
Slip face cascade					
Total Cascades	**24**	**77.4**	**17,006**	**95.7**	
Pocketwater					
Glide					
Run					
Low gradient riffle	I	3.2	185	1.0	
Total Riffles	**1**	**3.2**	**185**	**1.0**	
Dammed pool					
Eddy pool					
Plunge pool	3	9 7	333	1.9	0.5
Scour pool	3	9	254	I .4	0.5
Scour hole					
Beaver pond					
Total Pools	**6**	**19.4**	**587**	**3.3**	
Secondary channel					
Grand Totals	**31**		**17,779**		

Appendix D.84 Summary report for Reach # 6 of the Evans Creek (right fork) Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,680 - 3,040 ft.	same
Total length	2,278 ft.	2,183 ft
Stream order	2	2
Mean stream gradient	12.5 %	8.1 %
Riffle/pool ratio	NA	5 : 1
Land use		
Forest	100%	100%
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100%
Seral stage		
Grass/forb		
Shrub		
Pole		
Young		
Mature	100 %	100%
Old growth		
Other		
x Canopy cover	70.0 %	66 %
# Woody debris		
Logs	86	51
Root wads		3

Appendix D.85 Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 6 for Evans Creek (right fork) during 1993.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	5	50	728	25.8	
Step pool cascade	5	50	2,099	74.2	
Slip face cascade					
Total Cascades	**10**	**100**	2,827	**100**	
Pocketwater					
Glide					
Run					
Low gradient riffle					
Total Riffles					
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool					
Scour hole					
Beaver pond					
Total Pools					
Secondary channel					
Grand Totals	**10**	**100**	2,827	**100**	

Appendix D.86 Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 6 for Evans Creek during 1994.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	5	38.5	2,363	44.6	
Step pool cascade	6	46.2	2,695	50.8	
Slip face cascade					
Total Cascades	**11**	04.7	5,058	95.4	
Pocketwater					
Glide					
Run					
Low gradient riffle	I	7.7	191	3.4	
Total Riffles	**1**	7.7	**191**	3.4	
Dammed pool					
Eddy pool					
Plunge pool	1	7.7	55	1.0	0.2
Scour pool					
Scour hole					
Beaver pond					
Total Pools	**1**	7.7	55	**1.0**	
Secondary channel					
Grand Totals	**13**		**7,960**		

Appendix D.87 Summary report for Reach # 1 of the Evans Creek (left fork) Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,580 - 3,170 ft.	same
Total length	3,205 ft.	3,331 ft.
Stream order	2	2
Mean stream gradient	10.7 %	10.8 %
Riffle/pool ratio	3 : 1	5 : 1
Land use		
Forest	91.2 %	91.2 %
Agriculture		
Livestock grazing	8..8 %	8.8 %
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb		
Shrub		
Pole		
Young		
Mature	100 %	100 %
Old growth		
Other		
x Canopy cover	34.0 %	39 %
# Woody debris		
Logs	50	31
Root wads		4

Appendix D.88 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 1 for Evans Creek (left fork) during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	3	17.6	863	14.4	
Step pool cascade	6	35.3	2,184	36.4	
Slip face cascade					
Total Cascades	**9**	**52.9**	**3,047**	**50.8**	
Pocketwat					
Glide					
Run					
Low gradient riffle	6	35.3	1,781	29.7	
Total Riffles	**6**	**35.3**	**1,781**	**29.7**	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	2	11.8	1,169	19.5	0.3
Scour hole					
Beaver pond					
Total Pools	**2**	**11.8**	**1,169**	**19.5**	
Secondary channel					
Grand Totals	**17**	**100**	**5,996**	**100**	

Appendix D.89 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #5a for Evans Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	5	27.8	1,462	22.4	
Step pool cascade	7	38.9	3,356	51.4	
Slip face cascade					
Total Cascades	**12**	**66.7**	**4,818**	**73.8**	
Pocketwater					
Glide					
Run					
Low gradient riffle	5	27.8	1,665	25.5	
Total Riffles	**5**	**27.8**	**1,665**	**25.5**	
Dammed pool					
Eddy pool					
Plunge pool	1	5.6	43	0.7	0.2
Scour pool					
Scour hole					
Beaver pond					
Total Pools	**1**	**5.6**	**43**	**0.7**	
Secondary channel					
Grand Totals	**18**		**6,526**		

Appendix D.90 Summary report for Reach # 1 of the Alder Creek Watershed, data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,260 - 2,366 ft	same
Total length	2,892 ft	2,874 ft
Stream order	4	4
Mean stream gradient	1.5 %	5 %
Riffle/pool ratio	1.4 : 1	1 : 1
Land use		
Forest	100 %	same
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100%
Seral stage		
Grass/forb	7.1 %	7.1 %
Shrub	35.7 %	35.7 %
Pole	37.5 %	37.5 %
Young	12.5 %	12.5 %
Mature	7.1 %	7.1 %
Old growth		
Other		
x Canopy cover	32 %	22 %
# Woody debris		
Logs	I 4	28
Root wads	0	0

Appendix D.91 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 1 for Alder Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	I	3.6	110		
Slip face cascade					
Total Cascades	1	3.6	**110**		
Pocketwater	4	14.3	10,269		
Glide					
Run					
Low gradient riffle	11	39.3	15,380		
Total Riffles	**15**	53.6	25,649		
Dammed pool	I	3.6	274		0.9
Eddy pool					
Plunge pool	4	14.3	945		0.4
Scour pool	6	21.4	1.047		0.4
Scour hole					
Beaver pond					
Total Pools	**1**	**39.3**	2,266		
Secondary channel	I	3.6	217		
Grand Totals	28	**100.1**	28,242		

Appendix D.92 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #1 for Alder Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	2	14.3	1,064	5.8	
Slip face cascade					
Total Cascades	2	**14.3**	**1,064**	5.8	
Pocketwater	4	28.6	14.073	76.4	
Glide					
Run					
Low gradient riffle	2	14.3	1,606	8.7	
Total Riffles	6	42.9	**15,679**	**85.1**	
Dammed pool					
Eddy pool					
Plunge pool	2	14.3	750	4.1	0.8
Scour pool	3	21.4	650	3.5	0.4
Scour hole					
Beaver pond	I	7.1	268	1.5	0.8
Total Pools	6	42.8	**1,668**	**9.1**	
Secondary channel					
Grand Totals	**14**		**18,411**		

Appendix D.93 Summary report for Reach # 2 of the Alder Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	**2,350 - 2,630 ft**	**same**
Total length	**13,739 ft**	**13,803 ft**
Stream order	**4**	**4**
Mean stream gradient	**1.5 %**	**4.5 %**
Riffle/pool ratio	**1.2 : 1**	**4 : 1**
Land use		
Forest	50 %	50 %
Agriculture		
Livestock grazing	50 %	50 %
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Deciiious		
Coniferous		
Mixed	100 %	100 %
Seral stage		
Grass/forb	25.8 %	25.8 %
Shrub	9.7 %	9.7 %
Pole		
Young	6.4 %	6.4 %
Mature	56.5 %	56.5 %
Old growth	1.6 %	l.6 %
Other		
x Canopy cover	**30 %**	**34 %**
# Woody debris		
Logs	70	49
Root wads	0	I

Appendix D.94 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 2 for Alder Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	5	8.8	10,884	35.8	
Slip face cascade					
Total Cascades	**5**	**8.8**	**10,884**	**35.8**	
Pocketwater	2	3.5	1,315	4.3	
Glide	I	I.7	373	I.2	
Run					
Low gradient riffle	25	43.9	10,452	34.4	
Total Riffles	**28**	**49.1**	**12,141**	**39.9**	
Dammed pool	2	3.5	274	0.9	0.5
Eddy pool					
Plunge pool	12	21.1	4,819	15.9	0.8
Scour pool	9	15.9	2,098	6.9	0.5
Scour hole	1	I.7	146	0.5	0.7
Beaver pond					
Total Pools	24	**42.1**	**7,337**	**24.2**	
Secondary channel					
Grand Totals	57		**30,361**		

Appendix D.95 **·requency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #2 for Alder Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	I7	40.5	34.185	355	
Slip face cascade					
Total Cascades	**17**	40.5	**34,185**	**35.5**	
Pocketwater	17	40.5	59,363	61.7	
Glide	2	48	7,476	0.8	
Run					
Low gradient riffle	I	2.4	16€	0.2	
Total Riffles	**20**	90.9	**67,005**	62.7	
Dammed pool					
Eddy pool					
Plunge pool	4	9.5	1,540	I.6	1.3
Scour pool	1	2.4	260	0.3	0.2
Scour hole					
Beaver pond					
Total Pools	**5**	**11.9**	**1,800**	**1.9**	
Secondary channel					
Grand Totals	**42**		**96,260**		

Appendix D.96 Summary report for Reach # 3 of the Alder Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,630 - 2,700 ft	same
Total length	8,172 ft	8,003 ft
Stream order	4	4
Mean stream gradient	1.6 %	2.5 %
Riffle/pool ratio	1.3 : 1	4.4 ; 1
Land use		
Forest		
Agriculture		
Livestock grazing	100 %	100%
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb	24.7 %	24.7 %
Shrub	62.4 %	62.4 %
Pole		
Young		
Mature	12.9 %	12.9 %
Old growth		
Other		
x Canopy cover	32 %	32 %
# Woody debris		
Logs	I3	I5
Root wads	I	0

Appendix D.97 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 3 for Alder Creek during 1993.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	3	6.4	1,454	3.4	
Slip face cascade					
Total Cascades	3	6.4	**1,454**	3.4	
Pocketwater					
Glide	I	2.1	376	0.9	
Run					
Low gradient riffle	24	51.1	36,032	84.9	
Total Riffles	25	53.2	**36,401**	85.8	
Dammed pool					
Eddy pool					
Plunge pool	5	IO.6	I.368	3.2	I.2
Scour pool	I4	29.8	3,200	7.5	1.2
Scour hole					
Beaver pond					
Total Pools	**19**	48.4	4,588	10.7	
Secondary channel					
Grand Totals	47		42,423		

Appendix D.98 **Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach #3 for Alder Creek during 1994.**

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	3	IO	1,293	2.4	
Slip face cascade					
Total Cascades	3	**10**	**1,293**	24	
Pocketwater	3	10.0	16,185	29.4	
Glide	5	16.7	3,039	5.5	
Run					
Low gradient riffle	I4	46.7	33,567	61.0	
Total Riffles	22	73.4	**52,791**	95.9	
Dammed pool					
Eddy pool					
Plunge pool	1	3.3	307	0.6	0.3
Scour pool	4	13.3	605	1.1	0.2
Scour hole					
Beaver pond					
Total Pools	5	**16.6**	**912**	1.7	
Secondary channel					
Grand Totals	30		55,005		

Appendix D.99 Summary report for Reach # 4 of the Alder Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,700 - 2,900 ft	same
Total length	16,579 ft	19,049 ft
Stream order	4	4
Mean stream gradient	1.8 %	2.6 %
Riffle/pool ratio	1.2 : 1	2.6 : 1
Land use		
Forest		
Agriculture		
Livestock grazing	100%	100%
Mining		
Wetland		
Floodplain		
Other (includes residential.right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb	5.9 %	5.9 %
Shrub	26.7 %	26.7 %
Pole		
Young		
Mature	67.3 %	63.7 %
Old growth		
Other		
x Canopy cover	6.2 %	46.6 %
# Woody debris		
Logs	71	IO6
Root wads	6	IO

Appendix D.100 Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 4 for Alder Creek during 1993.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	1	1.0	1,723	1.8	
Slip face cascade					
Total Cascades	**1**	**1.0**	**1,723**	**1.8**	
Pocketwater					
Glide	2	2.0	1,033	1.1	
Run					
Low gradient rime					
Total Riffles	**52**	**54**	**76,823**	**79.4**	
Dammed pool	2	2.0	4,750	4.9	
Eddy pool					
Plunge pool	5	5.0	1,292	1.3	0.4
Scour pool	37	37.0	12,150	12.5	0.4
Scour hole	1	1	107	0.1	0.7
Beaver pond					
Total Pools	**45**	**45**	**18,299**	**18.8**	
Secondary channel					
Grand Totals	**100**	**100**	**96,846**	**100**	

Appendix D.101 Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 4 for Alder Creek during 1994.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	IO	6.4	6,217	7.7	
Slip face cascade					
Total Cascades	10	**6.4**	**6,217**	**7.7**	
Pocketwater					
Glide	39	24.8	14,391	17.9	
Run					
Low gradient riffie	67	42.7	46,686	58.1	
Total Riffles	**106**	**67.5**	**61,077**	**76.0**	
Dammed pool	I	0.6	493	0.6	0.5
Eddy pool					
Plunge pool	3	I.9	683	0.9	0.4
Scour pool	33	21.0	6,086	7.8	0.4
Scour hole					
Beaver pond	3	I.9	5,863	7.7	0.6
Total Pools	**40**	**25.4**	**13,125**	**17.0**	
Secondary channel					
Grand Totals	**157**		**80,418**		

Appendix D.102 Summary report for Reach # 5 of the Alder Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,900 - 2,940	same
Total length	5,768 ft	4,807 ft
Stream order	4	4
Mean stream gradient	1.4 %	3.6 %
Riffle/pool ratio	1 : 1	6.8 : 1
Land use		
Forest	83.8 %	83.8 %
Agriculture		
Livestock grazing	16.2 %	16.2 %
Mining		
Wetland		
Floodplain		
Other (includes residential.right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100 %	100%
Seral stage		
Grass/forb	29.6 %	29.6 %
Shrub	28.4 %	28.4 %
Pole		
Young		
Mature	6.2 %	6.2 %
Old growth	35.8 %	35.8 %
Other		
x Canopy cover	17.7 %	43.7 %
# Woody debris		
Logs	64	76
Root wads	l	0

Appendix D.103. Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 5 for Alder Creek during 1993.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	I	2.5	218	0.6	
Run					
Low gradient rime	I 9	47.5	19,627	52.6	
Total Riffles	20	50.0	**19,844**	53.2	
Dammed pool					
Eddy pool					
Plunge pool	1	2.5	214	0.6	0.4
Scour pool	I 4	35	1,902	5.1	0.4
Scour hole	I	2.5	101	0.3	0.3
Beaver pond	4	IO	15,221	40.8	0.8
Total Pools	20	50.0	**17,483**	46.8	
Secondary channel					
Grand Totals	**40**		37,282		

Appendix D.1 04. Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 5 for Alder Creek during 1994.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	1	3.1	259	0.6	
Slip face cascade					
Total Cascades	**1**	3.1	259	0.6	
Pocketwater					
Glide	I 2	37.5	3,635	7.9	
Run	I 5	46.9	6,036	13.2	
Low gradient riffle					
Total Riffles	27	84.4	**9,671**	21.1	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	3	9.4	41	0.9	0.7
Scour hole					
Beaver pond	1	3.1	35,454	77.4	0.8
Total Pools	**4**	12.5	35,495	78.3	
Secondary channel					
Grand Totals	32		45,789		

Appendix D.105. Summary report for Reach # 6 of the Alder Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,946 - 3,330 ft	same
Total length	21,754 ft	20,596 ft
Stream order	2	2
Mean stream gradient	1.8 %	5.3 %
Riffle/pool ratio	1 : 1.7	2.4 : 1
Land use		
Forest	95.1 %	95.1 %
Agriculture		
Livestock grazing	4.9 %	4.9 %
Mining		
Wetland		
Floodplain		
Other (includes residential,right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb	21.0 %	21.0 %
Shrub	3.7 %	3.7 %
Pole		
Young		
Mature	75.3 %	75.3 %
Old growth		
Other		
x Canopy cover	25 %	68 %
# Woody debris		
Logs	127	307
Root wads	0	0

Appendix D.106. Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 6 for Alder Creek during 1993.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapic					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide					
Run					
Low gradient riffle	30	36.6	20,923	13.0	
Total Riffles	30	36.6	**20,923**	**13.0**	
Dammed pool					
Eddy pool					
Plunge pool	1	1.2	91.4	0.5	0.8
scour pool	9	11.0	757	0.5	0.3
Scour hole	12	14.6	1,674	1.0	0.3
Beaver pond	30	36.6	136,992	85.0	0.9
Total Pools	52	63.4	**140,311**	87.0	
Secondary channel					
Grand Totals	82	**100**	**161,234**	**100**	

Appendix D.107. Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 6 for Alder Creek during 1994.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	3	13.0	1.217	1.7	
Step pool cascade	3	13.0	3,890	5.3	
Slip face cascade					
Total Cascades	6	26.0	5,107	7.0	
Pocketwater					
Glide	5	21.7	1,542	2.1	
Run					
Low gradient riffle	7	30.4	2.809	3.8	
Total Riffles	12	52.1	4,351	5.9	
Dammed pool					
Eddy pool					
Plunge pool	1	4.4	67	0.09	0.4
Scour pool	1	4.4	61	0.08	0.2
Scour hole					
Beaver pond	3	13.0	63.534	86.9	0.5
Total Pools	5	21.8	63,662	87.1	
Secondary channel					
Grand Totals	23		**73,119.2**		

Appendix D.108. Summary report for Reach # 1 of the North Fork Alder Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	2,940 - 3,070 ft	same
Total length	4,134 ft	5,502.00 ft
Stream order	2	2
Mean stream gradient	3 %	3.1 %
Riffle/pool ratio	1.3 : 1	16 : 1
Land use		
Forest		
Agriculture		
Livestock grazing	loo %	100%
Mining		
Wetland		
Floodplain		
Other (includes residential, right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	loo %
Seral stage		
Grass/forb	100 %	100%
Shrub		
Pole		
Young		
Mature		
Old growth		
Other		
x Canopy cover	36.3 %	68 %
# Woody debris		
Logs	24	22
Root wads	0	0

Appendix D.109. Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 1 for North Fork Alder Creek during 1993.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide					
Run					
Low gradient riffle	9	56.3	10,666	95.3	
Total Riffles	**9**	66.3	10,666	**95.2**	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool	4	25	385	3.4	0.5
Scour hole	3	18.8	155	1.4	0.4
Beaver pond					
Total Pools	7	43.8	**540**	4.8	
Secondary channel					
Grand Totals	**16**	**100**	**11,206**	**100**	

Appendix D.110. Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 1 for North Fork Alder Creek during 1994.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide	8	47.1	1,122	**19.9**	
Run					
Low gradient riffle	8	47.1	**4.441**	78.6	
Total Riffles	16	94.2	5,563	**98.5**	
Dammed pool					
Eddy pool					
Plunge pool	1	**5.9**	87.2	1.5	
Scour pool					
Scour hole					
Beaver pond					
Total Pools	**1**	**5.9**	87.2	1.5	
Secondary channel					
Grand Totals	17		5,651		

Appendix D.111. Summary report for Reach # 2 of the North Fork Alder Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	3,070 - 3,280 ft	same
Total length	11,355 ft	13,946.00
Stream order	2	2
Mean stream gradient	1.9 %	8.7 %
Riffle/pool ratio		
Land use		
Forest	100%	100%
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential, right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	100%
Seral stage		
Grass/forb	1.5 %	11.5 %
Shrub		
Pole		
Young		
Mature	88.5 %	88.5 %
Old growth		
Other		
x Canopy cover	35.2	87.2 %
# Woody debris		
Logs	46	663
Root wads	0	

Appendix D.112. Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and [illegible]lume values for Reach # 2 for North Fork Alder Creek du[illegible]g 1993.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide					
Run					
Low gradient riffle	16	62	32,824	32.9	
Total Riffles	16	62	32,824	32.9	
Dammed pool					
Eddy pool					
Plunge pool	1	3.8	14.6	0.1	0.2
Scour pool	2	7.7	221	0.2	0.3
Scour hole	2	7.7	218	0.2	0.5
Beaver pond	5	19.3	66,548	66.7	0.6
Total Pools	10	36.4	67,002	67.1	
Secondary channel					
Grand Totals	26	99.9	9,826	100	

Appendix D.113. Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 2 for North Fork Alder Creek during 1994.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid	8	40	3.251	4.7	
Step pool cascade	6	30	3,986	5.8	
Slip face cascade					
Total Cascades	14	70	7,237	10.6	
Pocketwater					
Glide					
Run					
Low gradient riffle	3	15	997	1.4	
Total Riffles	3	15	997	1.4	
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool					
Scour hole					
Beaver pond	3		61,054	88.1	0.5
Total Pools	3	[illegible].5	61,064	88.1	
Secondary channel					
Grand Totals	20		59,288		

Appendix D.114. Summary report for Reach # 3 of the North Fork Alder Creek Watershed data collected during 1993 and 1994.

Parameter	1993	1994
Elevation	3,280 - 3,620 ft	
Total length	10,271	
Stream order	2	
Mean stream gradient	7.1 %	
Riffle/pool ratio	2.3 : 1	
Land use		
Forest	100%	
Agriculture		
Livestock grazing		
Mining		
Wetland		
Floodplain		
Other (includes residential, right of way, etc.)		
Vegetative type		
Decidious		
Coniferous		
Mixed	100%	
Seral stage		
Grass/forb		
Shrub	11.5 %	
Pole		
Young	29.3 %	
Mature	70.8 %	
Old growth		
Other		
x Canopy cover	39.0 %	
# Woody debris		
Logs	47	
Root wads	0	

Appendix D.115. Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 3 for Norht Fork Alder Creek during 1993.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade	1	7.1	17.0	0.4	
Slip face cascade					
Total Cascades	1	**7.1**	**17.0**	**0.4**	
Pocketwater					
Glide					
Run					
Low gradient riffle	9	64.3	4,580	97.4	
Total Riffles	**9**	**64.3**	**4,560**	**97.4**	
Dammed pool					
Eddy pool					
Plunge pool	1	7.1	17.1	0.4	0.2
Scour pool	3	21.4	87.5	1.9	0.2
Scour hole					
Beaver pond					
Total Pools	**4**	**28.5**	**105**	**2.2**	
Secondaw channel					
Grand Totals	**14**	**99.9**	**4,682**	**100**	

Appendix D.116. Frequency of occurrence, total percent occurence, total area, percent area, residual pool depth and volume values for Reach # 3 for North Fork Alder Creek during 1994.

Habitat Type	Frequency	% Frequency	Total Area (sq. meters)	% Area	Residual pool depth (m)
Rapid					
Step pool cascade					
Slip face cascade					
Total Cascades					
Pocketwater					
Glide					
Run					
Low gradient riffle					
Total Riffles					
Dammed pool					
Eddy pool					
Plunge pool					
Scour pool					
Scour hole					
Beaver pond					
Total Pools					
Secondary channel					
Grand Totals					

Appendix E

Appendix E.I. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Alder Creek during Spring (May, June), 1993.**

Site **Shock time (min)**	Lower **24.3**	Middle **13.6**	Upper **18.5**
Cutthroat trout		8 (44.4)	
Eastern brook trout		2 (11.1)	9 (100)
Sculpin spp.	14 (87.5)		
Longnosesucker		5 (27.8)	
Longnosedace	2 (11.1)		
Brown bullhead		3 (16.7)	
TOTAL	16	18	9

Appendix E.2. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Evans Creek during Spring (May, June), 1993.**

Site Lower **Shock time (min)**	Middle t	**Upper** ii.6	 27.8
Cutthroat trout		2 (66.7)	
Sculpin spp.		1 (33.3)	4 **(100)**
TOTAL		3	4

Appendix E.3 **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Lake Creek during Spring (May, June), 1993.**

Site Lower **Shock time (min)**	Middle •	Upper **12.4**	 •
Sculpin spp.		2 (66.7)	
Western speckled date		**1** (33.3)	
TOTAL		**3**	

Appendix E.4. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Benewah Creek during Spring (May, June), 1993.**

Site Lower	Middle	Upper	
Shock time (min)	16.4	16.7	21.7
Cutthroat trout	4 (16.0)	2 (6.3)	6 (4.2)
Sculpin spp.		I (3.1)	
Lonanose sucker	15 (60.0)	7 (21.9)	18 (12.7)
Longnose dace			12 (8.4)
Western speckled date		14 (43.8)	1 (0.7)
Redside shiner	.	8 (25.0)	105 (73.9)
Northern Squawfish	6 (24.0)		
TOTAL	25	32	142

Appendix E5. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Coon Creek[1] during Spring (May, June), 1993.**

Site Lower	Upper	
Shock time (min)	13.5	11.8
Cutthroat trout	3 (12.0)	7 (100.0)
Lonanose sucker	3 (12.0)	
Western speckled dace	1 (4.0)	
Redside shiner	18 (72.0)	
TOTAL	25	7

Appendix E.6. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Cow Creek[1] during Spring (May, June), 1993.**

SiteLower	
Shock time (min)	6.4
Longnose sucker	5 (15.2)
Redside shiner	27 (81.8)
Brown bullhead	I(3.0)
TOTAL	33

Appendix E.7. Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Harmony Creek[1] during Spring (May, June), 1993.

Site **Lower**	
Shock time (min)	7.4
Cutthroat trout	6 (42.9)
Sculpin spp.	8 (57.1)
TOTAL	**14**

Appendix E.8. Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Whitetail Creek[1] during Spring (May, June), 1993.

Site **Lower**	**Upper**	
Shock time (min)	10.6	5.1
Cutthroat trout	2 (66.7)	2 (100)
Eastern brook trout	1 (33.3)	
TOTAL	3	2

Appendix E.9. Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Windfall Creek[1] during Spring (May, June), 1993.

Site **Lower**	**Upper**	
Shock time (min)	13.9	6.2
Cutthroat trout	2 (100)	2 (100)
TOTAL	2	2

* site could not be accessed because of deep water

1 Tributaries to Benewah Creek

Table E.10. Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Alder Creek during Summer (August), 1993.

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	14.0	14.9	22.3
Cutthroat trout	2 (5.9)	12 (48.0)	6 (15.8)
Eastern brook trout		7 (28.0)	28 (73.7)
Sculpin spp.	30 (88.2)		4 (10.5)
Lonanose sucker		6 (28.0)	
longnose dace	2 (5.9)		
Brown bullhead			
TOTAL	**34**	25	38

Table E.11. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Evans Creek during Summer (August), 1993.**

Site Lower	Middle	Upper	
Shock time (min)	20.0	20.0	18.8
Cutthroat trout	1 (4.5)	30 (48.4)	56 (57.1)
Sculpin spp.	18 (81.8)	32 (51.6)	42 (42.9)
Longnose sucker	3 (13.6)		
TOTAL	--	62	98

Table E.12. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Lake Creek during Summer (August), 1992.**

Site Lower	Middle	Upper	
Shock time (min)	12.6	17.1	11.6
Cutthroat trout	6 (10.3)	9 (37.5)	6 (60.0)
Sculpin spp.	17 (29.3)	9 (37.5)	2 (20.0)
longnose sucker	1 (1.7)		2 (20.0)
Redside shiner		1 (4.2)	
Longnosedace	34 (58.6)		
TOTAL	**58**	24	[illegible]

Table E.13. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Benewah Creek during Summer (August), 1993.**

Sihock e (min)	Middle	Upper	
ShCutthroat trout	10.4	22.3	26.8
		4 (6.4)	11 (8.0)
Sculpin spp.	7 (53.1)	3 (4.8)	
Longnose sucker	3 (10.3)	12 (19.4)	10 (7.3)
longnose dace	5 (17.2)	24 (38.7)	32 (23.4)
Redside shiner	14 (48.3)	19 (30.6)	84 (61.3)
TOTAL	29	62	137

Table E.14. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Benewah Creek during fall (October), 1993.**

Site	Lower	Middle	Upper
Shock time (min)	15.5	18.7	32.0
Cutthroat trout	(13.3)	6 (31.6)	9 (25.0)
Eastern brook trout			1 (2.8)
Rainbow trout	(6.7)		
Sculpin spp.	33.3)	3 (15.8)	9 (25.0)

Table E.14. (continued): Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Benewah Creek during fall (October), 1993.

	Lower	Middle	Upper
Shock time (min)	15.5	18.7	32.0
Longnose sucker	8 (26.7)	6 (31.6)	6 (16.7)
Largemouth bass	2 (6.7)		
Redside shiner	4 (13.3)	4 (21.1)	11 (30.6)
TOTAL	30	19	36

Table E.15. Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Lake Creek during fall (October), 1993.

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	29.7	15.2	13.7
Cutthroat trout	11 (31.4)		
Sculpin spp.	14 (40.0)	22 (100.0)	7 (53.8)
Bull trout	1 (2.9)		
Longnosesucker	9 (25.7)		6 (46.2)
TOTAL	35	22	13

Table E.16. Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Evans Creek during fall (October), 1993.

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	8.4	33.2	32.4
Cutthroat trout		38 (71.7)	31 (54.4)
Sculpin spp.	6 (100.0)	15 (28.3)	26 (45.6)
TOTAL	**6**	**53**	**57**

Table E.17. Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Alder Creek during fall (October), 1993.

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	11.4	28.1	18.7
Cutthroat trout		14 (56.0)	2 (8.7)
Eastern brook trout		2 (8.0)	21 (91.3)
Sculpin spp.	11 (64.6)	5 (20.0)	
Longnosesucker	2 (15.4)	4 (16.0)	
TOTAL	**13**	25	23

Table E.18. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Alder Creek during Spring (May, June), 1994.**

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	11.4	13.6	13.3
Cutthroat trout	3 (12.0%)	13 (43.3%)	
Eastern brook trout	4 (16.0%)	13 (43.3%)	11 (100.0%)
Sculpin spp.	11 (44.0%)	3 (10.0%)	
Longnose sucker	7 (28.0%)	1 (3.3%)	
TOTAL	**25**	**30**	**11**

Table E.19. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Evans Creek during Spring (May, June), 1994.**

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	9.9	13.3	11.7
Cutthroat trout		8 (34.8%)	24 (82.8%)
Sculpin spp.	11 (100%)	15 (65.2%)	5 (17.2%)
TOTAL	**11**	**23**	**29**

Table E.20. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Lake Creek during Spring (May, June), 1994.**

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	13.0	*	12.7
Cutthroat trout	5 (16.7%)	1 (7.1%)	2 (22.2%)
Sculpin	14 (46.7%)	11 (78.6%)	7 (77.8%)
Redside shiner		2 (14.3%)	
Longnose sucker	11 (36.7%)		
TOTAL	**30**	**14**	**9**

Table E.21. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Benewah Creek during Spring (May, June), 1994.**

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	13.7	14.2	12.2
Cutthroat trout	6 (15.8%)	4 (16.7%)	3 (9.1%)
Sculpin spp.	12 (31.6%)	3 (12.5%)	2 (6.1%)
Longnose sucker	16 (42.1%)	9 (37.5%)	21 (63.6%)
Redside shiner	3 (7.9%)	8 (33.3%)	7 (21.2%)
Northern Squawfish	1 (2.6%)		
TOTAL	**38**	**24**	**33**

Table E.22. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Alder Creek during Summer (August), 1994.**

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	14.7	14.8	14.1
Cutthroat trout	2 (6.4%)	21 (44.7%)	3 (6.4%)
Eastern brook trout		18 (36.3%)	43 (93.5%)
Sculpin spp.	25 (80.7%)		1 (2.1%)
Longnose sucker	4 (12.9%)	8 (17.0%)	
TOTAL	**31**	47	47

Table E.23. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Evans Creek during Summer (August), 1994.**

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	10.7	6.8	5.2
Cutthroat trout	0	17 (100%)	1 (11.1%)
Sculpin spp.	21 (65.6%)		8 (88.9%)
Longnose sucker	4 (12.5%)		
Redside shiner	6 (18.8%)		
Brown bullhead	1 (3.1%)		
TOTAL	**32**	**17**	**9**

Table E.24. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Lake Creek during Summer (August), 1994.**

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	7.9	10.9	10.8
Cutthroat trout		18 (51.4%)	
Sculpin spp.		2 (5.7%)	8 (61.5%)
longnose sucker	4 (57.1%)	5 (14.3%)	5 (38.5%)
Redside shiner	3 (42.9%)	6 (17.1%)	
Western speckled dace		4 (11.4%)	
TOTAL	7	35	13

Table E.25. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Benewah Creek during Summer (August), 1994.**

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	8.0	9.2	9.1
Cutthroat trout		1.0 (3.3%)	
Sculpin spp.	15 (51.7%)	6 (20.0%)	
Longnose sucker	4 (13.8%)	2 (6.7%)	
Redside shiner	10 (34.5%)	21 (70.0%)	100 (100.0%)
TOTAL	**29**	**30**	**100**

Table E.26. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Benewah Creek during fall (October), 1994.**

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	16.5	22.9	23.0
Cutthroat trout	3 (7.7%)	1 (2.1%)	
Sculpin spp.	6 (15.4%)	15 (31.2%)	12 (4.1%)
Longnose sucker	7 (18.0%)	13 (27.1%)	15 (5.1%)
Redside shiner	23 (59.0%)	19 (39.6%)	268 (90.9%)
TOTAL	**39**	**48**	**295**

Table E.27. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Lake Creek during fall (October), 1994.**

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	17.8	*	19.4
Cutthroat trout		8 (18.2%)	
Sculpin spp.	9 (22.5%)	27 (61.4%)	5 (15.6%)
Longnose sucker	16 (40.0%)	9 (20.5%)	4 (12.5%)
Redside shiner	15 (37.5%)		23 (71.9%)
TOTAL	**40**	**44**	**32**

Table E.28. **Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Evans Creek during fall (October), 1994.**

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	12.0	*	26.6
Cutthroat trout	1 (12.5%)		26 (53.1%)
Sculpin spp.	2 (25.0%)		23 (46.9%)
Largemouth bass	5 (62.5%)		
TOTAL	**8**		**49**

Table E.29. Total number and relative abundance (%) of each species caught during relative abundance electrofishing surveys on Alder Creek during fall (October), 1994.

Site **Lower**	**Middle**	**Upper**	
Shock time (min)	23.9	25.6	21.1
Cutthroat trout	2 (10.5%)	21 (63.6%)	7 (10.6%)
Eastern brook trout	2 (10.5%)	12 (36.4%)	27 (40.9%)
Sculpin spp.	15 (78.9%)		32 (48.5%)
TOTAL	**19**	**33**	**66**

Appendix F

APPENDIX F.I: **Water Quality Data collected using a price pygmy meter (discharge) and Hydrolab in selected tributaries during 1993.**

LOCATIO	DATE	pH	Q (cfs)	(°C)	K (mmhoslcm)	DO (ppm)	REDOX (mV)
ALDER	3/11/93		11.62	2.3	0.880	16.89	298
ALDER	3/16/93	7.2	38.16	2.6	0.073	16.39	289
ALDER	3/23/93		168.10	36			
ALDER	4/14/93	7.2	44.70	7.5	0.069	10.93	
ALDER	5/4/93	6.8	289.00	41F	0.041		
ALDER	6/28/93	7.2	2.82	12.5	0.081	8.88	288
ALDER	7/27/93	6.9	4.69	13.0	0.071	8.29	273
ALDER	8/24/93	6.7	1.68	12.8	0.092	1.54	270
ALDER	9/20/93	7.2	1.09	7.8	0.092	9.57	313
ALDER	10/28/93	7.2		2.9	0.091	14.66	842
ALDER	11/19/93	6.3	1.94	0.5	0.091	15.68	
BENEWAI	1/20/93			31			
BENEWAI	3/11/93		31.98	3.1	0.840	14.24	309
BENEWAI	3/16/93	7.2	68.88	4.2	0.080	13.01	308
BENEWAI	3/23/93		350.10	37			
BENEWAI	4/14/93	7.2	85.94	41	0.060	13.47	
BENEWAI	5/4/93	7.0	676.00	44F	0.042		
BENEWAI	6/28/93	7.4	2.60	15.6	0.057	11.02	278
BENEWAI	7/28/93	7.4	11.48	18.8	0.060	8.23	260
BENEWAI	8/24/93	6.9	0.83	11.9	0.071	2.15	286
BENEWAI	9/20/93	7.3	0.35	10.8	0.069	10.60	415
BENEWAI	10/28/93	7.5	1.98	7.2	0.090	11.45	874
BENEWAI	11/19/93	6.4	3.78	0.7	0.070	14.77	939
EVANS	1/20/93		6.47	30			
EVANS	3/11/93		19.60	2.8	0.054	14.48	302
EVANS	3/16/93	7.0	26.55	3.9	0.068	14.45	302
EVANS	3/23/93		181.70	38			
EVANS	4/15/93	7.2	47.85	39	0.050	22.00	291
EVANS	5/4/93	7.0	456.00	42F	0.026		
EVANS	6/28/93	6.6	5.11	10.6	0.030	9.93	313
EVANS	7/28/93	6.6	'6.80	11.8	0.034	8.45	312
EVANS	8/24/93	7.0	3.56	11.6	0.039	1.33	266
EVANS	9/20/93	7.0	3.05	7.9	0.000	10.79	446
EVANS	10/28/93	6.9	2.27	6.2	0.009	10.30	910
EVANS	11119193	6.7	6.49	1.8	0.035	13.80	133

Appendix F.I: (cont.)

LAKE	1/25/93	6.7	4.51	18.0	0.107	14.60	
LAKE	3/11/93	7.0	41.17	0.8	0.136	13.07	311
LAKE	3/16/93	6.8	57.06	3.3	0.104	11.78	332
LAKE	3/23/93		700.00	36			
LAKE	4/14/93	7.2	51.35	5.9	0.091	13.02	
LAKE	5/4/93	7.0	840.00		0.070		
LAKE	6/28/93	7.2	3.97	13.4	0.045	15.00	240
LAKE	7/28/93	7.0	6.18	15.6	0.056	7.36	275
LAKE	8/24/93	7.1	1.34	14.1	0.059	1.21	299
LAKE	9/20/93	7.2	1.48	6.9	0.060	10.38	469
LAKE	10/28/93	7.0	0.82	2.4	0.061	15.09	942
LAKE CONTROL	3/23/93						
LAKE-DOWNSTREAM		3/16/93					
LAKE-DOWNSTREAM		3/23/93					

APPENDIX F.2: Monthly Water Quality Parameters for selected Coeur d'Alene tributaries during 1993.

LOCATION	DATE	TURB (NTU)	TSS (mg/l)	NO3 (ppm)	NO3 (ppm)	NO2 (ppm)	NO2 (ppm)	TOT N (mg/l)	TKN (mg/l)	PO4 (ppm)	IRON (ppm	ALK (ppm)	Cl (mg/l)	Total P (mg/l)
ALDER	3/11/93													
ALDER	3/16/93	27	18	0.29	1.28	0.07	0.23			0.70	0.94	30		
ALDER	3/23/93	75	100											
ALDER	4/14/93	9	7.5	0.04	0.18	0.02	0.07			0.01	0.29	40		
ALDER	5/4/93	320	5940					0.01	6.50				2	1.50
ALDER	6/28/93	18	2.75	0.00		0.03				0.01	0.60			
ALDER	7/27/93	24	66	0.08		0.01				0.81		30		
ALDER	8/24/93	24	6	0.00		0.03				3.00		60		
ALDER	9/20/93	38	8							0.07		70		
ALDER	10/28/93	18		0.04		0.03				1.18		50		
ALDER	11119193	172		0.00		0.00				0.01		70		
BENEWAH	1/20/93													
BENEWAH	3/11193													
BENEWAH	3/16/93	46	26.7	0.29	1.28	0.01	0.03			0.44	1.98	30		
BENEWAH	3/23/93	164	1093.3											
BENEWAH	4/14/93	40	12	0.00		0.01	0.03			0.07	0.80	50		
BENEWAH	5/4/93	87	640					0.04	0.87				1	0.72
BENEWAH	6/28/93	12	1.25	0.00		0.00				1.43	0.60			
BENEWAH	7/28/93	24	8	0.00		0.01				0.12		30		
BENEWAH	8/24/93	12	2	0.00		0.06				1.11		50		
BENEWAH	9/20/93	24	30							0.00		50		
BENEWAH	10/28/93	12		0.00		0.03				0.52		50		
BENEWAH	11/19/93	12		0.00		0.00				0.00		50		
EVANS	1/20/93													
EVANS	3/11/93													
EVANS	3/16/93	>500	6.7	0.00		0.00				0.18	0.60	30		
EVANS	3/23/93	35	106.7											
EVANS	4/15/93	30	2.25	0.00		0.04	0.13			0.91	0.29	20		
EVANS	5/4/93	30	460					0.01	0.25				2	0.18
EVANS	6/28/93	0	2.5	0.00		0.03				0.00	0.34			
EVANS	7/28/93	0	2	0.00		0.00				0.00		30		
EVANS	8/24/93	5	10	0.00		0.08				0.18		30		
EVANS	9/20/93	5	2							0.07		40		
EVANS	10/28/93	12		0.00		0.03				1.68		40		
EVANS	11/19/93	0		0.00		0.00				0.40		50		
LAKE	1/25/93													
LAKE	3/11193													

Appendix F.2. (cont.)

LOCATION	DATE	TURB (NTU)	TSS (mg/l)	NO3 (ppm)	NO3 (ppm)	NO2 (ppm)	NO2 (ppm)	TOT N (mg/l)	TKN (mg/l)	PO4 (ppm)	IRON (ppm	ALK (ppm)	Cl (mg/l)	Total P (mg/l)
LAKE	3/16/93	35		>3.58	15.75	0.04	0.13			0.36	0.85	30		
LAKE	3/23/93		286.7											
LAKE	4/14/93	195	265	1.03	4.53	0.03	0.10			2.30	3.12	40		
LAKE	5/4/93	75	280					1.00	0.56				2	0.22
LAKE	6/28/93	9	9.25	0.00		0.01				0.23	0.94			
LAKE	7/28/93	24	19	0.00		0.04				0.44		30		
LAKE	8/24/93	18	5	0.00		0.08				0.27		30		
LAKE	9/20/93	21	10							0.07		40		
LAKE	10/28/93	18		0		0.03				1.92		50		
LAKE CONTROL	3/23/93	286												
LAKE-DOWNSTREAM	3/16/93		86.7											
LAKE-DOWNSTREAM	3/23/93	>500												

Appendix F.3: **Water Quality data collected using price pygmy meter (discharge) and Hydrolab multi-meter in selected tributaries during 1994.**

LOCATION	DATE	Q (cfs)	(C^o)	CONDUCTIVITY (mmhos/cm)	DO (ppm)	REDOX (mV)	STAGE
ALDER	3/22/94	19.01	1.13	0.0386	13.98	379	1.48
ALDER	4/22/94	14.48	5				1.4
ALDER	5/18/94	9.03	9.76	0.0671	11.31	278	1.2
ALDER	6/22/94	1.8		0.0761	9.15	277	1.1
ALDER	8/29/94	<.5	16.48	0.0964	7.38	493	
ALDER	9/20/94	<.5	13.33	0.095	8.32	277	
ALDER	10/18/94	1.46	5.7	0.0935	8.75	347	
ALDER	11116194	2.79	0.87	0.0963	9.93	354	1.16
BENEWAH	3/22/04	32.09	2.04	0.0408	14.08	416	0.57
BENEWAH	4/18/94	2.93	16.83	0.0424	8.82	336	0.68
BENEWAH	5/16/94	7.18	17.35	0.0569	9.45	345	0.1
BENEWAH	6/22/94	2.38	28.07	0.059	8.18	177	
BENEWAH	7/18/94	2.24	23.31	0.069	9.14	160	
BENEWAH	8/29/94	<.5	17.07	0.0938	9.62	368	
BENEWAH	9/19/94	0.56	10.2	0.0904	10.2	378	0
BENEWAH	10/18/94	1.34	7.79	0.0758	9.33	394	0
BENEWAH	11/16/94	7.48	1.72	0.0615	10.81	338	0.24
EVANS	3/21/94	15.68	3.66	0.0221	13.56	407	
EVANS	4/19/94	32.79	6.97	0.0156	10.94	328	
EVANS	5/16194	15.74	8.24	0.0117	11.5	336	3.11
EVANS	6/20/94	2.61	12.03	0.0248	10.45	326	3.05
EVANS	7/18/94	3.49	13.99	0.0282	10.02	279	3.1
EVANS	8/29/94	1.77	12.67	0.0289	9.18	360	
EVANS	9/19/94	1.4	11.6	0.0396	9.6	356	
EVANS	10119194	1.25	6.41	0.0314	9.44	466	
EVANS	11115194	3.57	2.74	0.0303	10.55	412	
LAKE	1/4/94	63.82	0.17	0.0544	8.15	339	
LAKE	2/18/94	12.26	0				
LAKE	3/21/94	38.41	2.35	0.0553	13.8	385	1
LAKE	4/18/94	18.96	9.94	0.0376	9.43	367	
LAKE	5/16/94	6.02	9.63	0.0404	11.05	357	0.3
LAKE	6/22/94	1.78	15.92	0.9431	9.71	227	
LAKE	7/18/94	0.32	20.06	0.0912	8.58	176	
LAKE	8/29/94	<.01	11.33	0.0233	7.67	337	
LAKE	9/19/94	0.5	14.86	0.0833	8.8	337	
LAKE	10117/94	0.57	5.19	0.0613	9.95	366	
LAKE	11/15/94	2.88	1.02	0.0514	1118	455	

Appendix F.4: Monthly Water Quality Parameters for selected Coeur d' Alene tributaties in 1994.

LOCATION	DATE	pH	TUR (NTU)	TSS (mg/l)	NO^3(ppm)	NO^2 (ppm)	PHOSPHATE (ppm)	IRON (ppm)	ALKALINITY (ppm)
ALDER	3/22/94	7.48	15		0	0.03	0		55
ALDER	4/22/94		5			0.01			5
ALDER	5/18/94	7.75	18		0	0.01	0.07		60
ALDER	6/22/94	8.24	21		0.04	0.08	0.12		75
ALDER	8/29/94	6.69	24			0.05	0.07		50
ALDER	9/20/94	7	24			0.08	0.18		70
ALDER	10/18/94	6.99	15		0.05		0.07		70
ALDER	11/16/94	7.16							
BENEWAH	3/22/04	7.69	30		0	0.03	0.07		40
BENEWAH	4/18/94	7.78	9	10		0.01	0.01		5
BENEWAH	5/16/94	7.08	24		0	0	0.07		60
BENEWAH	6/22/94	10.33	15			0.08	0.18		50
BENEWAH	7/18/94	IO.68	50			6	0.12		50
BENEWAH	8/29/94	8.26	12			0.01	0.07		35
BENEWAH	9/19/94	7.86	12			0.08	0.12		70
BENEWAH	10/18/94	7.69	9			0.04	0.07		70
BENEWAH	11/16/94	7.35							
EVANS	3/21/94	7.2	5		0	0.05	0.01		40
EVANS	4/19/94	6.92	3	6			0.07		4
EVANS	5/16/94	6.88	0		0	0.02	0.01		50
EVANS	6/20/94	8.07	5			0.07	0.07		70
EVANS	7/18/94	8.51	5			0.04	0.01		50
EVANS	8/29/94	7.01	0			0.03	0.01		35
EVANS	9/19/94	7.05	5		0	0.03	0.01		50
EVANS	10/19/94	6.87	5		0	0.08	0.01		50
EVANS	11/15/94	7.01							
LAKE	1/4/94	8	54		0.98	0.03	0.27		40
LAKE	2/18/94			43					
LAKE	3/21/94	7.36	40		0.61	0.03	0.07		30
LAKE	4/18/94	7.21	9	7			0.01		3
LAKE	5/16/94	6.54	21		0	0.03	0.07		40
LAKE	6/22/94	8.93	9		0.09	0.09	0.32		45
LAKE	7/18/94	8.51	15			0.07	0.4		50
LAKE	8/29/94	7.33	12			0.05	0.12		40
LAKE	9/19/94	7.24	18			0.03	0.27		50
LAKE	10/17/94	7.1	9			0.08	0.18		60
LAKE	11/15/94	7.09							

Coeur d'Alene Tribe
Fish, Water, and Wildlife Program

Supplementation Feasibility Report
on the
Coeur d'Alene Indian Reservation

Coeur d'Alene Tribe Department of Natural Resources
Fish, Water, and Wildlife Program
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Coeur d'Alene Tribe
Fish, Water, and Wildlife Program

Supplementation Feasibility Report
on the
Coeur d'Alene Indian Reservation

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Table of Contents

1.0 Introduction 1

1.1 Study Area 3
Coeur d'Alene Lake
Target Tributaries

2.0 Methods and Materials 4

2.1 Lake Studies 4
2.1.1 Water Quality 4
2.1.2 Fisheries 8

2.2 Stream Studies 10
2.2.1 Water Quality 10
2.2.2 Habitat Suitability Index 11
2.2.3 Fisheries 12

3.0 Results 18

3.1 Lake Studies 18
3.1.1 Water Quality 18
3.1.2 Fisheries 37

3.2 Stream Studies 38
3.2.1 Water Quality 38
3.2.2 Habitat Suitability Indices 43
3.2.3 Fisheries 44

4.0 Discussion 54

4.1 Limiting Factors 54

4.2 Supplementation Feasibility 58

5.0 Bibliography 62

Appendix A. Vertical hydrolab profiles of thirteen stations on Coeur d'Alene Lake, 1997.

Appendix B. Secchi readings and empirically derived estimates of euphotic zone depth for thirteen stations on Coeur d'Alene Lake, 1997.

Appendix C. Cohort analysis of growth for cutthroat trout and brook trout, 1996-1997.

List of Tables

Table 1.1 Basin morphometry of the Lake Creek, Benewah Creek, Alder Creek and Evans Creek 4
watersheds.

Table 2.1 Geomorphologically similar water quality sample sites on Coeur d'Alene Lake....................... 6

Table 2.2 Streams sampled for water quality parameters 11

Table 2.3 Juvenile and adult fish traps were operated at 11 different locations in the four target............ 18
drainages.

Table 3.1 Sample stations on Coeur d'Alene Lake that had a dissolved oxygen reading less than 19
6.0 mg/L.

Table 3.2 Total suspended solids (mg/L) results from epilimnion of Coeur d'Alene Lake...................... 29

Table 3.3 Total suspended solids (mg/L) results from hypolimnion of Coeur d'Alene Lake 29

Table 3.4 Turbidity (NTU) results from epilimnion of Coeur d'Alene Lake. 31

Table 3.5 Turbidity (NTU) results from hypolimnion of Coeur d'Alene Lake 31

Table 3.6 Ortho-Phosphate (mg/L) results from epilimnion of Coeur d'Alene Lake 32

Table 3.7 Ortho-Phosphate (mg/L) results from hypolimnion of Coeur d'Alene Lake............................ 32

Table 3.8 Nitrate (mg/L) results from epilimnion of Coeur d'Alene Lake.. 33

Table 3.9 Nitrate (mg/L) results from hypolimnion of Coeur d'Alene Lake 33

Table 3.10 Nitrite (mg/L) results from epilimnion of Coeur d'Alene Lake. 34

Table 3.11 Nitrite (mg/L) results from hypolimnion of Coeur d'Alene Lake. 34

Table 3.12 Average annual and seasonal Secchi and euphotic zone measurements on……………….. 35
Coeur d'Alene Lake.

Table 3.13 Chlorophyll$_a$ (µg/L) results from epilimnion of Coeur d'Alene Lake……………………… 36

Table 3.14 Chlorophyll$_a$ (µg/L) results from hypolimnion of Coeur d'Alene Lake……………………. 36

Table 3.15 Electrofishing relative abundance from 1994-1997. ……………………………………….. 37

Table 3.16 Electrofishing catch per unit effort (CPUE) from 1994-1997. …………………………….. 39

Table 3.17 Gillnetting relative abundance from 1994-1997. …………………………………………... 40

List of tables continued-

Table 3.18 Gillnetting catch per unit effort (CPUE) from 1994-1997. ………………………………… 41

Table 3.19 Habitat suitability index for lacustrine cutthroat trout……………………………………… 42

Table 3.20 Habitat suitability index for riverine cutthroat trout………………………………………… 43

Table 3.21 Cutthroat trout abundance and distribution 1996. ………………………………………….. 45

Table 3.22 Cutthroat trout abundance and distribution 1997. ………………………………………….. 46

Table 3.23 Age frequency of cutthroat trout 1997. …………………………………………………….. 47

Table 3.24 Brook trout abundance and distribution 1997. ……………………………………………... 48

Table 3.25 Mean back calculated lengths (mm) at age for cutthroat trout 1996……………………….. 48

Table 3.26 Mean back calculated lengths (mm) at age for cutthroat trout 1997……………………….. 48

List of Figures

Figure 2.1 Coeur d'Alene Lake water quality sample sites. 5

Figure 2.2 Coeur d'Alene Lake fisheries sample sites. 9

Figure 2.3 Lake Creek shock sites. 13

Figure 2.4 Benewah Creek shock sites. 14

Figure 2.5 Evans Creek shock sites. 15

Figure 2.6 Alder Creek shock sites. 16

Figure 3.1 pH profiles for three similar locations on Coeur d'Alene Lake, 1997 20

Figure 3.2 Conductivity profile Coeur d'Alene River, 1997. 21

Figure 3.3 Temperature profiles for Round Lake and Chatcolet shallow sampling stations, 1997. 23

Figure 3.4 Temperature profiles for Benewah Lake, Chatcolet Lake and Hidden Lake, 1997. 24

Figure 3.5 Temperature profiles for Rockford, Carey, Windy Bays, 1997. 25

Figure 3.6 Temperature profiles for Windy Bay deep, Mid Lake and Conkling Point, 1997. 26

Figure 3.7 Temperature profiles for Coeur d'Alene River, 1997. 27

Figure 3.8 Temperature profiles for St. Joe River, 1997. 28

Figure 3.9 Regression equations of body length and age for cutthroat and brook trout, 1996. 49

Figure 3.10 Regression equations of body length and age for cutthroat and brook trout, 1997. 50

Figure 3.11 Cutthroat trout migration timing in Lake Creek, 1996. 52

Figure 3.12 Cutthroat trout migration timing in Lake Creek, 1997. 53

Figure 4.1 Supplementation flow chart. 61

Abstract

This study was initiated to respond to concerns regarding recent declines in native salmonid fish populations, particularly westslope cutthroat trout (*Oncorhynchus clarki*) and bull trout (*Salvelinus confluentus*), in the Coeur d'Alene basin. These declines are a result of anthropogenic disturbances that include construction of Post Falls Dam, major alterations in land cover types, changing land use patterns, and introduction of exotic fish species. This report 1) examines the effects of lake and stream habitat, species interactions and water quality on cutthroat trout population dynamics; 2) provides population estimates for westslope cutthroat trout in target tributaries; 3) defines supplementation and evaluates the role that supplementation may play in rebuilding cutthroat trout stocks on the reservation; and 4) develops the framework for constructing a hatchery and implementing a supplementation program.

Water quality in Coeur d'Alene Lake has a detrimental effect on habitat suitability for cutthroat trout. Temperatures recorded in the upper 10 meters of the water column are generally outside of the optimal range for rearing. Furthermore, the euphotic zone rarely drops below 10 meters so foraging runs require fish to enter areas with potentially stressful conditions. Indirect effects related to low dissolved oxygen concentrations, total suspended solids, and large masses of aquatic macrophytes effectively limit the cutthroat trout population in the areas where these conditions exist. Specifically, these areas include the littoral zones less than 10 meters deep, which are most affected by construction of Post Falls Dam.

Competition occurs between cutthroat trout and other fish species in the lake. The introduction of non-native species has altered the historic behavioral pattern of cutthroat trout in both the littoral and limnetic zones. Introduced species comprised over 68 percent of the catch in relative abundance studies from 1994-1997 while cutthroat trout comprised less than 1 percent of the catch. Five introduced species have been demonstrated to actively feed on other fish species, including adult and juvenile cutthroat trout. Historically, bull trout and northern squawfish were the only predators of cutthroat trout in the lake.

The availability of summer rearing habitat for cutthroat trout is a primary constraint on tributary populations. The range of suitable summer rearing habitat in each of the target watershed is significantly reduced when compared with the historic range of the fish. Population estimates have consistently shown that abundance of juvenile cutthroat trout is greatest in first and second order tributaries, where water quality conditions are most favorable. Typical base flow conditions, however, force juvenile trout into small pools where competition for space and food may occur. Furthermore, displacement into water quality limited reaches may be a significant source of mortality. Application of habitat suitability indices indicates that improving habitat condition through restoration and protection has the potential to partially compensate for short-term degradation in water quality.

Due to the persistence of adverse conditions in natal streams and Coeur d'Alene Lake, cutthroat trout populations are thought to be at least moderately damaged. Based on the analysis of limiting factors, gains from habitat restoration and protection alone will not achieve the goals set forth by the Coeur d'Alene Tribal Council to provide for self-sustaining populations and harvestable numbers of cutthroat trout. Supplementation is proposed as an additional means to boost the population density above a certain minimum viable population size. The minimum viable spawning escapement size and the minimum effective breeding number are values that are currently under investigation and will need to be refined to develop an initial management strategy. The most effective management strategy would employ a supplementation program to a level that minimizes the risk of extirpation.

1.0 Introduction

Recent declines in native salmonid fish populations, particularly westslope cutthroat trout (*Oncorhynchus clarki*) and bull trout (*Salvelinus confluentus*), in the Coeur d' Alene basin have been the focus of study by the Coeur d' Alene Fish, Water, and Wildlife program since 1990. In fact, early studies on Coeur d'Alene Lake showed that significant declines had occurred as early as 1932. It appears that there are a number of factors that contributed to the decline of resident fish stocks within Coeur d'Alene Lake and its tributaries (Ellis 1932; Oien 1957; Mallet 1969; Scholz et. al. 1985, Lillengreen et. al. 1993). These factors include: construction of Post Falls Dam in 1906; major changes in land cover types from primarily forested areas to forests with recent and recovering clearcuts, agricultural and pasture lands, urban development, mining and open range land; and introduction of exotic fish species.

Over 100 years of mining activities in the Silver Valley have had devastating effects on the quality of the water in the Coeur d'Alene River drainage and Coeur d'Alene Lake. Effluent from tailings and mining waste have contributed vast quantities of trace heavy metals to the system. Poor agricultural and forest practices have also contributed to the degradation of water quality and habitat suitability for resident salmonids. Increased sediment loads from agricultural runoff and recent and recovering clearcuts, and increases in water temperature due to riparian canopy removal may be two of the most important problems currently affecting westslope cutthroat trout. Increases in water temperature have reduced the range of resident salmonids to a fraction of its historic extent. Within this new range, sediment has reduced the quality of both spawning and rearing habitats. Historically, municipal waste contributed large quantities of phosphates and nitrogen that accelerated the eutrophication process in Coeur d'Alene Lake. However, over the last 25 years work has been completed to reduce the annual load of these materials. Wastewater treatment facilities have been established near all major municipalities in and around the basin.

Species interactions with introduced exotics as well as native species are also acting to limit cutthroat trout populations. Two mechanisms are at work: interspecific competition, and species replacement. Competition occurs when two species utilize common resources, the supply of which is short; or if the resources are not in short supply, they harm each other in the process of seeking these resources. Replacement occurs when some environmental or anthropogenic change (e.g., habitat degradation, fishing pressure, etc.) causes the decline or elimination of one species and another species, either native or introduced, fills the void left by the other.

Within their historic range, cutthroat trout evolved with few other fish species. Thus, they developed as “generalists” and are more susceptible to interspecific interactions than other fish which evolved in the presence of multiple species (Griffith, 1988). In the Coeur d’Alene basin, it is most likely that environmental conditions, rather than competition through interspecific interactions, shaped cutthroat trout behavior and morphology. Rapid changing environmental conditions in the Coeur d’Alene Basin has allowed introduced exotics, and native species other than cutthroat trout to proliferate. This has been shown to be true in the Columbia River system where dam construction has altered the fish species composition and allowed northern squawfish (*Ptychocheilus oregonensis* Richardson) to effectively reduce the numbers of juvenile salmon migrating downstream (Beamesderfer and Rieman 1991).

There are twenty-one identified species of fish inhabiting the Coeur d'Alene Lake study area, of which only seven are indigenous species. The indigenous species are cutthroat trout, bull trout, northern squawfish, largescale sucker (*Catostomus macrocheilus* Girard), longnose sucker (*Catostomus catostomus* Forster), mountain whitefish (*Prosopium williamsoni* Girard), and sculpin (*Cottus* sp.). The introduced exotic species include yellow perch (*Perca flavescens* Mitchill), pumpkinseed (*Lepomis gibbosus* Rafinesque), largemouth bass (*Micropterus salmoides* Lacepede), black crappie (*Pomoxis* *nigromaculatus* Lesuerur), brown bullhead (*Ictalurus neblosus* Lesuerur), black bullhead (*Ictalurus melas* Rafinesque), channel catfish (*Ictalurus punctatus* Rafinesque), tench (*Tinca tinca* Linnaeus), northern pike (*Esox lucius* Linnaeus), kokanee salmon (*Oncorhynchus nerka* Walbaum), chinook salmon (*Oncorhynchus tshawytscha* Walbaum), smallmouth bass (*Micropterus dolomieui* Lacepede), rainbow trout (*Oncorhynchus mykiss*), and lake superior whitefish (*Coregonis clupeaformis* Mitchell). The Idaho Department of Fish and Game has been stocking and/or managing for exotic species in Coeur d'Alene Lake for over 50 years, most notably kokanee salmon (1937), chinook salmon (1982), and northern pike (unknown). Other studies have indicated that most of these species can competitively exclude or replace cutthroat trout in both stream and lake environments (Griffith, 1972, 1974, 1988; Moyle and Vondracek, 1985; and Marnell, 1986, 1987, 1988).

Westslope cutthroat trout and bull trout exhibit three primary life history forms: adfluvial, fluvial, and resident. Of these forms, adfluvial production is considered the most important in the Coeur d' Alene basin. The reasons for this are that they attain the largest size and played an important role in the subsistence economy of the Coeur d'Alene Tribe. Adfluvial salmonids move through many different habitats during their life history, thus production is governed by a wide variety of physical, chemical, and biological influences. In particular, they differ from fluvial and resident forms in that they are dependent on both the tributary and lake environments for completion of their life cycle. Because of this dependency on multiple habitats, they are more sensitive to widespread changes in habitat quality and complexity than the fluvial and resident forms. Furthermore, the maximum potential for interaction with introduced exotic species is realized in the adfluvial life history strategies of the westslope cutthroat trout and bull trout. During the course of their lifecycle, they interact with all other species either through predation by other piscivorous fishes or through competition for living space and food.

Work conducted by the Coeur d'Alene Tribe Fish, Water and Wildlife Program has helped determine that habitat components utilized in each of the three critical life history phases, as well as interactions with introduced species, potentially limit production of adfluvial fishes. These components include spawning habitat and juvenile rearing habitat in tributary streams, and adult rearing habitat in the lake. In order to effectively increase populations of westslope cutthroat trout, habitat restoration must take place in natal streams. However, restoration of the critical tributary habitat does not guarantee increases in adfluvial trout production because adfluvial westslope cutthroat trout reside in Coeur d'Alene Lake for two-thirds of their life cycle. Evidence suggests that production of cutthroat trout is indirectly limited by lake habitat features, but the extent of this limitation is not fully understood.

It is the intent of the Coeur d'Alene Tribe Fish, Water and Wildlife program to increase native populations of bull trout and cutthroat trout to sustainable and harvestable levels. This will be achieved through restoration of critical tributary habitat and management of limiting factors in the lake. This report will examine, in as much detail as possible, the specific abiotic and biotic factors affecting the cutthroat trout population in Coeur d'Alene Lake and its tributaries. Options will be provided for the effective restoration of adfluvial cutthroat trout populations which will best serve the Coeur d' Alene Tribe's goal of self-sustaining and harvestable stocks of bull trout and westslope cutthroat trout.

In order to determine what steps are necessary to rebuild existing trout populations to self-sustaining and harvestable levels on the Coeur d'Alene Reservation, the following goals and objectives have been identified:

- Determine the effect lake habitat, species interactions, and water quality have on cutthroat trout populations.
- Evaluate the effects of habitat, water quality and interspecific interactions on cutthroat trout population dynamics in target watersheds.

- Provide population estimates of westslope cutthroat trout in target watersheds.
- Define supplementation and evaluate the role that supplementation may play in rebuilding cutthroat trout stocks in target watershed on the Coeur d'Alene Indian Reservation.
- Develop the framework for constructing a hatchery and implementing a supplementation program.

These objectives are designed to facilitate the decision making process regarding the need and/or feasibility of supplementing the adfluvial cutthroat trout population in Coeur d'Alene Lake.

1.1 Study Area

Coeur d'Alene Lake
Coeur d'Alene Lake is the second largest lake in Idaho and is located in the panhandle section of northern Idaho. Population centers are located in the Northern most shoreline of Coeur d'Alene Lake (Coeur d'Alene) and at the mouth of the Coeur d'Alene River (Harrison). The lake is located in two Idaho counties: Kootenai and Benewah. The city of Coeur d'Alene is the largest in Kootenai County and Harrison is the second largest in Benewah County. The largest town in Benewah County (St. Maries) lies about 19 kilometers upstream of Coeur d'Alene Lake on the St. Joe River.

Coeur d'Alene Lake is within the 17,300 square kilometer Spokane River drainage basin. The lake lies in a naturally dammed river valley with the outflow currently controlled by Post Falls Dam. Post Falls Dam controls the level of the lake from the dam to the town of St. Maries on the St. Joe River. At full pool (lake elevation 648.7 meters) the lake covers 129 square kilometers and at minimum pool level (lake elevation of 646.2 meters) the lake covers 122 square kilometers with a mean depth of 22 meters and a maximum depth of 63.7 meters. The lake is 42 kilometers long and anywhere from 1.6 to 9 kilometers wide. Morphometric data was taken from Woods and Berenbrock (1994).

Many tributaries feed the lake. The two main tributaries of Coeur d'Alene Lake, Coeur d'Alene and St. Joe Rivers, drain the Coeur d'Alene and St. Joe Mountains. These mountains are composed of primarily metasedimentary rocks of the belt group with local intrusions of granitics. Lower elevations are composed primarily of glaciofluvial deposits. The southern end of Coeur d'Alene Lake is made up of four shallow lakes (Hidden, Round, Chatcolet, and Benewah) flooded as a result of construction of Post Falls Dam.

The regional climate is subhumid temperate with cool, wet winters and warm, dry summers. The lake receives about 64.5 centimeters of precipitation annually with more in the higher elevations around the lake (97.2 centimeters Wallace, ID). A distinct precipitation season typically begins in October or November and continues through April or May. Approximately two-thirds of annual precipitation occurs during this period. The average daily maximum temperature in July is 30° C, the average daily minimum in January is –5° C. Moist, Pacific air masses that enter the area in late winter and early spring often generate rain-on-snow events. Geological data was taken from U.S. Department of Agriculture (1984).

Target Tributaries
Four target tributaries, including Alder, Evans, Benewah, and Lake Creeks have been identified and described in previous reports (Lillengreen 1993; Lillengreen, et. al. 1996; Kootenai-Shoshone Soil Conservation District 1991; Krueger 1998). Basin morphometrics were derived from the Tribal GIS database following the definitions of Gardiner (1990), and are given in Table 1.1

Table 1.1 Basin morphometry of the Lake Creek, Benewah Creek, Alder Creek and Evans Creek watersheds.

Characteristic	Lake Creek	Benewah Creek	Alder Creek	Evans Creek
Basin Area	93 km^2 (23,117 ac.)	152 km^2 (37,447 ac.)	69 km^2 (17,047 ac.)	34 km^2 (8,512 ac)
Basin Length	16.2 km	22.2 km.	20.2 km.	10.4 km.
Basin Relief	938 m	772 m	820 m	999 m
Basin Perimeter	55.2 km	82.3 km	43.2 km	27.8 km
Relief Ratio	0.057	0.034	0.040	0.095
Channel Length*	152.8 km	219.6 km	110.0 km	46.6 km
Drainage Density	1.64 km/km^2	1.44 km/km^2	1.59 km/km^2	1.37 km/km^2

*Includes intermittent tributaries.

2.0 Materials and Methods

2.1 Lake Studies

2.1.1 Water Quality
Coeur d'Alene Lake is a multi-basin lake with variable water quality conditions. Lake level fluctuations and water retention times in the various sub-basins cause water quality to change during the course of the year and from year to year. This compounds the problem associated with development of a lake wide management strategy because an observed problem may not be recognized in successive years. An appropriate monitoring strategy must account for these fluctuations. The Coeur d'Alene Lake Management Plan (1994) attempted to address this issue by dividing the lake into four water quality management zones. These zones include, nearshore (water depths less than 20 feet), shallow southern lake (Coeur d'Alene Lake south of the confluence with the Coeur d'Alene River), lower rivers (Coeur d'Alene and St. Joe Rivers affected by back water from Coeur d'Alene Lake), and deep open water (north of the mouth of the Coeur d'Alene River).

Coeur d'Alene Tribe Fish, Water, and Wildlife Program staff monitored stations in the southern section of Coeur d'Alene Lake from Rockford Bay south to the St. Joe River. Selection of sample stations was based on geomorphology, visual habitat characteristics, and the potential for changing water quality conditions during the course of the year. Thirteen sample stations were selected to encompass all four water quality management zones identified in the Coeur d'Alene Lake Management Plan (Figure 2.1). These sites, however, do not include a majority of the deep open water zone, which is a major factor in controlling the water quality of the outflow leaving Coeur d'Alene Lake.

The sample stations can be categorized into five very distinct habitat areas. The first distinct habitat area is comprised of two shallow water stations created entirely by inundation from Post Falls Dam. This

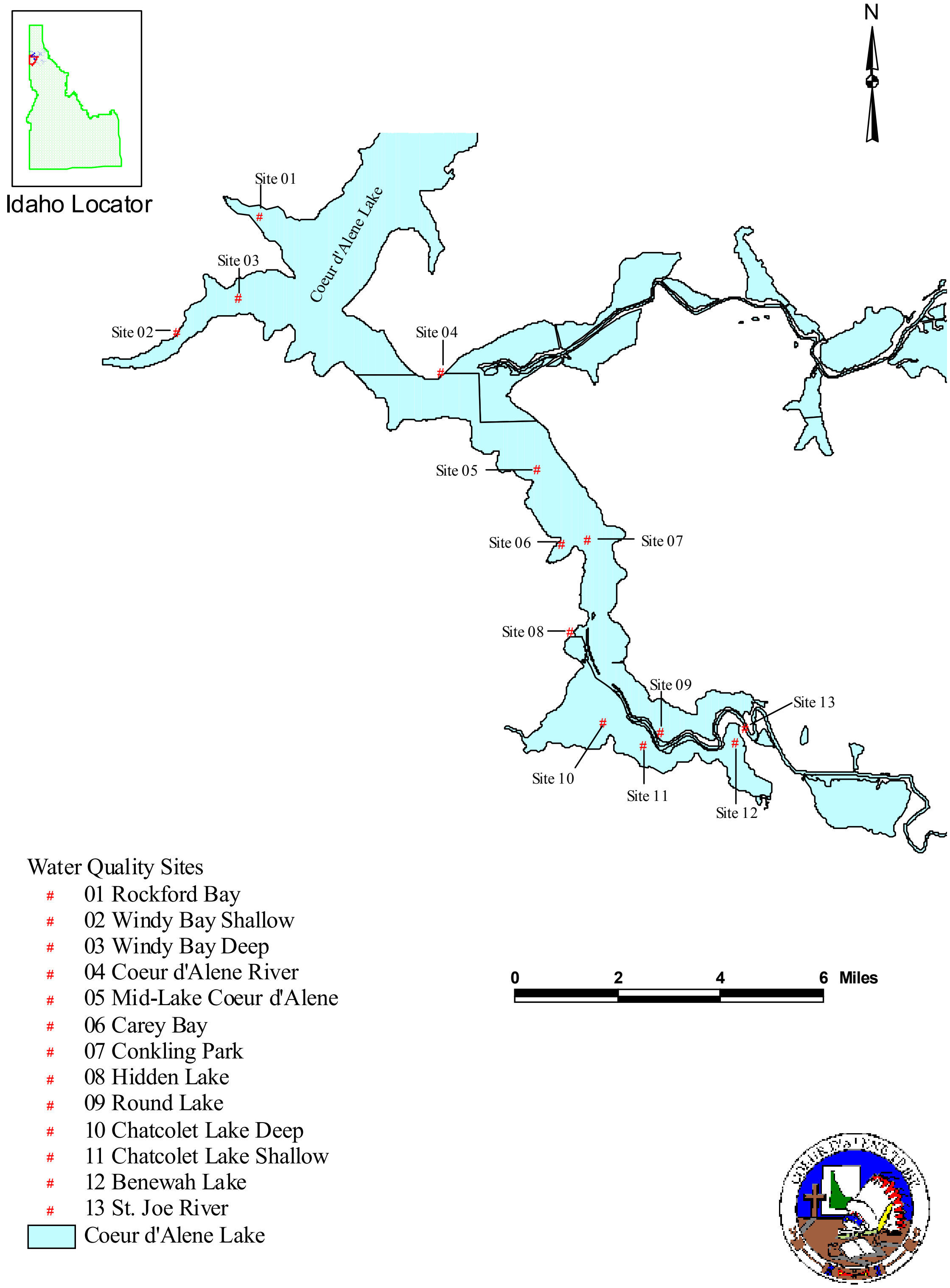


Figure 2.1 Water quality sample sites on Coeur d'Alene Lake.

area is dry during the drawdown period and wetted at full pool. The second habitat area is comprised of the three shallow southern chain lakes of the St. Joe River. These lakes were separated from the Coeur d'Alene Lake system until the completion of Post Falls Dam. The third area consists of three deep, open water sections in the southern part of Coeur d'Alene Lake. These areas are considered pelagic in nature. The fourth habitat area consists of three shallow bays located in the main part of Coeur d'Alene Lake. The fifth area is riverine habitat inundated by waters from Post Falls Dam. Monitoring stations have been established in each of the separate locations (Table 2.1).

Table 2.1 Water quality sample stations grouped by habitat area.

Habitat Area	Stations
Shallow Water	Round Lake Chatcolet Lake Shallow
Southern Chain Lakes	Benewah Lake Chatcolet Lake Hidden Lake
Interior Bays	Carey Bay Windy Bay Shallow Rockford Bay
Open Water	Conkling Point Mid Lake Windy Bay Deep
Inundated Rivers	Coeur d' Alene River St. Joe River

Parameters

Physical/Chemical

Temperature, dissolved oxygen, pH, and conductivity were monitored at each station using a Hydrolab H20 multi-probe transmitter. Quality control was maintained through strict adherence to the standard operating procedures outlined in the Hydrolab manual (1991). Instrument calibration took place prior to every use. A calibration log was used to recorded the date and time of calibration, analyst performing calibration, calibration parameters, and other comments. At the end of the sampling run the instrument was checked for drift. All readings were recorded in the calibration log. All standards used for calibration were traceable to NIST or other comparable standards. Reagents used for calibration was accompanied by the following documentation: manufacturer, lot numbers, expiration dates, date opened. A logbook was kept which contains all information related to preparation of reagents and standards. Field measurements were completed by lowering the instrument by cable to the bottom and bringing it back up 1-2 meters at a time pausing to allow the instrument to stabilize then recording the values. This step was repeated until the instrument reached the surface.

A Secchi disk (20 cm diameter) was used to estimate the transparency of water. Transparency measured in this way is the mean of the depth at which the Secchi disk disappears when viewed from the shaded side of the boat and at which it reappears upon raising after it has been lowered beyond visibility. Secchi readings are used to empirically estimate euphotic zone depth; the depth at which 99% of the surface radiation has dissipated. Secchi disk readings only represent a portion of the total euphotic zone depth that is more rigorously defined by a submersible photometer. The euphotic zone can also be defined as the depth at which gross photosynthesis exceeds respiration. The relationship between euphotic zone depth and secchi disk readings varies from lake to lake depending on factors which influencing euphotic zone depth. However, a general equation (EZD= 2.2302 + 1.4914(SD) r^2 = .78), which we use, has been developed by the FRED division of Alaska Department of Fish and Game (1987). Secchi disk readings are taken at all sites during the sampling run.

Water samples submitted for laboratory analysis were collected using a certified water collection devise and transferred to the appropriate containers for transportation to the contract laboratory. All samples were handled according to Standard methods for the examination of water and wastewater, 18th Ed. (APHA), 1992, procedure 1060: Collection and preservation of samples. Strict chain of custody procedures as outlined in section 1060.B.1: Chain of custody procedures (APHA) was followed. All containers used were specially cleaned and prepared by the contract laboratory.

Total Suspended Solids was analyzed using EPA method 160.2: Gravimetric determination of Total Suspended Solids. TSS is defined as the residue left on a filter paper of 2μm or smaller after a portion of sample has been filtered through (APHA, 1992). A qualified analytical laboratory completed turbidity analysis in accordance with (APHA, 1992) standard method 2130B: Nephelmetric determination of turbidity and/or EPA method 180.1. Turbidity is an expression of the optical property that causes light to be scattered and absorbed rather than transmitted in straight lines (APHA, 1992). Turbidity in water is caused by suspended matter including clay, silt, and finely divided organic and inorganic matter. The clarity of a natural body of water is a major determinant of the condition and productivity of that system (APHA, 1992).

All metals samples were handled as described previously for collection of water for laboratory analysis. Metals samples were preserved by acidification to 2% HNO_3 as soon as possible after collection. Metals samples were analyzed using EPA method 200.7/200.8 Inductively Coupled Plasma scan by a qualified contract analytical laboratory. The following trace elements were analyzed: zinc, silica, antimony, barium, beryllium, magnesium, arsenic, sodium, aluminum, calcium, copper, silver, lead, cadmium, cobalt, nickel, manganese, iron, chromium.

Nutrients

Nutrient samples were collected in the same manner as turbidity and metals. Nutrient sampling consisted of a euphotic zone composite sample determined by secchi disk and temperature analysis, and a hypolimnetic composite sample with the upper portion of the stratum determined by the temperature profile. Composite sampling was in accordance with APHA method 1060.A.3.B: Composite sample collection. All samples were handled according to Standard methods for the examination of water and wastewater 18th Ed. (APHA) 1992 procedure 1060 collection and preservation of samples. The contract laboratory analyzed nutrient samples with an ion chromatograph using EPA method 300.0. The following ions were tested for: ortho-phosphate, nitrate, and nitrite. Other ions looked at were fluoride, chloride, and sulfate.

Primary Productivity

Chlorophyll$_a$ samples were collected in amber colored bottles and placed directly on ice. Samples were collected at the same locations as nutrients. A contract laboratory completed sample analysis. The method used was Standard methods for the examination of water and wastewater 18th Ed. (APHA) 1992 procedure 10200 parts 1: pigment extraction and 2: spectrophotometric determination of chlorophyll.

Sample Timing

The sampling schedule was designed to capture data related to significant changes in the water quality throughout the year. This included physical/chemical characteristics, nutrient characteristics, and phytoplankton and macrophyte growth. Sampling was initiated just prior to the onset of the growing season in the spring and continued until the lake turned over in the fall, marking the end of the growing season. Limited sampling was completed after fall turnover because weather usually prohibited any extensive sampling. During this time, however, very little natural change is occurring. A representative sample was taken during the winter and applied to the rest of the winter season.

Sampling Schedule
Physical/ Chemical sampling
Sampling was scheduled to begin the last week in February, however, foul weather postponed the start until mid-March. Only one sample was taken between November and February when the lake was isothermal. Ice formed on the surface of the lake within the study area thus, inhibiting sampling during that time frame. The following parameters were monitored at all sites on a bi-weekly basis: temperature, pH, dissolved oxygen, and conductivity. Turbidity was monitored at all sites on a monthly basis. Trace heavy metals were monitored at only three sites on a monthly basis. Surface to bottom depth profiles were taken for temperature, pH, dissolved oxygen, and conductivity. Composite samples were taken in the euphotic zone and the hypolimnion for turbidity and trace heavy metals.

Nutrient Sampling
Five nutrient samples were taken at all sites on a monthly basis from July to November. The following parameters were monitored: Phosphate, Nitrate, Nitrite, Sulfate, Chloride, and Fluoride. Composite samples were taken in the euphotic zone and the hypolimnion.

Phytoplankton (primary productivity)
$Chlorophyll_a$ samples were taken at the same time and frequency as the nutrients. Composite samples were taken in the euphotic zone and the hypolimnion.

2.1.2 Fisheries

Fish abundance surveys were conducted on a monthly basis from July through October 1997 on Coeur d'Alene Lake. The section of Coeur d'Alene Lake sampled extended from Windy Bay south and was divided into 12 different transect areas (Figure 2.2) along a longitudinal axis in an attempt to decrease overall sampling bias. Each transect area contained 2-4 sample reaches. The reach locations were determined by visual habitat characteristics and transect size. These reaches were chosen in order to best represent the shoreline habitat within the transect area. The collective submerged habitat within all reaches spans the ranges of conditions within each transect area.

Fish were collected using horizontal gillnets and electrofishing. Three twisted nylon strand horizontal nets: 12X200, 10X200, and 8X200 feet each with 4 panels of 1-4 inches stretched mesh were set in the deep open water or pelagic zones within each transect area. Nets were used only in locations not susceptible to electrofishing sampling techniques, following the methods described by Huber (1983). One net would be set in the transect area and it would be fished for approximately 12 hours after which it would be pulled and the fish would be removed. Once the net was cleared it would be reset in the same place and fished another 12 hours. This was completed one time each month from July to October.

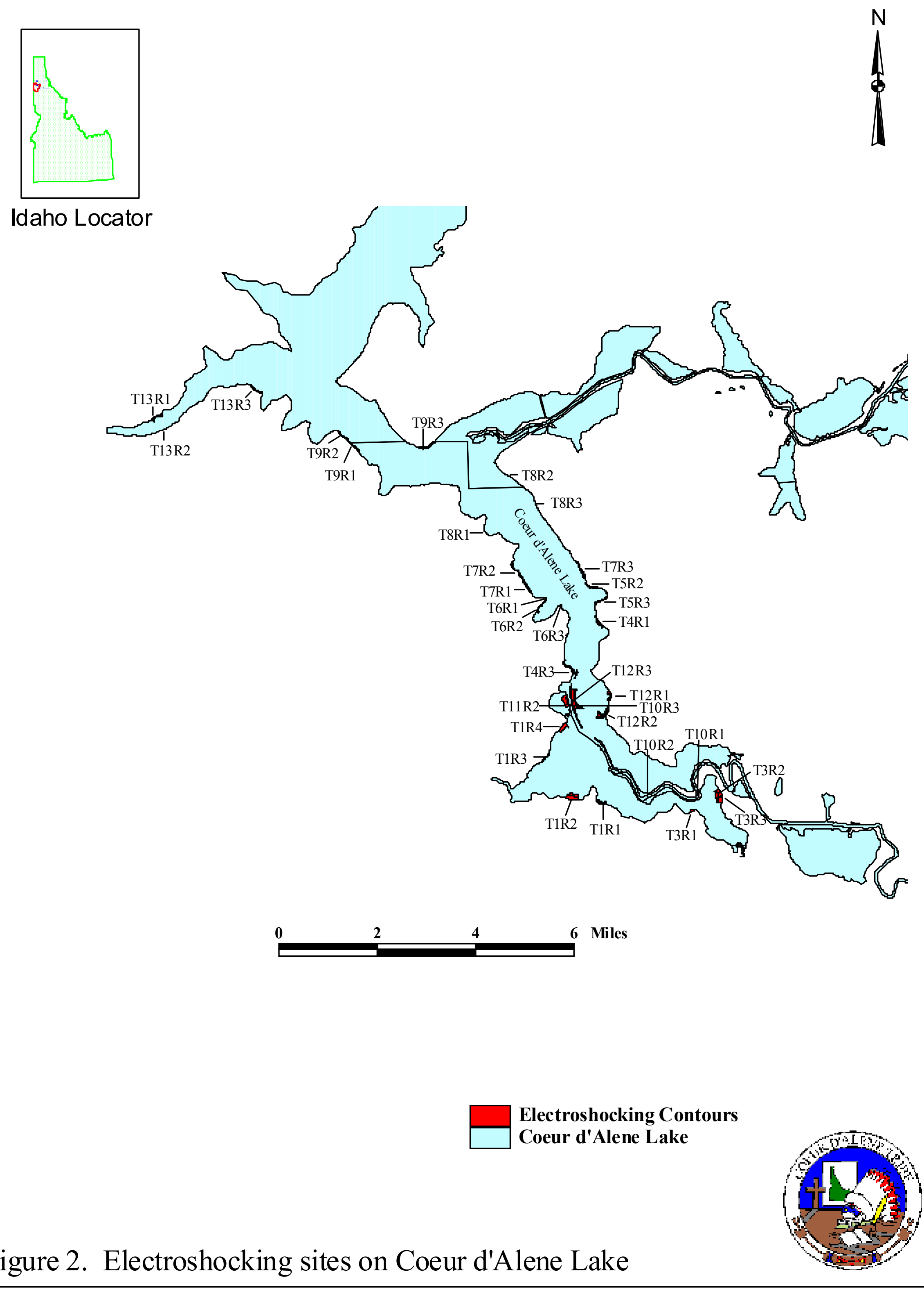


Figure 2. Electroshocking sites on Coeur d'Alene Lake

A custom made aluminum boat equipped with a Smith-Root 7.5 GPP electrofishing unit was used to sample the near-shore or littoral areas within the designated reaches according to methods adapted from Reynolds (1983) and Novoteny and Priegle (1974). The voltage of the electrofishing unit was adjusted to produce a current between 5.0 and 8.0 Amps. A current of 5.0-8.0 seemed to produce the best results in the low conductivity waters (35 µmhos- 80 µmhos) of Coeur d'Alene Lake. Each reach was sampled two times per month; once during the daylight hours and once during the nighttime hours. Netters were to net all sizes and species of fish with equal effort in an attempt to limit the amount of sampling bias introduced into the final data set. Duration of the sampling effort varied from 5-10 minutes. Work completed by Miranda, *et al.* (1996) demonstrated that variations in the duration of the sampling period did not affect overall catch per unit effort. They showed that in areas where densities are high shorter sampling times gives equal results when compared to longer sampling times.

Relative abundance is an index of population density that assumes that catch per unit effort (CPUE) is proportional to stock density. However, several physical and behavioral characteristics of each species of interest govern both distribution and susceptibility to sampling techniques used. Thus, large fluctuations in CPUE can occur which will hamper interpretation of the CPUE data. In order to use CPUE, special attention must be given to reducing variability by standardizing gear, methods and sampling design. Relative abundance was determined by calculating the percentage of the total catch for each species for a given sample period and sample area. CPUE was calculated by dividing the number of fish captured for each individual species by the total sample time.

The capture location and total length (mm) was recorded for all fish sampled. All game fish were weighed and scaled for age determination. Age determinations were completed using methods described by Jearld (1983). For yellow perch, scales were collected only from the first 20 fish captured in a single sampling run. All adult cutthroat trout, rainbow trout, largemouth bass, northern pike, and channel catfish were tagged with a numbered floy tag and released. Weight (grams) was recorded only for the first 20 fish of each non-game species collected in a single sampling run.

A habitat based model developed by Hickman and Raleigh (1982) was used to evaluate the suitability of lacustrine habitat types for cutthroat trout. The lacustrine model consists of two components: water quality and reproduction. The water quality component takes three variables into consideration, including temperature, dissolved oxygen and pH. Water quality data collected in 1997 were used to calculate the individual suitability index (SI) values using published curves. The reproduction component was not examined in this report.

2.2 Stream Studies

2.2.1 Water Quality

Water quality monitoring was conducted on 13 streams in 1997 (Table 2.2). Each stream was sampled for the same parameters as described above for lake studies, except chlorophyll$_a$. Metals analyses were only completed at the two Fighting Creek sample sites. Additional monitoring parameters are described below.

A stage/discharge relationship was developed for each stream based on a linear regression of staff gauge height vs. stream discharge. The rating curve was used to determine the annual water budget for each stream sampled. Staff gauge heights were recorded to the nearest 0.002 of a foot. Discharge measurements were taken at low, medium, and high flows in order to complete the rating curve. Discharge measurements were taken in accordance with standard IFIM methodologies (Bovee and Milhouse et. al., 1984). The wetted stream channel was divided into 20 equal cells and water velocity was measured in each cell using a Price model 622 digital flow meter. Discharge for each cell was calculated by multiplying the cell width by depth and velocity. All individual cell discharges were summed to determine total discharge in cubic feet per second. Channel profiles were measured to evaluate changing flow dynamics over time.

Table 2.2 Stream water quality sites and monitoring parameters.

Location	Discharge	Temperature	DO	pH	Conductivity	Turbidity	TSS	Metals	Nutrients
Lower Plummer Creek	X	X	X	X	X	X	X		X
Lower Lake Creek	X	X	X	X	X	X	X		X
Upper Lake Creek	X	X	X	X	X	X	X		X
Lower Fighting Creek	X	X	X	X	X	X	X	X	X
Upper Fighting Creek	X	X	X	X	X	X	X	X	X
Evans Creek	X	X	X	X	X	X	X		X
Benewah Creek[a]	X	X	X	X	X	X	X		X
Windfall Creek	X	X	X	X	X	X	X		X
School House Creek	X	X	X	X	X	X	X		X
West Fork Benewah Creek	X	X	X	X	X	X	X		X
Alder Creek	X	X	X	X	X	X	X		X
Hangman Creek	X	X	X	X	X	X	X		X
Little Hangman Creek	X	X	X	X	X	X	X		X
Indian Creek	X	X	X	X	X	X	X		X

[a] Benewah Creek had three sampling stations, Three Mile, Nine Mile and Upper Benewah.

2.2.2 Habitat Suitability Index Model

A modified habitat suitability index (HSI) model was used to evaluate the effect of water quality parameters on cutthroat trout populations within and among the target watersheds. A HSI was calculated for the water quality subcomponent of the model described by Hickman and Raleigh (1982). Model variables included: average maximum water temperature (V_1); average minimum dissolved oxygen (V_3); annual maximal or minimal pH (V_{13}); and average annual base flow as a percentage of the average annual daily flow (V_{14}). Individual suitability index (SI) values were calculated for each variable using curves published in Hickman and Raleigh (1982). The following equation was used to calculate the final HSI score:

$$C_{OQ} = (V_1 x V_3 x V_{13} x V_{14})^{1/4}$$

Where; C_{OQ} = HSI for water quality component, and

V_n = suitability index for water quality parameters.

Water quality data collected in 1997 and in 1998, when available, were used as input variables. The following modifications were made to address site specific conditions: a seven-day running average of maximum temperature was used; and average minimum dissolved oxygen was calculated for the period of greatest average water temperatures. Continuous discharge measurements were only available for the two sample sites on Lake Creek. For the remaining sites, average annual daily flow was calculated based on a minimum of 12 discharge measurements taken during the year, and average annual base flow was calculated for the period of low flow which corresponded to the greatest average water temperatures.

The final HSI was calculated using both a compensatory and a non-compensatory method. The compensatory method assumes that moderately degraded water quality conditions can be partially compensated for by good physical habitat conditions. The non-compensatory method assumes that degraded water quality conditions cannot be compensated for, and variables with suitability indices (SI) < 0.4 become limiting factors on habitat suitability. For purposes of interpretation, HSI with values ranging from 0 - 0.25 were considered very poor; 0.25 – 0.4 were poor; 0.4 – 0.6 were good; and 0.6 – 1.0 were very good.

2.2.3 Fisheries

Sample Site Selection

The channel types delineated during previous surveys (Lillengreen, 1996) served as the basic geomorphic units for selecting sample sites for conducting fish population surveys. In these early channel type surveys, stream reaches were classified into relatively homogeneous types according to broad geomorphologic characteristics of stream morphology as defined by Rosgen (1994). Sample sites within each reach were selected to include habitat types representative of the reach as a whole (Figures 2.3 – 2.6). The length of each sample unit was defined as twenty times the average stream width, with a minimum sample distance of 100 meters. Longer stream reaches were sampled more intensively than shorter reaches. Sample sites were also selected in each of the tributaries known to have spawning activity, regardless of whether channel type surveys had been completed. In these cases, sample sites were distributed evenly at approximately 1,500 meter intervals.

Sites were sampled in the summer to quantify the abundance and distribution of fishes during base flow conditions (July 30 – August 22, 1996 and June 6 – July 11, 1997). An additional sampling effort in the fall (September 11 – October 28, 1996 and August 11 – September 11, 1997) attempted to capture young of the year fish that had been missed during the summer sampling period and to document fish migration in response to changing water quality conditions.

Population Estimates

Trout populations were estimated in 1996 and 1997 using the removal-depletion method (Seber and LeCren 1967, Zippen 1958). Blocknets were placed at the upstream and downstream boundaries to prevent immigration and emigration. Each sample site was electrofished using the standard guidelines and procedures described by Reynolds (1983). Fish were collected by spot shocking using a Smith-Root Type VII pulsed-DC backpack electrofisher. Two electrofishing passes were made for each sample site. Salmonid species, including cutthroat trout, brook trout, and bull trout, were the target species for this study. Captured fish were identified, enumerated, measured (TL to nearest mm), and weighed. Cutthroat trout greater than 200 mm in length were tagged with a Floy FD-6B numbered anchor tag. Other species such as longnose dace, redside shiner, longnose sucker, and sculpin (sp.) were considered incidental catch and were only counted.

Population estimates were calculated using the following equation (Armour et. al. 1983):

$$N = \frac{U_1}{1-(U_2 / U_1)}$$

Where:

N = estimated population size;

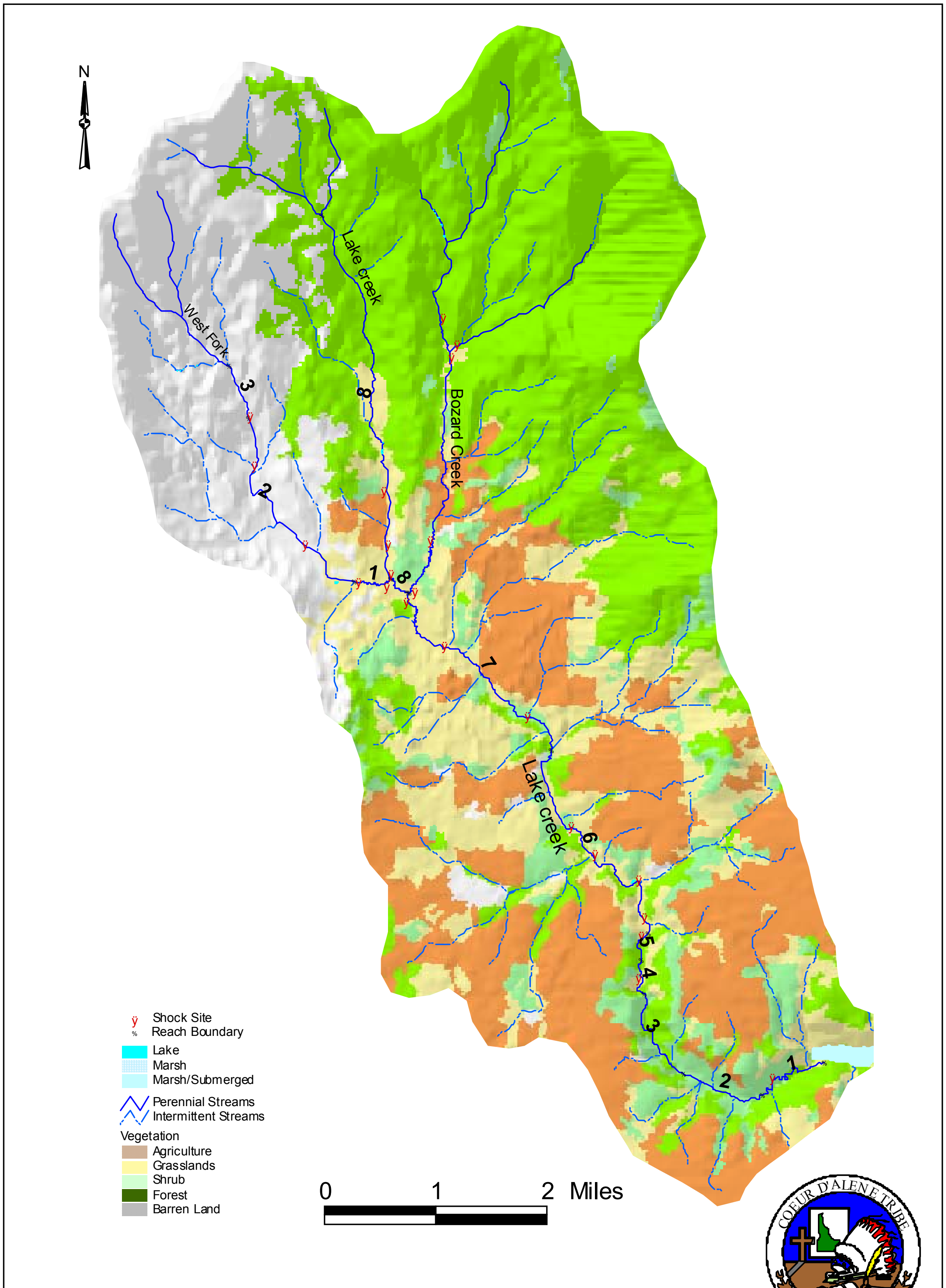


Figure 2.3 Lake Creek shock site locations.

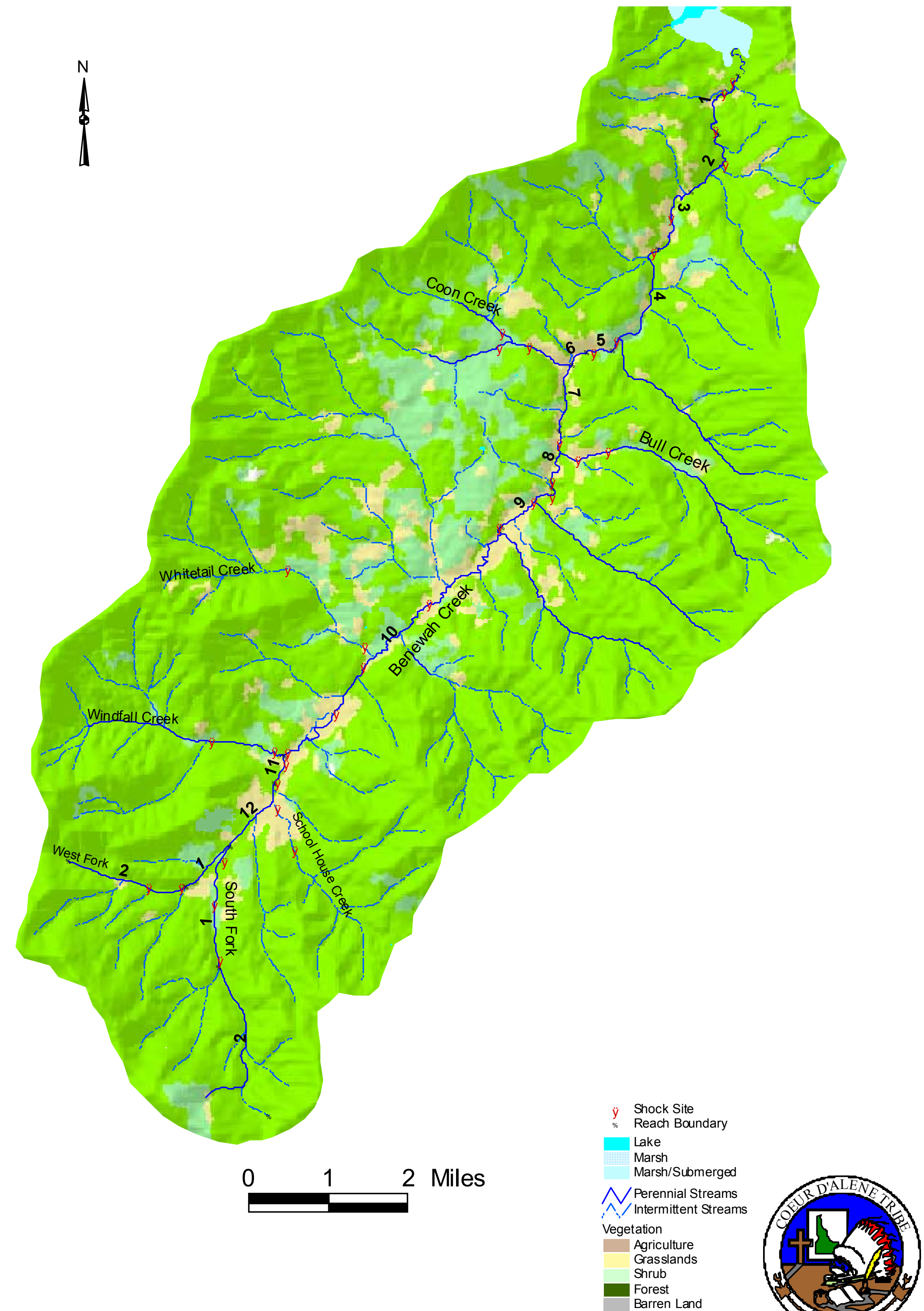


Figure 2.4 Benewah Creek shock site locations.

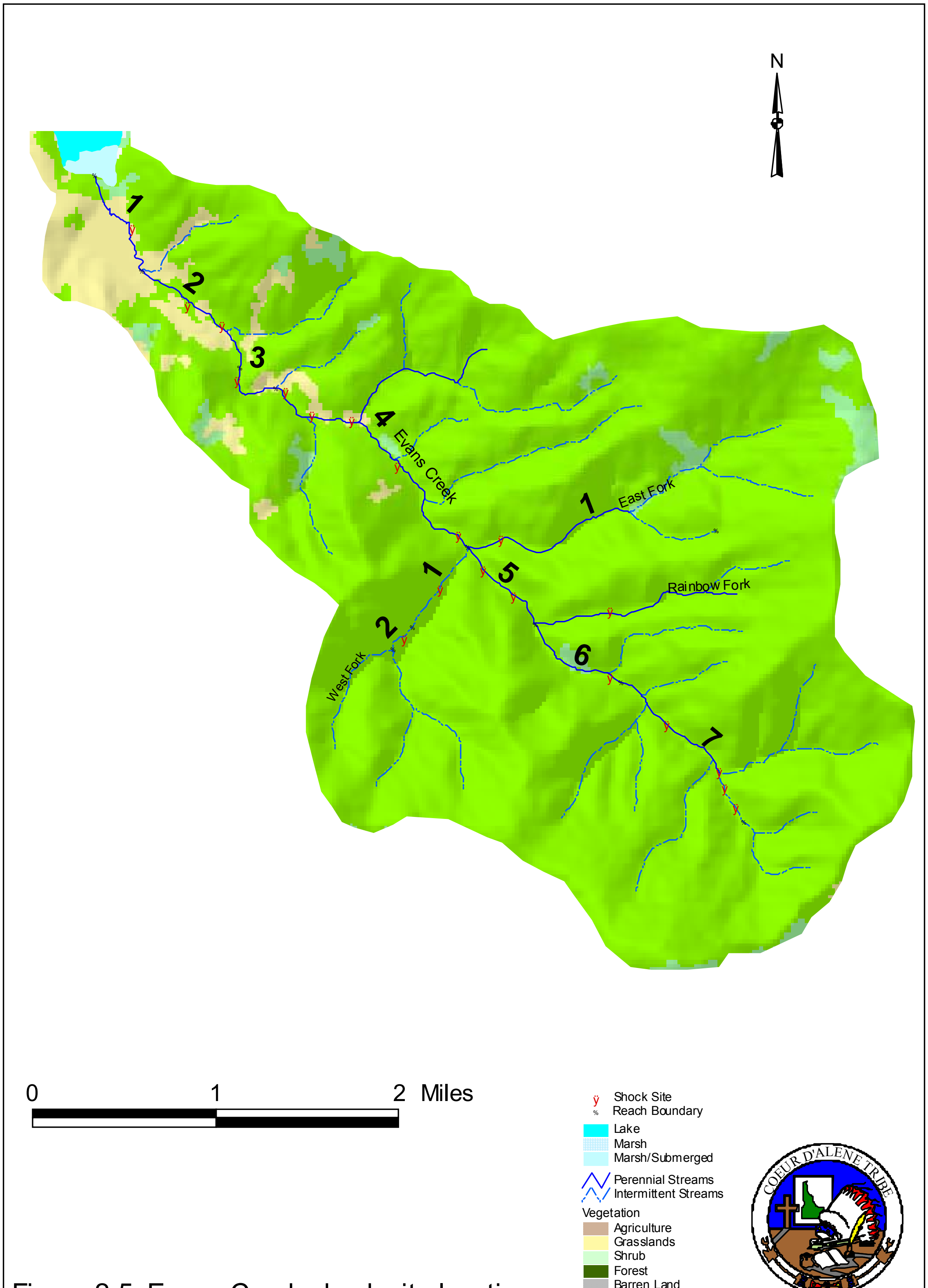


Figure 2.5 Evans Creek shock site locations.

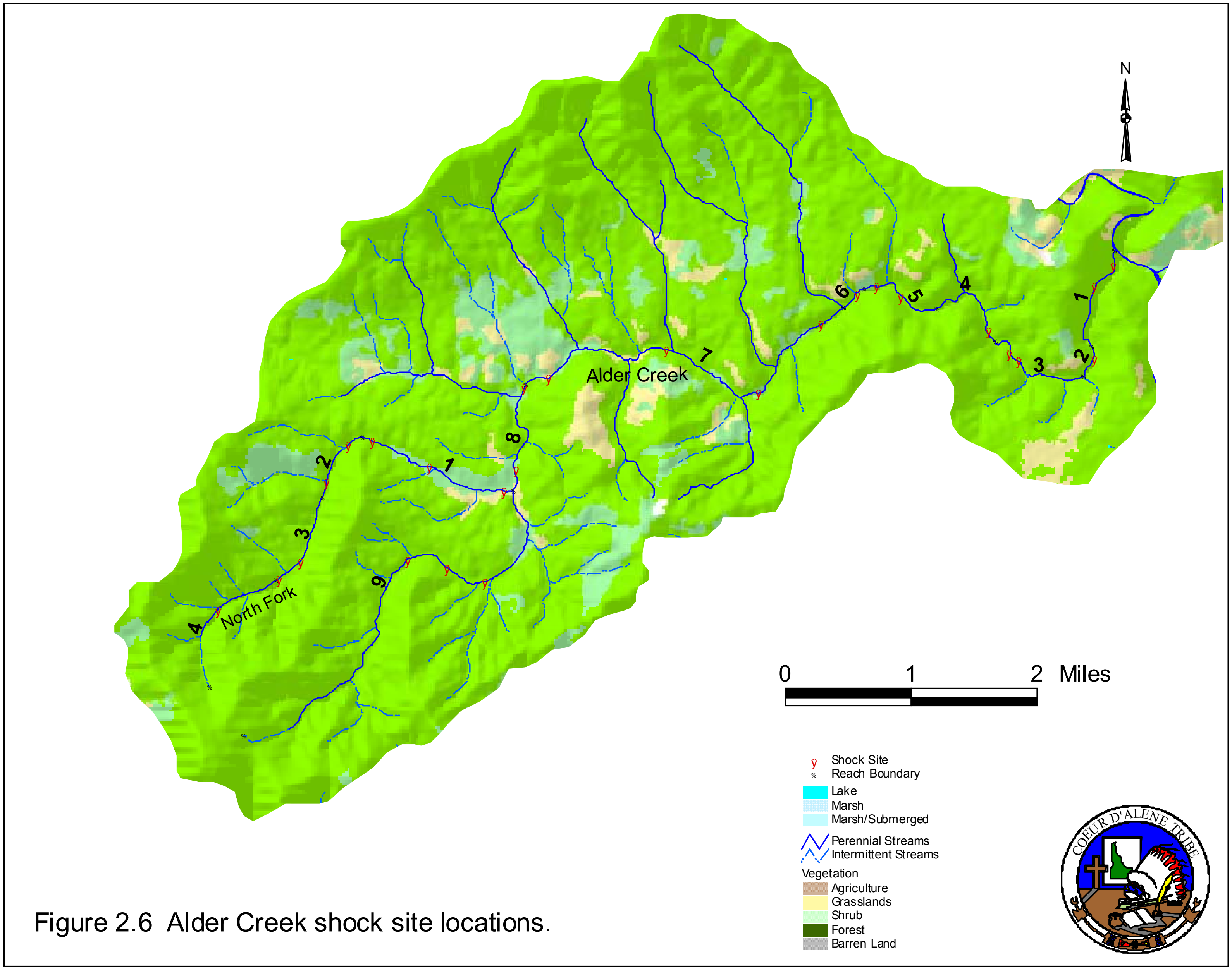


Figure 2.6 Alder Creek shock site locations.

U_1= number of fish collected in the first pass; and
U_2= number of fish collected in the second pass.

The standard error of the estimate was calculated as:

$$se(N) = \sqrt{\frac{M(1 - M / N)}{A - \left[(2p)^2 (U_2 / U_1)\right]}}$$

where:
se(N) = standard error of the population estimate;
M= $U_1 + U_{2;}$
A= $(M/N)^2$; and
p= $1 - \frac{U_2}{U_1}$.

The population estimates were converted into density values (# fish/100 meters) for each sample site then extrapolated to the reach in which the samples were collected. The confidence intervals were converted in the same manner.

Age and Growth

Raw scales were used for age determination and calculating growth rates. Salmonid scales were taken from the side of the body just behind the dorsal fin and above the lateral line (Jearld 1983). Scales samples were sorted by watershed to allow for independent determination of age and growth rate. In the laboratory, several dried scales were mounted between two glass microscope slides and viewed using a Realist, Inc., Vantage 5 microfiche reader. Age was determined by counting the number of annuli (Lux 1971, Jearld 1983). Simultaneous to age determination, a measurement was made from the center of the focus to the furthest edge of the scale. Along this line, measurements were made to each annulus under a constant magnification. Annual growth was then back calculated using the Lee method as described by Carlander (1981). The formula used:

$$L_i = a + \left(\frac{L_c - a}{S_c}\right) S_i$$

where:
Li = Length of fish (in mm) at each annulus;
a = intercept of the body scale regression line;
Lc = length of fish (in mm) at time of capture;
Sc = distance (in mm) from the focus to the edge of the scale; and
Si = scale measurement to each annulus.

The intercept (a) was obtained from the linear regression of body length versus scale length at time of capture. The proportional method of back-calculation was used for species with small sample sizes due to poor regression results. The following equation was used:

$$L_i = \left(\frac{S_i}{S_c}\right) L_c$$

This formula does not take into account the size of fish at scale formation as does the Lee method.

A linear regression of body length versus age was calculated independently for fish from each subject watershed and the resulting equation was used to determine the age of fish for which scale samples were not taken.

Trout Migration

Migration traps were installed in Lake Creek, Benewah Creek, Evans Creek, and Alder Creek to assess migratory patterns, reproductive cycles, distribution, and relative abundance. Traps were functional from March 24 – June 8, 1996 and March 6 – June 5, 1997, except during periods of high stream flow. The traps consisted of a weir, runway and a holding box. The design was a modification of the juvenile downstream trap found in Conlin and Tuty (1979). Traps were installed in pairs at some locations to allow monitoring of both upstream and downstream movements of fish (Table 2.3). Paired traps were placed approximately 20 meters apart.

Traps were checked at least once daily during peak spawning periods from mid-March through the middle of May and once daily afterwards until late June, when traps were removed. Fished captured in the traps were identified, counted, measured, and weighed. A scale sample was taken to assess the age, growth, and condition of the fish. Trap efficiency was calculated to allow for comparisons among years and was determined as catch per unit effort (CPUE), where one unit effort was defined as one 24 hour period.

Table 2.3. Fish trap location in the four target watersheds during 1996-1997.

Lake Creek	Benewah Creek	Alder Creek	Evans Creek
At Hyw 95 crossing (p)	Mouth Benewah (p)	At mouth of creek	At mouth of creek
Upstream of Bozard Creek confluence	Mouth W.F. Benewah		
Mouth Bozard Creek	Mouth S.F. Benewah		
	Mouth Coon Creek		
	Mouth Whitetail Creek		
	Mouth Windfall Creek		

(p) Indicates a paired trap location.

3.0 Results

3.1 Lake Studies

3.1.1 Water Quality

Seven physical/chemical properties of water, two essential nutrients, and 11 dissolved metals were tested for on Coeur d'Alene Lake in 1997. The testing program was directed primarily at the properties of water that most affected fish production and distribution within the lake. The pH of the water in Coeur d'Alene Lake was tested at 13 different sites. Vertical profiles were taken at two-week intervals from April to November. The pH of Coeur d'Alene Lake does not change very much from season to season or on an annual basis. Observed values ranged from 6.8 to 8.0 (Appendix A), all within the optimal tolerance limits for cutthroat production. The only variation occurred at three stations in the southern lakes section (Chatcolet Lake, Benewah Lake, and Hidden Lake) where the pH rose to 9.4 (Figure 3.1) in the upper 2 meters of the water column. The three stations that showed similar changes in pH were in geomorphologically similar areas.

Vertical profiles of the specific conductance were taken concurrently with the other physical/chemical parameters (Appendix A). All conductivity measurements were within the tolerance limits for cutthroat trout production and ranged from 26 μmhos too 82 μmhos. Any variability to the conductivity was due to natural environmental conditions except at the mouth of the Coeur d'Alene River (Figure 3.2) where higher than normal levels of dissolved metals are flowing into the lake. Values remained very stable during the fall, winter, and spring months. Only during the peak summer conditions did variation occur.

Vertical profiles of dissolved oxygen were taken at each of the thirteen stations (Appendix A). Dissolved oxygen, when at low concentrations is an indication of high levels of organic decomposition. The surface water of every sampling station remained at acceptable levels (>6.0 mg/L) over the course of the entire year. However, four of the thirteen sampling stations showed D.O. concentrations of less than 6.0 mg/L (Table 3.1). Three of the stations, which violated the dissolved oxygen standard, were located in geomorphologically similar areas (Benewah Lake, Chatcolet Lake, and Hidden Lake) the fourth was located in the mid-lake sampling station. The drop in D.O. is most likely related to the decomposition of large quantities of aquatic macrophytes growing in these areas.

Table 3.1 Sample stations on Coeur d' Alene Lake that had a dissolved oxygen reading less than 6.0 mg/L.

Location	Depth (m)	Dissolved Oxygen (mg/L)
Mid Lake	13	4.5
Hidden Lake	7	0.25
Chatcolet Lake	9	0.50
Benewah Lake	4.5	1.25

The lowest dissolved oxygen concentrations were located in Hidden Lake where a reading of 0.25 mg/L was recorded in the lowest one meter of the lake. Dissolved oxygen concentrations in Hidden Lake were in violation of the 6.0 mg/L standard in the lowest 2.5 meters of the water column. Chatcolet Lake had the second lowest reading (0.50 mg/L) and was in violation of the 6.0 mg/L standard in the lowest 6 meters of the water column. Benewah Lake was also in violation of the 6.0 mg/L standard in the bottom 1 meter with a low of 1.25 mg/l reading. The only station found in violation of the 6.0 mg/L standard within the main Coeur d'Alene Lake was the mid-lake station where the 6.0 mg/L standard was violated in the bottom 1 meter with a reading of 4.5 mg/L. This drop in DO levels is a general indicator of increasing trophic status or eutrophication. The general trend was an increase in trophic status in a north to south direction. However, Conkling Point sample station which is between mid-lake and Hidden Lake did not violate the 6.0 mg/L dissolved oxygen standard.

Vertical profiles of temperature were taken at all thirteen stations during the course of the year (Appendix A). Geomorphologically similar stations showed similarities in the temperature profiles in both timing of stratification and magnitude of the warming. Shallow stations heated up sooner than deeper water stations. The shallow southern lakes had more variability in the timing and magnitude of

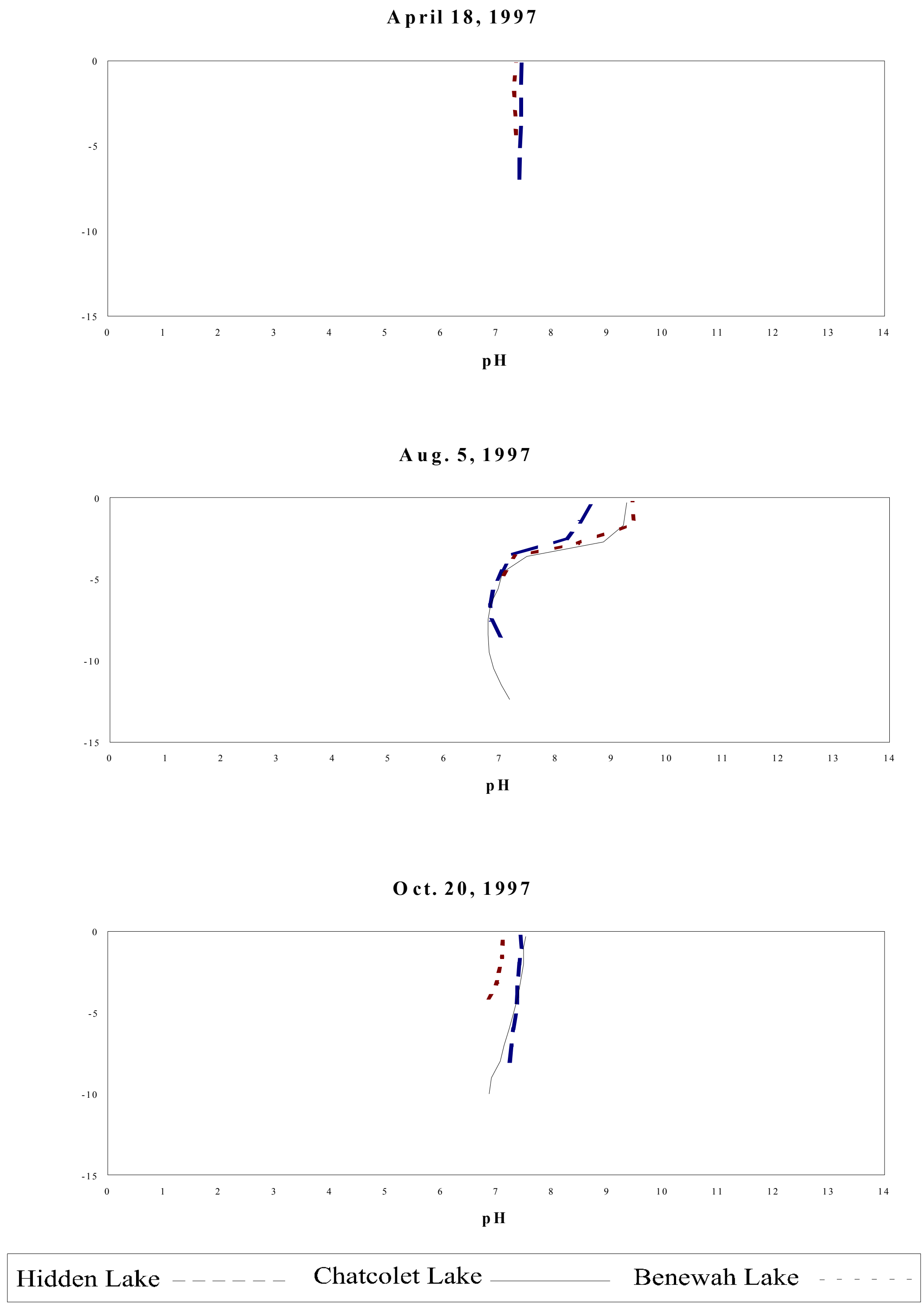


Figure 3.1 Peak spring, summer and fall pH profiles for three geomorphologically similar sampling locations on Coeur d'Alene Lake during 1997.

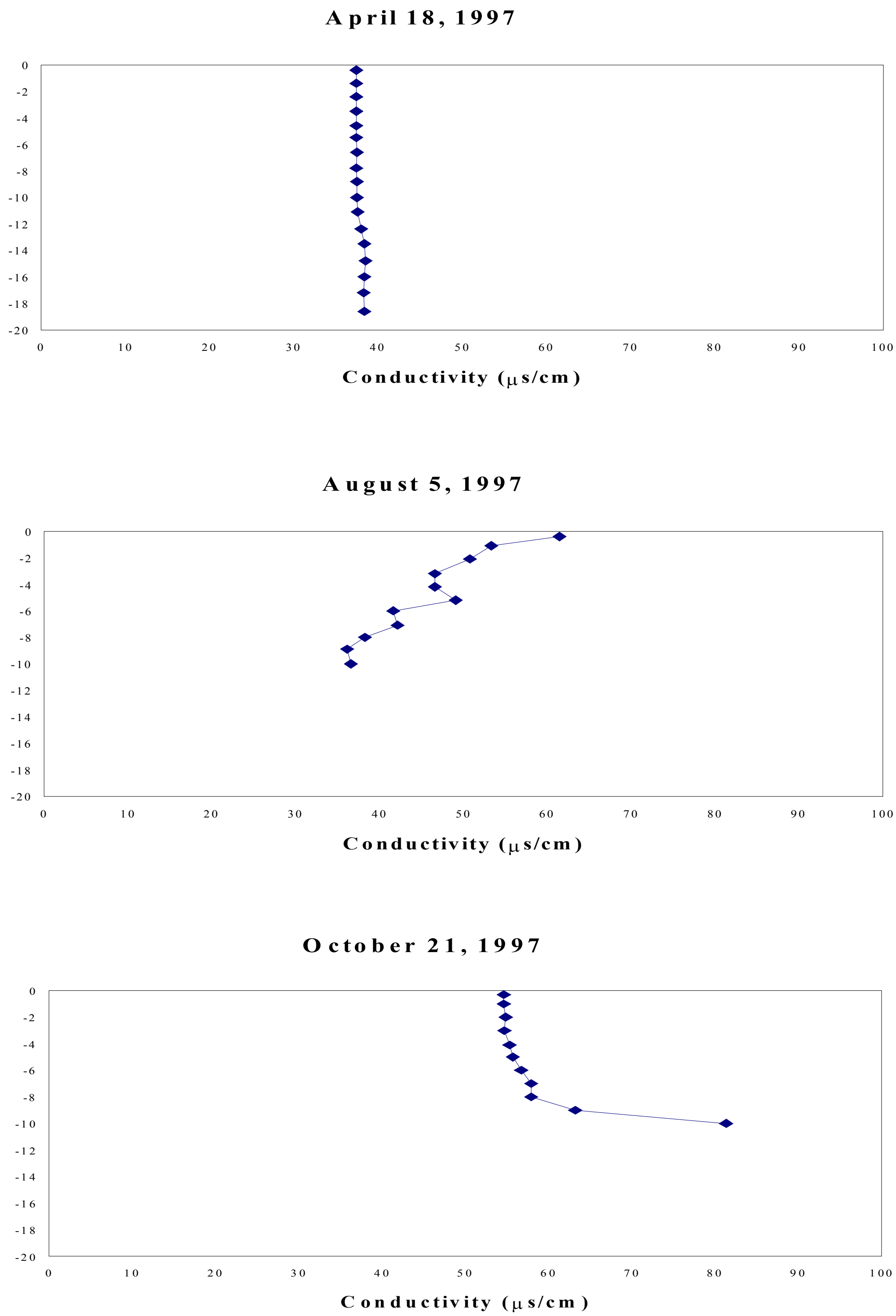


Figure 3.2 Peak spring, summer and fall conductivity profiles for the Coeur d'Alene River during 1997.

the change. All stations were isothermal (5.5°C) on the April 18th sample date with formation of a thermocline by May 16th.

In the shallowest stations (Round lake and Chatcolet Shallow), 1.5m deep or less, the epilimnion extended to the bottom before May 16th (Figure 3.3). In the shallow southern lake stations (Chatcolet Lake, Benewah Lake, and Hidden Lake) the thermocline was present by May 16th and reached its deepest point on September 17th however, by September 29th the stations were isothermal and the lakes had turned over (Figure 3.4). At turnover the isothermal temperature was 15.5° C.

Vertical profiles for the interior bay stations (Windy Bay Shallow, Rockford bay, and Carry Bay) showed that the thermocline had started to build in by May 16th and the water nearest to the bottom had warmed from 5.5° C to 7.0° C (Figure 3.5). By June 26th the thermocline had reached the bottom. By September 17th all of the interior bay sample stations were isothermal at 15.5° C.

Temperature profiles for the deep-water stations (Conkling Point, Windy Bay Deep, Mid-Lake) showed a definite thermocline by May 16th (Figure 3.6) with complete thermal stratification by August 5th. The thermocline was still present in the deepest sampling station on October 22nd, however, it was nearly broken down in the other two deep water stations. By November 4th the deep water stations were isothermal but had only cooled to about 10.5° C while the interior bay sample stations had cooled to 10.0° C and the 3 shallow southern lakes sample stations and 2 shallow stations had cooled to 7.0° C (Appendix A).

Vertical temperature profiles for the riverine sample stations showed similar timing in the formation of the thermocline (Figures 3.7 and 3.8). The St. Joe sample station did show slightly higher temperatures on the average during the spring. The peak temperatures for the Coeur d'Alene River sample station during the other times of year was slightly higher than the peak temperatures for the St. Joe River.

Optimal temperatures for adult salmonid rearing are around 15.0^0 C. In the shallowest sampling stations temperatures greater than the 15.0^0 C temperature standard existed from July 8th through September 29th from surface to bottom. The temperature peaked at 26.5^0 C on August 8th. In the shallow southern lakes sampling stations the 15.00 C temperature criteria was exceeded from August 5th to September 29th surface to bottom however, between June 11th and August 5th the temperature criteria was exceeded and habitat was limited in increasingly larger portions of the water column. The temperature peaked at 26.5^0 C on August 8th. In the interior bays sample stations the temperature criteria was exceeded from September 17th to September 29th surface to bottom however, the temperature criteria was exceeded in increasingly larger portions of the water column between May 29th and September 17th. The temperature peaked on August 5th at 23.5^0 C. In the deep water sampling stations the temperature criteria were never exceed from surface to bottom however, the temperature standard was exceed in a portion of the water column and habitat was limited in that area. The criteria were exceeded between June 11th and September 29th except in the Windy Bay deep station where it was exceeded by May 29th. The depth of 15.0^0 C water increased from June 11th to August 27th then it gradually decreased to September 29th reaching a maximum depth of 13 meters on August 27th.

Total suspended solids were fairly uniform throughout the epilimnion of the lake (Table 3.2) with only a few differences found. The shallow stations ran slightly higher than the other stations with Round Lake reaching a high of 16.0 mg/l. The southern lakes also ran slightly higher with Hidden Lake and Benewah Lake reaching a high of 10 mg/l. The hypolimnion was quite variable throughout the lake (Table 3.3). The Windy Bay deep reached a high of 27.0 mg/l. Drinking water standards are set a 500 mg/l however, levels much lower can impart a foul taste to the water. No analysis of the composition of the suspended

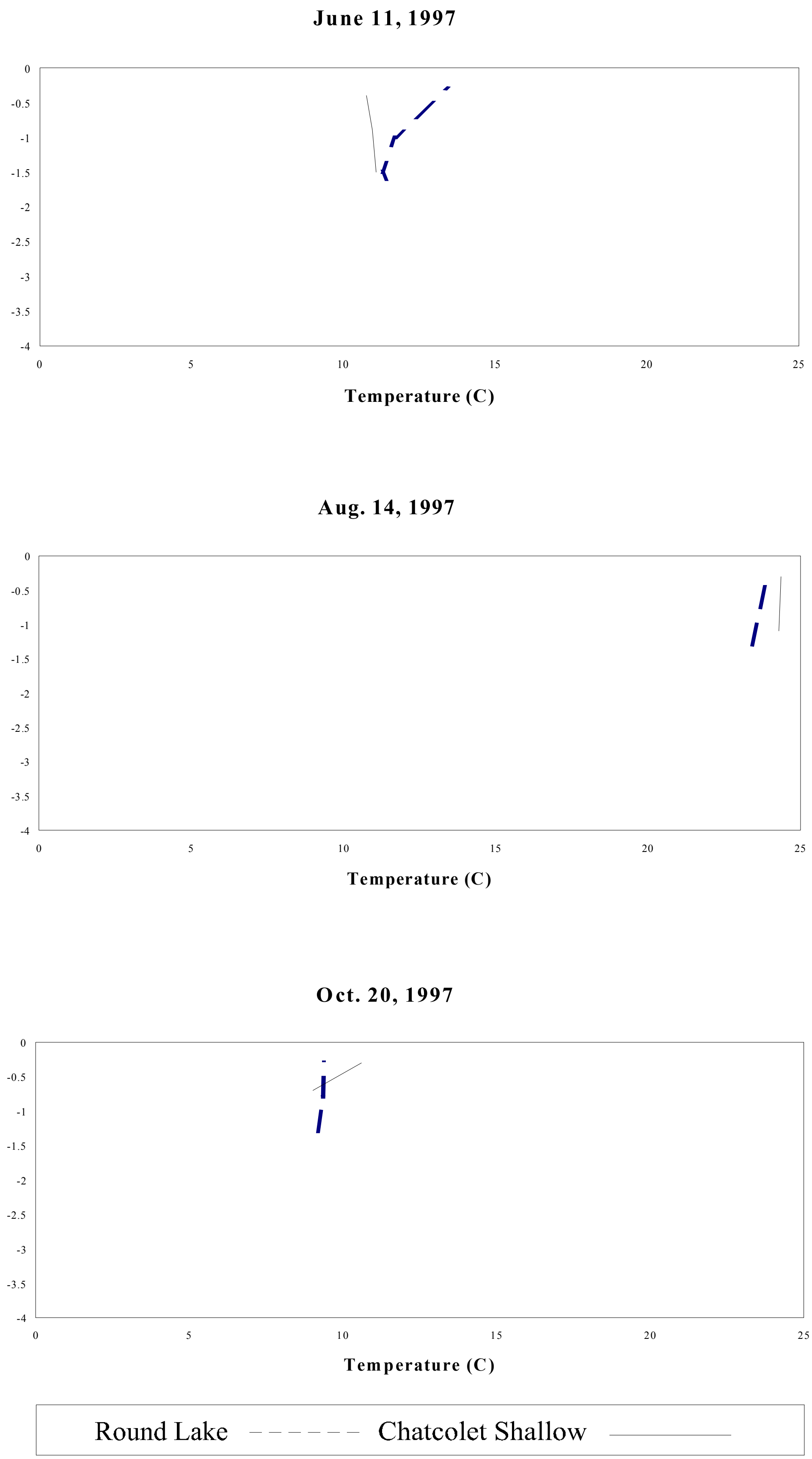


Figure 3.3 Peak spring, summer and fall temperature profiles vs depth for Two geomorphologically similar sampling locations on Coeur d'Alene lake during 1997.

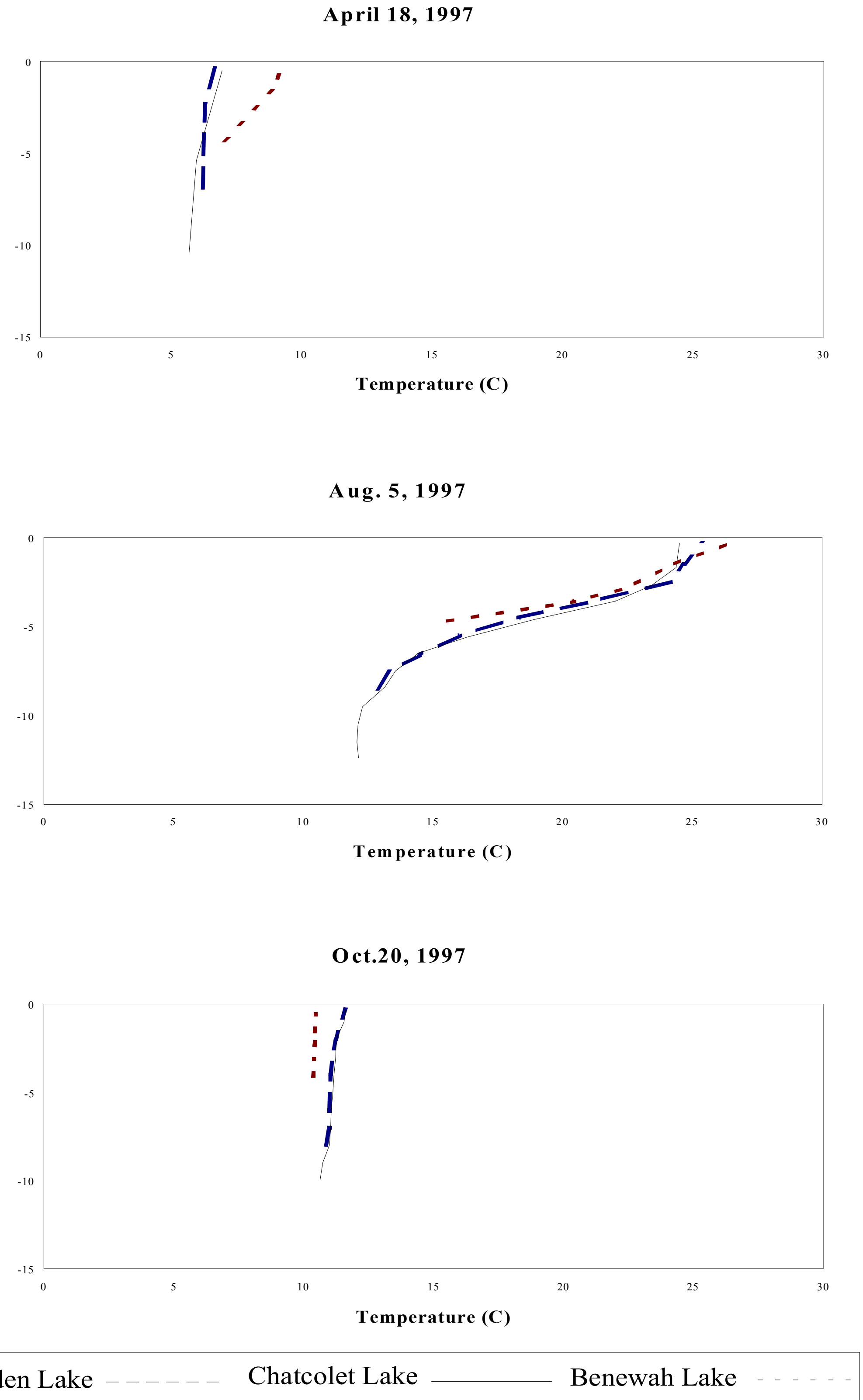


Figure 3.4 Peak spring, summer and fall temperature profiles vs depth for threegomorphologically similar sampling locations on Coeur d'Alene Lake during 1997.

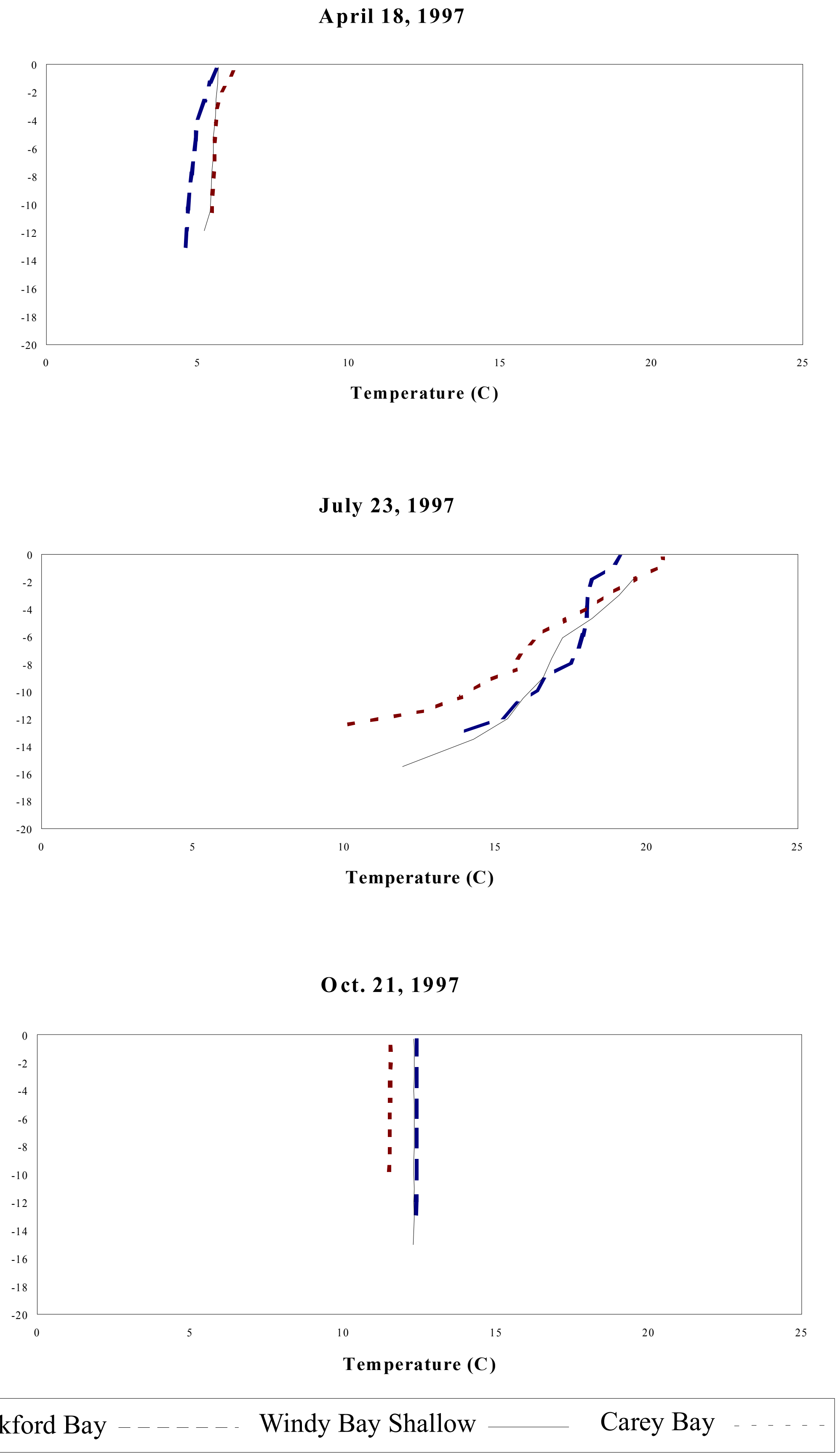


Figure 3.5 Peak spring, summer and fall temperature profiles vs depth for Three geomorphologically similar sampling locations on Coeur d'Alene Lake during 1997.

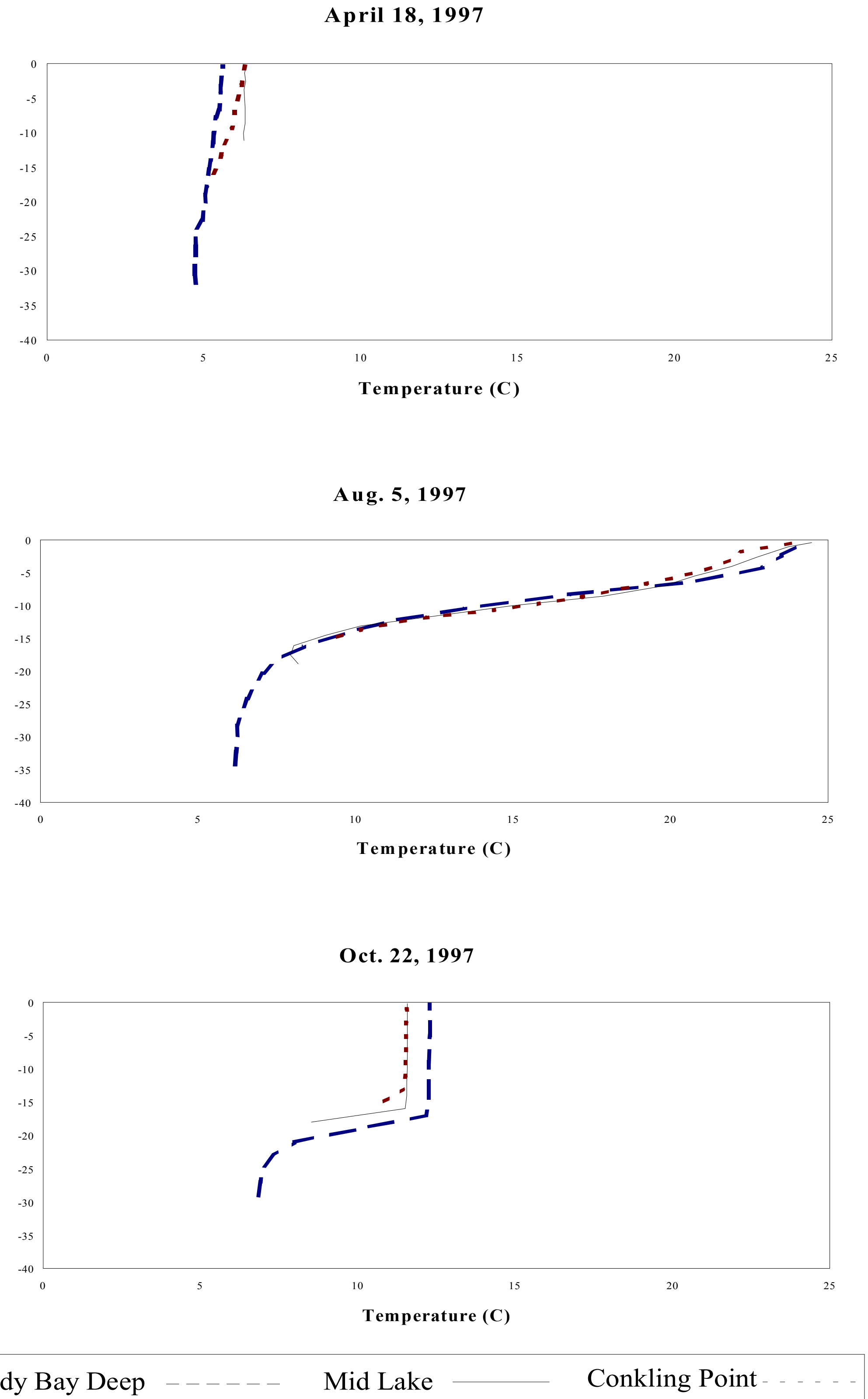


Figure 3.6 Peak spring, summer and fall temperature profiles vs depth for Three geomorphologically similar sampling locations on Coeur d'Alene Lake during 1997.

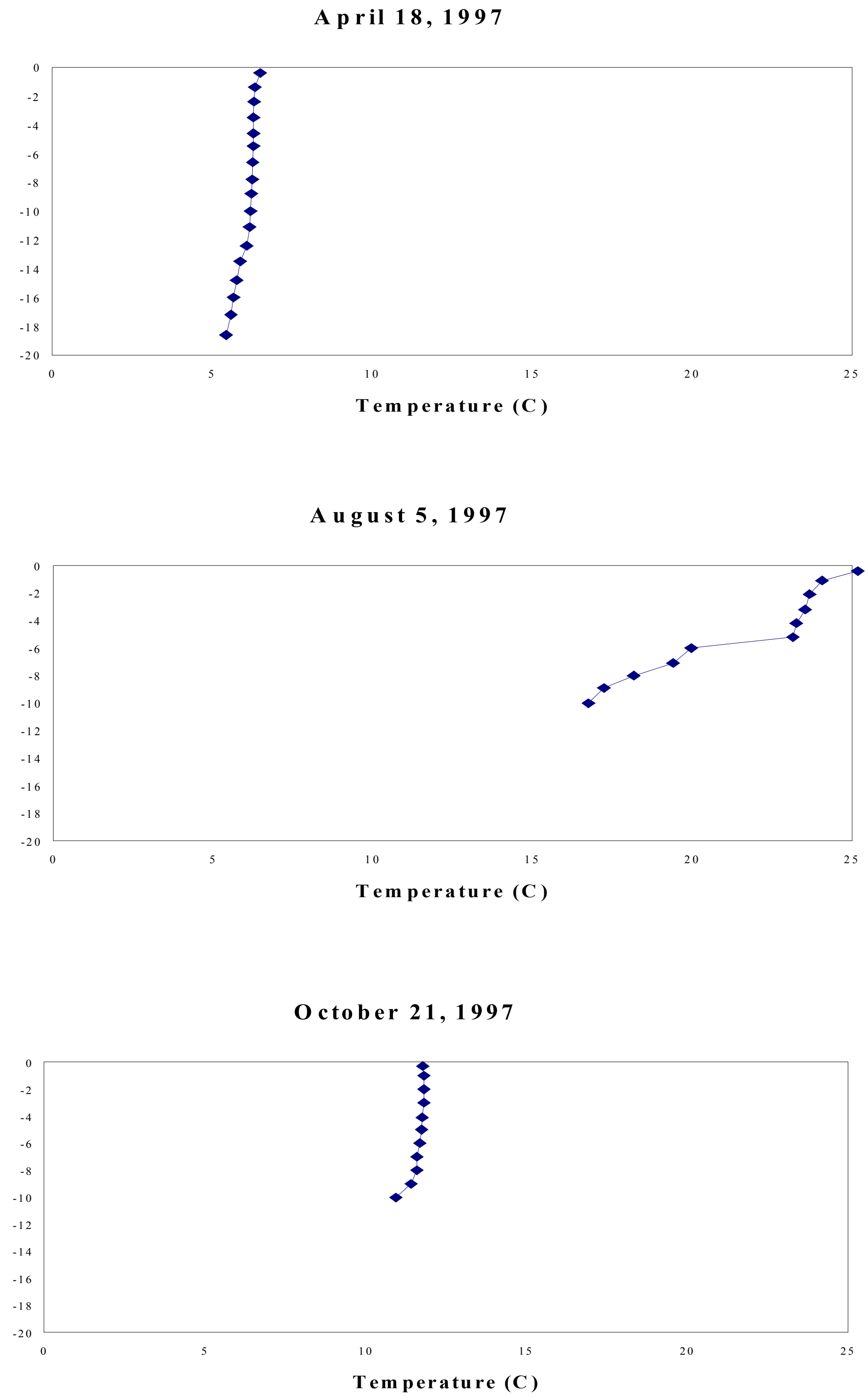


Figure 3.7 Peak spring, summer and fall temperature profiles vs depth for the Coeur d'Alene River during 1997.

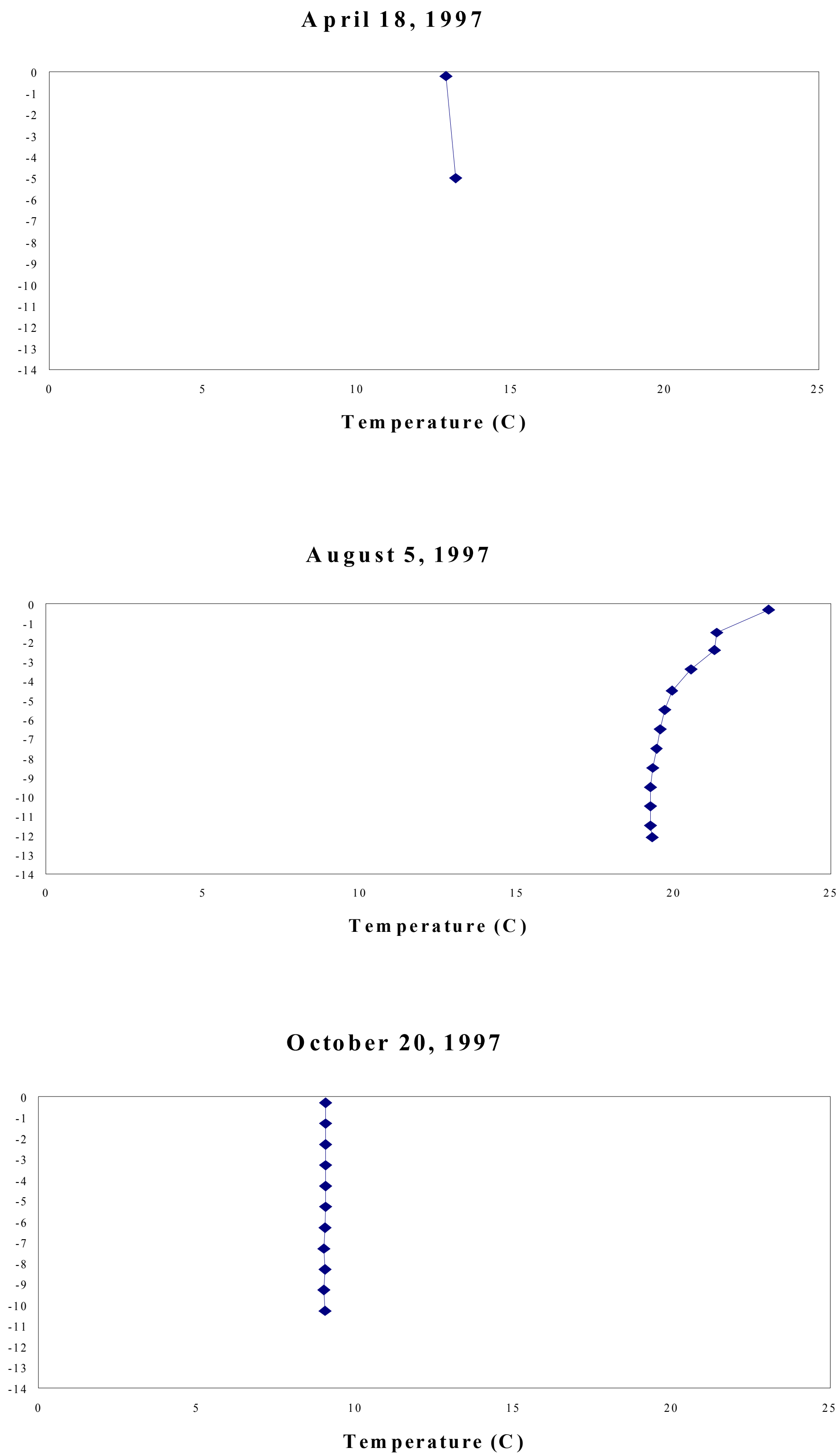


Figure 3.8 St. Joe River peak spring, summer and fall temperature profiles vs depth for 1997.

Table 3.2 Total suspended solids (mg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

		Date			
Nutrients	Location	8/13/97	9/16/97	10/20/97	11/4/97
TSS	Rockford Bay Upper	2.000	2.000	0.250	0.250
	Windy Bay Shallow Upper	2.000	2.000	0.250	0.250
	Windy Bay Deep Upper	2.000	2.000	0.250	0.250
	Coeur d'Alene River Upper	2.000	2.000	0.250	0.250
	Mid Lake Upper	2.000	2.000	0.250	1.500
	Carey Bay Upper	2.000	2.000	0.250	4.000
	Conkling Point Upper	2.000	2.000	0.250	6.500
	Hidden Lake Upper	10.000	97.000	2.500	0.250
	Round Lake	2.000	2.000	1.500	16.000
	Chatcolet Lake Upper	2.000	2.000	2.000	0.250
	Chatcolet Lake Shallow	10.000	16.000	6.500	4.000
	Benewah Lake Upper	10.000	3.000	8.000	-
	St. Joe River Upper	-	2.000	5.000	3.000

- No sample taken to lab.

Table 3.3 Total suspended solids (mg/L) results from the hypolimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

			Date		
Nutrients	Location	8/13/97	9/16/97	10/20/97	11/4/97
TSS	Rockford Bay Lower	2.000	2.000	0.250	0.250
	Windy Bay Shallow Lower	2.000	2.000	0.250	0.250
	Windy Bay Deep Lower	2.000	2.000	0.250	29.000
	Coeur d'Alene River Lower	3.000	2.000	0.250	1.500
	Mid Lake Lower	2.000	2.000	1.000	3.000
	Carey Bay Lower	2.000	2.000	0.250	4.000
	Conkling Point Lower	2.000	2.000	0.250	7.500
	Hidden Lake Lower	10.000	2.000	3.000	0.250
	Chatcolet Lake Lower	20.000	5.000	12.500	0.250
	St. Joe River Lower	-	2.000	4.500	0.250

- No sample taken to lab.

solids was completed. However, it was noted that high levels of suspended sediment were present in the southern lakes sample station and that most likely the high suspended solids present in the Windy Bay deep station was related to decomposing algae not sediment.

Turbidity in the epilimnion and hypolimnion showed the same trend as suspended solids (Tables 3.4 and 3.5) with a general increase on a North to South axis. The highest turbidity reading was recorded at the Chatcolet shallow sample station (11.2 NTU). The next highest was Benewah Lake (5.810 NTU) followed by Hidden Lake (4.760 NTU). The lowest value was recorded at the Windy Bay Deep sample station (0.230 NTU). The high turbidity readings were due to suspended sediments flowing in from Plummer Creek a tributary to Chatcolet Lake.

The following nutrients were tested for on two dates, one in October and one in November, in Coeur d'Alene Lake: ortho-phosphate, nitrate, and nitrite. Ortho-phosphate concentrations were below the detection limit (0.026 mg/l) at all sites in both the epilimnion and hypolimnion (Tables 3.6 and 3.7). The data were reported as half of the detection limit so data point loss would not occur. For the most part nitrate concentrations sampled at the 13 stations (Table 3.8) were below the detection limit (0.005 mg/l) thus, all data below detection limits were reported as half detection limit. In only a few instances (both stations in Windy Bay, Rockford Bay, and the two shallow stations) did nitrate concentrations exceed the detection limit in the epilimnion, reaching a high of 0.113 mg/l at the Rockford Bay sample station in the October sample period. However, in the hypolimnion concentrations of nitrate generally increased in the November sample (Table 3.9) over the October sample period reaching a high of 0.131 mg/l in the Windy Bay Deep sample station. Nitrite, the form of nitrogen found in the smallest quantities were all below the detection limit in the epilimnion and hypolimnion for both samples (Tables 3.10 and 3.11) at all thirteen stations. All data measured below the detection limit were recorded as half the detection limit.

Secchi disk readings were taken at each of the thirteen stations throughout the year and they were used to determine the euphotic zone depth. Graphs showing the measured secchi disk readings and the empirically derived euphotic zone depth are located in Appendix B. The empirically derived euphotic zone depth was variable throughout the lake (Table 3.12) with each station having different depths based on variable site-specific conditions. Similarities existed between the five distinct habitat areas, however, the general trend was decreasing secchi and euphotic zone depths in a north to south direction within the lake.

Chlorophyll$_a$ values ranged from 0.005 μg/l to 25.790 μg/l (Table 3.13) in the epilimnion while values ranged from 0.005 μg/l to 34.14 μg/l (Table 3.14) in the hypolimnion. The general trend is increasing values in a north to south direction. Higher levels of chlorophyll$_a$ is an indicator of increasing trophic status.

Table 3.4 Turbidity (NTU) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

		Date			
Nutrients	Location	8/13/97	9/16/97	10/20/97	11/4/97
Turbidity	Rockford Bay Upper	0.350	0.300	0.270	0.240
	Windy Bay Shallow Upper	0.630	0.330	0.270	0.250
	Windy Bay Deep Upper	0.280	0.400	0.230	0.270
	Coeur d'Alene River Upper	0.870	0.510	0.510	0.430
	Mid Lake Upper	0.330	1.990	0.840	0.380
	Carey Bay Upper	0.560	0.840	0.880	0.490
	Conkling Point Upper	0.540	0.760	0.760	0.860
	Hidden Lake Upper	4.760	1.560	0.960	1.420
	Round Lake	3.820	0.450	1.880	0.930
	Chatcolet Lake Upper	1.010	1.390	1.080	1.610
	Chatcolet Lake Shallow	3.690	0.770	2.010	11.200
	Benewah Lake Upper	5.810	1.550	1.600	-
	St. Joe River Upper	-	0.620	1.87	7.860

- No sample taken to lab.

Table 3.5 Turbidity (NTU) results from the hypolimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

			Date		
Nutrients	Location	8/13/97	9/16/97	10/20/97	11/4/97
Turbidity	Rockford Bay Lower	0.600	0.370	0.240	0.270
	Windy Bay Shallow Lower	0.920	0.420	0.280	0.850
	Windy Bay Deep Lower	0.860	0.870	0.670	0.740
	Coeur d'Alene River Lower	1.020	0.510	0.850	0.880
	Mid Lake Lower	1.300	0.820	1.130	0.760
	Carey Bay Lower	0.560	0.840	0.880	0.490
	Conkling Point Lower	1.870	2.000	0.920	1.010
	Hidden Lake Lower	1.310	3.60	1.060	1.390
	Chatcolet Lake Lower	3.520	1.900	2.630	3.680
	St. Joe River Lower	-	0.760	1.830	7.680

- No sample taken to lab.

Table 3.6 Ortho-Phosphate (mg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

		Date	
Nutrients	Location	10/20/97	11/4/97
Ortho-Phosphate	Rockford Bay Upper	0.013	0.013
	Windy Bay Shallow Upper	0.013	0.013
	Windy Bay Deep Upper	0.013	0.013
	Coeur d'Alene River Upper	0.013	0.013
	Mid Lake Upper	0.013	0.013
	Carey Bay Upper	0.013	0.013
	Conkling Point Upper	0.013	0.013
	Hidden Lake Upper	0.013	0.013
	Round Lake	0.013	0.013
	Chatcolet Lake Upper	0.013	0.013
	Chatcolet Lake Shallow	0.013	0.013
	Benewah Lake Upper	0.013	-
	St. Joe River Upper	0.013	0.013

- No sample taken to lab.

Table 3.7 Phosphate (mg/L) results from the hypolimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

		Date	
Nutrients	Location	10/20/97	11/4/97
Phosphate	Rockford Bay Lower	0.013	0.013
	Windy Bay Shallow Lower	0.0013	0.013
	Windy Bay Deep Lower	0.013	0.013
	Coeur d'Alene River Lower	0.013	0.013
	Mid Lake Lower	0.013	0.013
	Carey Bay Lower	0.013	0.013
	Conkling Point Lower	0.013	0.013
	Hidden Lake Lower	0.013	0.013
	Chatcolet Lake Lower	0.013	0.013
	St. Joe River Lower	0.013	0.013

Table 3.8 Nitrate (mg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

Nutrients	Location	Date 10/20/97	 11/4/97
Nitrate	Rockford Bay Upper	0.113	0.053
	Windy Bay Shallow Upper	0.003	0.059
	Windy Bay Deep Upper	0.003	0.053
	Coeur d'Alene River Upper	0.003	0.003
	Mid Lake Upper	0.003	0.003
	Carey Bay Upper	0.003	0.003
	Conkling Point Upper	0.003	0.003
	Hidden Lake Upper	0.003	0.003
	Round Lake	0.003	0.067
	Chatcolet Lake Upper	0.003	0.003
	Chatcolet Lake Shallow	0.003	0.043
	Benewah Lake Upper	0.003	-
	St. Joe River Upper	0.003	0.066

- No sample taken to lab.

Table 3.9 Nitrate (mg/L) results from the hypolimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

Nutrients	Location	Date 10/20/97	 11/4/97
Nitrate	Rockford Bay Lower	0.003	0.050
	Windy Bay Shallow Lower	0.003	0.063
	Windy Bay Deep Lower	0.131	0.075
	Coeur d'Alene River Lower	0.003	0.101
	Mid Lake Lower	0.054	0.128
	Carey Bay Lower	0.003	0.003
	Conkling Point Lower	0.003	0.125
	Hidden Lake Lower	0.003	0.003
	Chatcolet Lake Lower	0.003	0.003
	St. Joe River Lower	0.003	0.003

Table 3.10 Nitrite results (mg/L) from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

Nutrients	Location	Date 10/20/97	11/4/97
Nitrite	Rockford Bay Upper	0.013	0.013
	Windy Bay Shallow Upper	0.013	0.013
	Windy Bay Deep Upper	0.013	0.013
	Coeur d'Alene River Upper	0.013	0.013
	Mid Lake Upper	0.013	0.013
	Carey Bay Upper	0.013	0.013
	Conkling Point Upper	0.013	0.013
	Hidden Lake Upper	0.013	0.013
	Round Lake	0.013	0.013
	Chatcolet Lake Upper	0.013	0.013
	Chatcolet Lake Shallow	0.013	0.013
	Benewah Lake Upper	0.013	-
	St. Joe River Upper	0.013	0.013

- No sample taken to lab.

Table 3.11 Nitrite (mg/L) results from the hypolimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

Nutrients	Location	Date 10/20/97	11/4/97
Nitrite	Rockford Bay Lower	0.013	0.013
	Windy Bay Shallow Lower	0.013	0.013
	Windy Bay Deep Lower	0.013	0.013
	Coeur d'Alene River Lower	0.013	0.013
	Mid Lake Lower	0.013	0.013
	Carey Bay Lower	0.013	0.013
	Conkling Point Lower	0.013	0.013
	Hidden Lake Lower	0.013	0.013
	Chatcolet Lake Lower	0.013	0.013
	St. Joe River Lower	0.013	0.013

Table 3.12 Average annual and seasonal secchi measurements taken at thirteen stations on Coeur d' Alene Lake in 1997. Euphotic zone depths were empirically derived using the regression equation EZD=2.2302+1.4914(SD)R^2=.78 published by Alaska Fish and Game 1987. All measurements are in meters.

			Average	Spring		Summer		Fall	
Location	Station Depth	Annual Secchi[a]	Annual Euphotic Zone	Seasonal Secchi[b]	Seasonal Euphotic Zone	Seasonal Secchi[c]	Seasonal Euphotic Zone	Seasonal Secchi[d]	Seasonal Euphotic Zone
Round Lake	1.50	1.27	Bottom (1.5)[e]	1.20	Bottom (1.5)	1.31	Bottom (1.5)	1.23	Bottom (1.5)
Chatcolet Shallow	1.50	.89	Bottom (1.5)	1.00	Bottom (1.5)	0.87	Bottom (1.5)	0.77	Bottom (1.5)
Rockford Bay	13.00	5.29	10.11	153	4.50	6.43	11.81	7.63	13.61
Windy Bay Shallow	14.00	4.58	9.05	1.66	4.71	5.37	10.24	6.60	12.07
Carey Bay	12.00	4.10	8.34	1.73	4.80	5.13	9.87	4.87	9.48
Windy Bay Deep	33.00	5.44	10.35	1.75	4.84	6.77	12.33	7.27	13.07
Mid Lake	18.00	4.08	8.31	1.74	4.82	5.00	9.68	5.03	9.73
Conkling Point	16.00	3.44	7.36	1.43	4.36	4.16	8.43	4.47	8.89
Hidden Lake	8.00	3.02	6.81	1.58	4.65	3.94	8.18	2.80	6.48
Chatcolet Lake	11.50	2.56	6.04	1.65	4.69	3.01	6.73	2.70	6.26
Benewah Lake	4.50	2.42	5.84	1.60	4.62	2.96	6.64	2.20	5.51
Coeur d'Alene River	10.00	3.92	8.08	1.50	4.47	4.73	9.28	5.27	10.08
St. Joe River	12.50	2.25	5.58	1.08	3.83	3.18	6.98	1.93	5.11

[a] Average annual secchi was calculated from April 18, 1997 to November 4, 1997.
[b] Annual Spring secchi is from April 18, 1997 to June 11, 1997.
[c] Annual Summer secchi is from June 26, 1997 to September 17, 1997.
[d] Annual Fall secchi is from September 29, 1997 to November 4, 1997.
[e] Numbers in parenthesis represent the bottom in meters.

Table 3.13 Chlorophyll$_a$ (µg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

Nutrients	Location	Date 8/13/97	9/16/97	10/20/97	11/4/97[a]
Chlorophyll$_a$	Rockford Bay Upper	0.005	0.700	0.005	3.300
	Windy Bay Shallow Upper	0.005	0.005	0.740	2.140
	Windy Bay Deep Upper	0.005	1.340	2.230	1.380
	Coeur d'Alene River Upper	0.650	0.005	-	2.960
	Mid Lake Upper	1.420	0.640	1.900	2.910
	Carey Bay Upper	0.640	0.005	-	1.280
	Conkling Point Upper	0.005	2.160	1.380	3.390
	Hidden Lake Upper	0.005	Contaminated	3.620	6.890
	Round Lake	0.005	1.540	0.670	0.640
	Chatcolet Lake Upper	3.140	2.810	4.260	7.660
	Chatcolet Lake Shallow	5.320	4.890	2.780	0.690
	Benewah Lake Upper	0.640	25.790	3.540	-
	St. Joe River Upper	-	Contaminated	1.400	0.005

- No sample taken to lab.
[a] Coeur d' Alene Lake was isothermal.

Table 3.14 Chlorophyll$_a$ (µg/L) results from the hypolimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho.

Nutrients	Location	Date 8/13/97	9/16/97	10/20/97	11/4/97[a]
Chlorophyll$_a$	Rockford Bay Lower	1.400	2.090	-	-
	Windy Bay Shallow Lower	2.140	0.680	-	-
	Windy Bay Deep Lower	0.640	0.680	0.005	-
	Coeur d'Alene River Lower	0.690	1.320	0.005	-
	Mid Lake Lower	0.690	2.070	1.380	-
	Carey Bay Lower	0.005	1.330	1.400	-
	Conkling Point Lower	0.005	1.370	0.005	-
	Hidden Lake Lower	11.920	20.250	1.980	-
	Chatcolet Lake Lower	6.030	Contaminated	14.04	-
	Benewah Lake Lower	34.14	28.78	-	-
	St. Joe River Lower	-	0.700	0.005	-

- No sample taken to lab.
[a] Coeur d' Alene Lake was isothermal.

3.1.2 Fisheries

From 1994-1997 Coeur d'Alene Lake was sampled using electrofishing (n= 8280) and gillnetting (n=1211) methods, primarily from April- October each year. Both the littoral and limnetic zones were sampled. Eighteen of the twenty-one species of fish known to occur in the lake were captured. Electrofishing efforts were focused in the littoral zone while gillnetting efforts were focused primarily in the limnetic zone, however, some gillnetting effort was focused in the littoral zones as well.

Relative abundance estimates derived from electrofishing data show that 61.89% of the catch consisted of introduced species, with yellow perch and largemouth bass being the most abundant (Table 3.15). Yellow perch were the most abundant introduced species in each of the four years sampled. Native fishes comprised only 38.11% of the catch, with largescale suckers being the most abundant. Largescale suckers were the most abundant native species in each of the individual sample seasons. Cutthroat trout only comprised 0.83% of the catch from 1994-1997. Of the 69 cutthroat trout caught in the littoral zone between 1994-1997, 47 were captured at night and only 22 were captured during the day.

Table 3.15 Electrofishing relative abundance from 1994-1997.

	1994		1995		1996		1997		1994-1997
Species	(n=1418)	Species	(n=1727)	Species	(n=536)	Species	(n=4599)	Species	(n=8280)
YP	25.88% (367)	LSS	27.74% (479)	LSS	28.92% (155)	LSS	28.55% (1313)	LSS	27.27% (2258)
LSS	21.93% (311)	YP	26.52% (458)	YP	22.01% (118)	YP	22.94% (1055)	YP	24.13% (1998)
LMB	18.55% (263)	LMB	13.20% (228)	PSS	15.30% (82)	PSS	10.55% (485)	LMB	11.92% (987)
SQW	10.65% (151)	PSS	10.48% (181)	SQW	15.11% (81)	LMB	09.92% (456)	PSS	10.28% (851)
PSS	07.26% (103)	SQW	06.89% (119)	LMB	07.46% (40)	SQW	09.35% (430)	SQW	09.43% (781)
BC	06.63% (94)	BBH	05.19% (102)	BC	04.66% (25)	BC	08.52% (392)	BC	06.87% (569)
TCH	02.40% (34)	TCH	04.17% (72)	TCH	02.99% (16)	BBH	04.02% (185)	BBH	04.01% (332)
BBH	02.19% (31)	BC	03.36% (58)	BBH	02.61% (14)	TCH	03.50% (161)	TCH	03.42% (283)
PIK	01.48% (21)	CTT	0.75% (13)	PIK	0.56% (3)	CTT	0.78% (36)	CTT	0.83% (69)
CTT	01.27% (18)	MWF	0.41% (7)	CTT	0.37% (2)	PIK	0.50% (23)	PIK	0.58% (48)
KOK	01.13% (16)	SCP	0.29% (5)	BLT	0	SCP	0.43% (20)	KOK	0.41% (34)
SCP	0.49% (7)	KOK	0.17% (3)	CCF	0	KOK	0.33% (15)	SCP	0.39% (32)
MWF	0.07% (1)	BLT	0.06% (1)	CHN	0	CHN	0.30% (14)	MWF	0.18% (15)
CCF	0.07% (1)	PIK	0.06% (1)	KOK	0	MWF	0.15% (7)	CHN	0.17% (14)
SMB	0	CCF	0	MWF	0	CCF	0.09% (4)	CCF	0.06% (5)
RBT	0	CHN	0	RBT	0	SMB	0.04% (2)	SMB	0.02% (2)
CHN	0	RBT	0	SCP	0	RBT	0.02% (1)	RBT	0.01% (1)
BLT	0	SMB	0	SMB	0	BLT	0	BLT	0.01% (1)

Relative abundance estimates derived from gillnetting data show 57.89% of the fish captured were introduced species (Table 3.16). Native fishes comprised only 42.11% of the catch of which cutthroat trout comprised 0.91%. These data show that nine species of fish were more abundant than cutthroat trout lakewide. However, cutthroat trout were the fourth most abundant species in locations where they were captured. In nearly all transects where cutthroat trout were captured, kokanee salmon were the most abundant species, followed by northern squawfish and largescale suckers.

Largescale suckers and northern squawfish thrive throughout the lake. They do just as well in both the limnetic and littoral zones of the lake. Most of the other introduced species are primarily limited to the littoral zone of the lake, the area most influenced by construction of Post Falls dam. Kokanee salmon appear to be the introduced species that most effectively thrive in the limnetic zones of the lake. Chinook salmon are also found primarily in the limnetic zones, however, they are less susceptible to the capture methods that we utilized for this report.

Cutthroat trout captured in the littoral zone were found primarily in habitat associated with steep, rocky shorelines where few aquatic macrophytes exist. Of the thirty-six cutthroat trout captured in 1997, sixteen were caught in inundated riverine habitat or in reaches near mouths of tributaries where spawning is known to occur. Cutthroat trout caught in the limnetic zone were captured in nets set in locations greater than ten meters deep.

Analysis of the CPUE (Tables 3.17 and 3.18) data shows wide fluctuations from year to year. Every attempt was made to standardize gear and methods in 1997. Future estimates should contain less bias and more accurately reflect actual stock densities.

Results from the water quality component of the HSI model indicated that there is suitable habitat for cutthroat trout in the lake (Table 3.19). The quantity of suitable habitat, however, decreases as water temperature increases during the year. The suitability index was poor or very poor (<0.25) in the shallow portion of the water column at all sample stations. While water quality does not directly exclude cutthroat trout from these shallow areas, unsuitable habitat exerts added stress on cutthroat trout making foraging runs into the upper 10 meters of the water column.

3.2 Stream Studies

3.2.1 Water Quality

Lake Creek

Water temperature measured at the lower Lake Creek station indicated a maximum of 24° C on July 21, 1997. The maximum 7-day moving average at the same station exceeded 16° C through most of June and all of July. Daily temperature fluctuations ranged from 4.7° C to 7.8° C during July, indicating that substantial cooling did take place. A gap in data from late July to October due to equipment failure probably missed continued temperature pollution problems, as stream temperatures generally do not begin cooling until late August. Temperatures recorded at the upper Lake Creek station are considerably lower. The maximum 7-day moving average exceeded 16° C from August 1-20, while the daily maximum exceeded 18° C only once (8-6-97). Dissolved oxygen did not drop below 9 mg/l at the lower station, where the highest temperatures were recorded. Measured base flows ranged from 3.8 to 7.9 cfs from July 1 through August 9.

Benewah Creek

A maximum temperature of 24° C was recorded at the 9 mile station on August 6, 1997. The maximum 7-day moving average exceeded 16° C from mid June through mid September and minimum temperature did not fall below 16° C for 15 days during this period. Dissolved oxygen was less than 9 mg/l during the period of highest water temperatures, but did not drop below 7.6 mg/l. Discharge at the 3 mile station ranged from 2.9 to 3.9 cfs from mid August through September.

Water quality conditions in the tributaries varied greatly, but in general provided more suitable water temperatures than mainstem reaches. Temperature did not exceed 16° C in S.F. Benewah Creek and dissolved oxygen did not drop below 9 mg/l. Discharge, however, was less than 1.0 cfs from mid August

Table 3.16 Electroshocking catch per unit effort from 1994-1997.

1994			1995			1996			1997			1994-1997		
		Time/hr			Time/hr			Time/hr			Time/Hr			Time/Hr
Species	(n=1418)	**20.93**	Species	(n=1727)	**24.89**	Species	(n=536)	**12.0**	Species	(n=4599)	**42.45**	Species	(n=8280)	**100.27**
YP	367	17.53	LSS	479	19.24	LSS	157	13.08	LSS	1313	30.93	LSS	2258	22.52
LSS	311	14.86	YP	458	18.40	YP	123	10.25	YP	1055	24.85	YP	1998	19.93
LMB	263	12.57	LMB	228	9.16	SQW	86	7.17	PSS	485	11.43	PSS	987	9.84
SQW	151	7.21	PSS	181	7.27	PSS	82	6.83	LMB	456	10.74	LMB	851	8.49
PSS	103	4.92	SQW	119	4.78	LMB	41	3.42	SQW	430	10.13	SQW	781	7.79
BC	94	4.49	BBH	102	4.10	BC	25	2.08	BC	392	9.23	BC	569	5.67
TCH	34	1.62	TCH	72	2.89	BBH	19	1.58	BBH	185	4.36	BBH	332	3.31
BBH	31	1.48	BC	58	2.33	TCH	16	1.33	TCH	161	3.79	TCH	283	2.82
PIK	21	1.00	CTT	13	0.52	PIK	3	0.25	CTT	36	0.85	CTT	69	0.69
CTT	18	0.86	MWF	7	0.28	CTT	2	0.17	PIK	23	0.54	PIK	48	0.48
KOK	16	0.76	SCP	5	0.20	BLT	0	0.00	SCP	20	0.47	KOK	34	0.34
SCP	7	0.33	KOK	3	0.12	CCF	0	0.00	KOK	15	0.35	SCP	32	0.32
CCF	1	0.05	BLT	1	0.04	CHN	0	0.00	CHN	14	0.33	MWF	15	0.15
MWF	1	0.05	PIK	1	0.04	KOK	0	0.00	MWF	7	0.16	CHN	14	0.14
BLT	0	0.00	CCF	0	0.00	MWF	0	0.00	CCF	4	0.09	CCF	5	0.05
CHN	0	0.00	CHN	0	0.00	RBT	0	0.00	SMB	2	0.05	SMB	2	0.02
RBT	0	0.00	RBT	0	0.00	SCP	0	0.00	RBT	1	0.02	RBT	1	0.01
SMB	0	0.00	SMB	0	0.00	SMB	0	0.00	BLT	0	0.00	BLT	1	0.01

Table 3.17 Gillneting relative abundance from 1994-1997.

1994		1995		1996		1997		1994-1997	
Species	(n=211)	Species	(n=78)	Species	(n=286)	Species	(n=636)	Species	(n=1211)
YP	63.51% (134)	YP	65.38% (51)	LSS	41.96% (120)	YP	34.28% (218)	YP	40.71% (493)
SQW	16.11% (34)	SQW	20.51% (16)	YP	31.47% (90)	LSS	21.23% (135)	LSS	23.45% (284)
LSS	09.00% (19)	LSS	12.82% (10)	SQW	16.08% (46)	SQW	18.55% (118)	SQW	17.67% (214)
BBH	02.84% (6)	BBH	01.28% (1)	BBH	02.45% (7)	KOK	10.06% (64)	KOK	06.28% (76)
KOK	02.84% (6)	BC	0	KOK	02.10% (6)	BBH	07.39% (47)	BBH	05.04% (61)
PSS	01.90% (4)	BLT	0	PIK	01.40% (4)	BC	02.52% (16)	BC	01.57% (19)
PIK	01.42% (3)	CCF	0	TCH	01.40% (4)	CTT	01.42% (9)	TCH	01.16% (14)
TCH	0.95% (2)	CHN	0	CCF	01.05% (3)	TCH	01.26% (8)	PSS	01.07% (13)
BC	0.47% (1)	CTT	0	PSS	01.05% (3)	PSS	0.94% (6)	PIK	0.99% (12)
CTT	0.47% (1)	KOK	0	BC	0.70% (2)	CHN	0.79% (5)	CTT	0.91% (11)
LMB	0.47% (1)	LMB	0	CTT	0.35% (1)	PIK	0.79% (5)	CCF	0.58% (7)
BLT	0	MWF	0	BLT	0	CCF	0.63% (4)	CHN	0.41% (5)
CCF	0	PIK	0	CHN	0	MWF	0.16% (1)	MWF	0.08% (1)
CHN	0	PSS	0	LMB	0	BLT	0	LMB	0.08% (1)
MWF	0	RBT	0	MWF	0	LMB	0	SMB	
RBT	0	SCP	0	RBT	0	RBT	0	SCP	
SCP	0	SMB	0	SCP	0	SCP	0	RBT	
SMB	0	TCH	0	SMB	0	SMB	0	BLT	

Table 3.18 Gillneting catch per unit effort from 1994-1997.

1994			1995			1996			1997			1994-1997		
Species	(n=211)	**69**	Species	(n=78)	**79**	Species	(n=286)	**170.50**	Species	(n=636)	**677**	Species	(n=1211)	**995.50**
YP	134	1.94	YP	51	0.65	LSS	120	0.70	YP	218	0.32	YP	493	0.50
SQW	34	0.49	SQW	16	0.20	YP	90	0.53	LSS	135	0.20	LSS	284	0.29
LSS	19	0.28	LSS	10	0.13	SQW	46	0.27	SQW	118	0.17	SQW	214	0.21
BBH	6	0.09	BBH	1	0.01	BBH	7	0.04	KOK	64	0.09	KOK	76	0.08
KOK	6	0.09	BC	0	0.00	KOK	6	0.04	BBH	47	0.07	BBH	61	0.06
PSS	4	0.06	BLT	0	0.00	PIK	4	0.02	BC	16	0.02	BC	19	0.02
PIK	3	0.04	CCF	0	0.00	TCH	4	0.02	CTT	9	0.01	CTT	11	0.01
TCH	2	0.03	CHN	0	0.00	CCF	3	0.02	TCH	8	0.01	TCH	14	0.01
BC	1	0.01	CTT	0	0.00	PSS	3	0.02	PSS	6	0.01	PSS	13	0.01
CTT	1	0.01	KOK	0	0.00	BC	2	0.01	CHN	5	0.01	CHN	5	0.01
LMB	1	0.01	LMB	0	0.00	CTT	1	0.01	PIK	5	0.01	PIK	12	0.01
BLT	0	0.00	MWF	0	0.00	BLT	0	0.00	CCF	4	0.01	CCF	7	0.01
CCF	0	0.00	PIK	0	0.00	CHN	0	0.00	MWF	1	0.00	MWF	1	0.00
CHN	0	0.00	PSS	0	0.00	LMB	0	0.00	BLT	0	0.00	BLT	0	0.00
MWF	0	0.00	RBT	0	0.00	MWF	0	0.00	LMB	0	0.00	LMB	1	0.00
RBT	0	0.00	SCP	0	0.00	RBT	0	0.00	RBT	0	0.00	RBT	0	0.00
SCP	0	0.00	SMB	0	0.00	SCP	0	0.00	SCP	0	0.00	SCP	0	0.00
SMB	0	0.00	TCH	0	0.00	SMB	0	0.00	SMB	0	0.00	SMB	0	0.00

Table 3.19 Habitat suitability index for lucustrine Cutthroat Trout based on water quality.

Location	Depth	HSI[a]		Suitability Index
Rockford Bay	0-7 Meters	$(0.25x1x1)^{1/3}$	=	0.25 SI
	7-11 Meters	$(0.60x1x1)^{1/3}$	=	0.845 SI
	11-Bottom (14)[b]	$(1x1x1)^{1/3}$	=	1.0 SI
Windy Bay Shallow	0-7 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	7-10 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	10-Bottom (15)	$(1x1x1)^{1/3}$	=	1.0 SI
Windy Bay Deep	0-10 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	10-15 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	15-Bottom (33)	$(1x1x1)^{1/3}$	=	1.0 SI
Coeur d'Alene River	0-Bottom	$(0.0x1x1)^{1/3}$	=	0.0 SI
Mid-Lake Coeur d'Alene	0-10 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	10-13 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	13-Bottom (17)	$(1x1x1)^{1/3}$	=	1.0 SI
Carey Bay	0-10 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	10-12 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	12-Bottom (13)	$(1x1x1)^{1/3}$	=	1.0 SI
Conkling Park	0-10 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	10-13 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	13-Bottom (16)	$(1x1x1)^{1/3}$	=	1.0 SI
Hidden Lake	0-5 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	5-7 Meters	$(0.8x1x1)^{1/3}$	=	0.92 SI
	7-Bottom (10)	$(1x0.0x1)^{1/3}$	=	0.0 SI
Round Lake	0-Bottom (1.5)	$(0.0x1x1)^{1/3}$	=	0.0 SI
Chatcolet Lake	0-6 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	6-9 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	9-Bottom (11)	$(1x0.0x1)^{1/3}$	=	0.0 SI
Chatcolet Shallow	0-Bottom (1.5)	$(0.0x1x1)^{1/3}$	=	0.0 SI
Benewah Lake	0-Bottom (4.5)	$(0.0x1x1)^{1/3}$	=	0.0 SI
St. Joe River	0-Bottom (12.5)	$(0.4x1x1)^{1/3}$	=	0.4 SI

[a] Habitat Suitability Index (HSI).
[b] Numbers in parenthesis represent the bottom in meters.

through early October. Measured water temperatures in W.F. Benewah Creek exceeded 16° C only once in early August and dissolved oxygen did not decrease below 9 mg/l. School House Creek was also a source of cold water and the maximum 7-day moving average exceeded 16° C for only 5 days in August. There were periods where habitat consisted of stagnant pools from July through August and dissolved oxygen decreased from 6.8 to 3.2 mg/l during this time. The maximum 7-day moving average in Windfall Creek exceeded 16° C from mid June through mid September and exceeded 20° C for 40 days. A maximum temperature of 27° C was recorded on August 6. Daily temperature fluctuations were as high as 9.4° C in August and minimum temperature did not drop below 16° C for 9 days. There was no flow in Windfall Creek from late July through August and dissolved oxygen dropped below 9 mg/l during this period.

Evans Creek
Maximum water temperature was 17° C on August 6, 1997. The maximum 7-day moving average exceeded 16° C for 8 days in August. Dissolved oxygen did not drop below 9 mg/l during the period of highest water temperatures. Measured base flows ranged from 2.7 to 4.5 cfs from mid-August through early October.

Alder Creek
Maximum water temperature was 22° C on August 6, 1997. The maximum 7-day moving average exceeded 16° C from mid July through early September. Dissolved oxygen did not drop below 9 mg/l during the period of highest water temperatures. Measured base flows ranged from 1.8 to 0.3 cfs from July through September.

3.2.2 Habitat Suitability Indices

The suitability index (SI) values for individual water quality parameters vary considerably between sample locations (Table 3.20). The greatest variability occurs for the temperature parameter (V_1), where the SI ranges from 0 to 1.0. Water temperatures are limiting for the mainstem of Benewah Creek, lower Lake Creek, and lower Windfall Creek. The SI for the base flow parameter (SI_{14}) is < 0.4 for all sample locations except for Evans Creek and mainstem Benewah Creek, indicating that base flow is also a limiting factor at most locations. The SI for dissolved oxygen (SI_3) and pH (SI_{13}) are generally greater than 0.8, and therefore are not considered limiting. The exception occurs in School House Creek where dissolved oxygen is limiting (SI_3=0.3) during the period of warmest water temperatures.

Table 3.20 Habitat Suitability Index (HSI) calculations for riverine cutthroat trout.

Location	V1	SI1	V3	SI3	V13	SI13	V14	SI14	Comp HSI	Non-Comp HSI
L. Lake	22.6	0	9.5	1	6.8/7.7	1	9	0.2	0.00	0
U. Lake	17.9	0.78	7.9	0.9	6.5/7.5	1	13	0.25	0.65	0.25
L. Benewah	23	0	8.9	1	7.0/8.3	1	18	0.4	0.00	0
U. Benewah	22.8	0	7.7	0.87	6.7/7.6	1	18	0.4	0.00	0
S.E. Benewah	14.7	1	9.7	1	6.6/7.6	1	16	0.32	0.75	0.32
School House	16.4	0.92	5.7	0.3	6.8/7.4	1	6	0.15	0.45	0.15
W.F. Benewah	16.6	0.9	9.3	1	6.7/7.5	1	11	0.25	0.69	0.25
Windfall	25.1	0	7.8	0.89	6.7/7.6	1	13	0.25	0.00	0
Evans	16.4	0.92	9.6	1	6.3/7.7	0.95	28	0.6	0.85	0.6
Alder	20.6	0.45	9.6	1	6.8/7.8	1	16	0.32	0.62	0.32

HSI scores that are calculated using the non-compensatory method show a very poor to poor rating for all sample locations, with the exception of Evans Creek, which is considered good. In other words, when habitat suitability is rated based on water quality parameters alone, then all sample locations, with the exception of Evans Creek, are rated very poor to poor with regard to cutthroat trout preferences. In six of ten locations, however, differences between HSI calculations using the compensatory versus non-compensatory method indicate that good habitat conditions have the potential to partially compensate for short-term degradation in water quality. These sites include upper Lake Creek, S.F. Benewah Creek, School House Creek, W.F. Benewah Creek, Evans Creek, and Alder Creek. Lower Lake Creek, the mainstem of Benewah Creek, and lower Windfall Creek are considered very poor regardless of the method used.

3.2.3 Fisheries

Abundance and Distribution

General patterns of cutthroat trout abundance and distribution vary among the target watersheds and among years, but seem to be highly correlated to seasonal changes in water quality and quantity. Cutthroat trout are sporadically distributed in the Lake Creek, Benewah Creek, and Alder Creek watersheds during both the summer and fall seasons (Tables 3.21 and 3.22). Abundance in the second order tributaries of Lake Creek and Benewah Creek are consistently much higher than in adjacent mainstem reaches, despite the effects of low flow conditions. During base flow conditions, for example, cutthroat trout have been known to crowd into small, isolated pools (>15 fish/m^2) located in cool tributaries, rather than face conditions of high water temperatures in mainstem reaches. In contrast, favorable water quality conditions in Evans Creek result in a relatively even distribution of cutthroat trout. Cutthroat trout abundance is consistently lowest in Alder Creek.

Surveys conducted in 1997 showed that cutthroat trout abundance increased dramatically during the fall sample period. Fall surveys were conducted following fry emergence, which occurs in late June to early July, and young of the year fish accounted for most of the seasonal variation in abundance within sites (Table 3.23). Young of the year fish were found principally in small tributaries, which supports the hypothesis that the majority of spawning activity takes place in second order streams in these watersheds.

Brook trout have been found only in Alder Creek and Benewah Creek; the respective dates of introduction are unknown. Fish are distributed in fairly high numbers (up to 30/100m^2) throughout the upper reaches of the Alder Creek watershed. Distribution in the Benewah Creek watershed is limited to the upper mainstem and a few of the primary tributaries and abundance is typically much lower than for cutthroat trout. In Alder Creek, however, brook trout are found in greater numbers than cutthroat trout in all but the lowermost stream reaches (Table 3.24).

Age and Growth

A total of 680 cutthroat trout scales were examined for age and growth determination in 1996 and 162 additional scales were examined in 1997. Growth and potential maximum size of cutthroat trout varies from stock to stock (Table 3.25). The adfluvial stocks found in Benewah Creek and Lake Creek exhibit the maximum growth potential for this species. Record size for Lake Creek cutthroat trout is 17.9 inches (456 mm TL) and 1.5 pounds (698 grams), caught in 1997. Record size for Benewah Creek cutthroat trout is 16.8 inches (427 mm TL) and 1.5 pounds (670 grams), caught in 1994. Maximum growth for resident fish stocks ranges from 222 to 280 mm total length and 102 to 180 grams. A complete tabular analysis of growth for cutthroat trout is provided in Appendix C.

Table 3.21 Cutthroat trout abundance and distribution by watershed, 1996.

Cutthroat Trout Lake Creek		Summer 96		Fall 96	
Tributary	Reach	N±(SE)	#/100m2	N±(SE)	#/100m2
Mainstem	1	1	0.5	1	0.3
	2	--	--	--	--
	3	--	--	--	--
	4	23	7.7	36(0.7)	12.1
	5	18	4.8	2	0.5
	6	31(0.4)	4.9	33(1.2)	3.9
	7	16	2.4	6	0.4
	8	7	4.2	0	0.0
West Fork		91(25.7)	16.9	6(0.8)	6.5
Bozard		25(0.3)	10.8	11	5.1
Totals		212(25.7)		83(2.5)	

Cutthroat Trout Evans Creek		Summer 96	
Tributary	Reach	N±(SE)	#/100m2
Mainstem	1	0	0.0
	2	18(0.9)	4.0
	3	4	1.5
	4	33(4.31)	4.9
	5	23(0.6)	10.3
	6	5	2.2
	7	30(4.1)	4.9
East Fork		6	10.8
Rainbow Fork		36(3.6)	19.4
South Fork		34(6.9)	12.2
Totals		189(9.9)	

Cutthroat Trout Benewah Creek		Summer 96		Fall 96	
Tributary	Reach	N±(SE)	#/100m2	N±(SE)	#/100m2
Mainstem	1	1	0.4	2.0	0.5
	2	5(1.5)	0.8	4.0	1.8
	3	14(0.3)	6.3	10	1.6
	4	5(1.0)	1.1	5(1.5)	1.5
	5	3	1.2	0	0.0
	7	--	--	7	0.9
	8	4	1.4	7	2.5
	9	12(4.2)	1.9	2	0.5
	10	14(0.6)	1.4	9	0.9
	11	3	1.2	0	0.0
South Fork		6	5.4	9(0.77)	8.1
Bull		25(0.6)	19.2	--	--
West Fork		28(1.4)	18.8	23(4.2)	10.3
Whitetail		33(0.4)	22.2	--	--
Windfall		27(0.85)	14.5	--	--
Totals		180(6.4)		78(4.5)	

Cutthroat Trout Alder Creek		Summer 96	
Tributary	Reach	N±(SE)	#/100m2
Mainstem	1	3	0.5
	2	0	0.0
	3	3	0.9
	4	1	0.3
	5	14(0.5)	2.1
	6	6	1.8
	7	21	2.7
	8	2	0.5
	9	1	0.2
North Fork	1	0	0.0
	2	0	0.0
	3	0	0.0
	4	2	2.7
Totals		53(0.5)	

Population estimates were not completed for Evans Creek or Alder Creek in 1996.

Table 3.22 Cutthroat trout abundance and distribution, 1997.

Lake Creek		Summer 97		Fall 97	
Tributary	Reach	N±(SE)	#/100m2	N±(SE)	#/100m2
Mainstem	1	0.0	0.0	2.0	1.8
	2	--	--	--	--
	3	--	--	--	--
	4	8.0	2.1	14(1.4)	3.7
	5	2.0	0.5	8.0	1.9
	6	3.0	0.4	8.0	1.4
	7	0.0	0.0	3.0	1.1
	8	0.0	0.0	20.0	9.0
Bozard		36(2.1)	12.1	78(1.7)	32.3
West Fork		14.0	4.7	93(3.6)	19.3
Totals		63(2.1)		224(6.7)	

Evans Creek		Summer 97		Fall 97	
Tributary	Reach	N±(SE)	#/100m2	N±(SE)	#/100m2
Mainstem	1	0	0.0	0	0.0
	2	6(1.0)	1.1	7	1.4
	3	2	1.0	7	1.9
	4	32(0.6)	6.6	68(6.8)	9.1
	5	26(1.4)	7.8	23(3.2)	5.4
	6	23(1.9)	8.3	30(3.3)	20.2
	7	30(0.9)	12.4	12(4.2)	25.8
E.F.Evans		5(1.0)	2.2	22(0.6)	29.6
R.F.Evans		--	--	21(5.1)	32.3
S.F.Evans		12(0.6)	7.2	26(3.0)	10.8
Totals		136(3.0)		216(11.0)	

Benewah Creek		Summer 97		Fall 97	
Tributary	Reach	N±(SE)	#/100m2	N±(SE)	#/100m2
Mainstem	1	0	0.0	0	0.0
	2	0	0.0	6	0.9
	3	1	0.2	19(0.69)	3.8
	4	0	0.0	2	0.5
	5	3	0.8	1	0.5
	8	0	0.0	2	0.4
	9	8	2.2	6	1.5
	10	3	2.7	4	1.1
	11	4	1.1	0	0.0
South Fork		1	0.5	13(1.41)	7.8
Bull		16(5.94)	8.6	18(1.43)	17.6
Coon		23(1.72)	11.8	51	34.3
School House		8(0.77)	6.6	6	5.4
West Fork		13(0.49)	10.0	48(1.26)	43.1
Whitetail		6.0	5.9	17	5.1
Windfall		20(0.73)	10.8	79(3.4)	42.5
Totals		106(2.7)		272(4.2)	

Alder Creek		Summer 97		Fall 97	
Tributary	Reach	N±(SE)	#/100m2	N±(SE)	#/100m2
Mainstem	1	3	0.5	1	0.1
	2	1	0.3	0	0.0
	3	3	0.8	0	0.0
	4	--	--	42(3.4)	10.8
	5	6	1.0	13	1.7
	6	3	1.6	0	0.0
	7	17	1.8	15(1.7)	1.3
	8	5	1.8	2	0.5
	9	11(2.9)	4.2	1	0.2
N.F.Alder	1	0	0.0	0	0.0
	2	0	0.0	0	0.0
	3	0	0.0	0	0.0
	4	0	0.0	0	0.0
Totals		49(2.9)		74(3.7)	

Table 3.23 Age frequency of cutthroat trout comparing summer and fall shocking results, 1997.

		AGE						
SEASON	**LOCATION**	**0**	**1**	**2**	**3**	**4**	**5**	**TOTAL**
SUMMER	ALDER	4	4	24	14	2		48
	BENEWAH		14	5	2			21
	BOZARD		10	4	9			23
	BULL		9	3	1			13
	COON	1	5	9	2	1	4	22
	E.F. BOZARD		7		4			11
	E.F.EVANS	2	3					5
	EVANS	2	26	43	38	7	1	117
	LAKE				10	3		13
	S.F.EVANS	1	4	7				12
	SCHOOL HOUSE		2	5	1			8
	W.F. BENEWAH		5	6	2			13
	W.F. LAKE		5	2	3	3	1	14
	WHITETAIL		5	1				6
	WINDFALL	4	14		2			20
Summer Total		14	113	109	88	16	6	346
FALL	ALDER	7	21	19	17	6		70
	BENEWAH		7	34	8	3		52
	BOZARD	27	13	8	7			55
	BULL	10	1	5	1			17
	COON	23	12	13	3			51
	E.F. BOZARD	1	8	7	5			21
	E.F.EVANS	14	1	7				22
	EVANS	11	25	51	24	13	9	133
	LAKE	1	11	7	14	13	8	54
	RAINBOW F.EVANS		6	8	3			17
	S.F.EVANS	1	13	5	4	1		24
	SCHOOL HOUSE			2	4			6
	W.F. BENEWAH	32	5	6	4			47
	W.F. LAKE	50	20	8	9	1	1	89
	WHITETAIL	5	2	7	3			17
	WINDFALL	52	17	6				75
Fall Total		234	162	193	106	37	18	750
Grand Total		248	275	302	194	53	24	1096

Table 3.24 Brook trout abundance and distribution in Benewah Creek and Alder Creek, summer 1997.

Benewah Creek				Alder Creek			
Tributary	Reach	N±(SE)	#/100m2	Tributary	Reach	N±(SE)	#/100m2
Mainstem	1	0	0.0	Mainstem	1	2	0.3
	2	0	0.0		2	1	0.3
	3	0	0.0		3	1	0.3
	4	0	0.0		4	--	--
	5	0	0.0		5	6	1.0
	8	0	0.0		6	8(2.9)	4.3
	9	0	0.0		7	42(3.6)	4.4
	10	2	1.8		8	22(3.1)	7.9
	11	2	0.5		9	27(1.1)	10.4
South Fork		2	1.0	N.F.Alder	1	45(5.7)	10.5
Bull		0	0.0		2	37(4.0)	15.3
Coon		0.0	0.0		3	44(5.1)	18.2
School House		0.0	0.0		4	9(2.1)	6.9
West Fork		5(1.5)	3.8	Totals		244(10.5)	
Whitetail		0	0.0				
Windfall		0	0.0				
Totals		11(1.5)					

Table 3.25. Mean back calculated lengths (mm) at age for cutthroat trout, 1996.

Location	**Age**							
	1+	**2+**	**3+**	**4+**	**5+**	**6+**	**7+**	**8+**
Alder	83	118	148	192				
Benewah	83	121	158	207	250	299	318	
Cherry	86	135	176	214	256	298		
Evans	84	124	163	207				
Lake	85	131	171	222	264	308	335	366

A total of 139 brook trout scales were examined for age and growth in 1996 and an additional 51 scales were examined in 1997. The growth potential for brook trout in Alder Creek and Benewah Creek is similar (Table 3.26). Record size for Alder Creek brook trout is 13.4 inches (340 mm TL) and 0.7 pounds (306 grams), caught in 1997. Record size for Benewah Creek is 14.9 inches (380 mm TL) and 1.5 pounds (700 grams). Brook trout have not been identified in the Lake Creek or Evans Creek watersheds. Complete tabular analyses of growth for brook trout are provided in Appendix C.

Table 3.26. Mean back calculated lengths (mm) at age for brook trout, 1996.

Location	**Age**				
	1+	**2+**	**3+**	**4+**	**5+**
Alder	84	120	151	198	227
Benewah	88	127	166	215	268

The linear regressions of body length versus age for cutthroat trout and brook trout are shown in figures 3.9 and 3.10. For the subject watersheds, between 75 and 96 percent of the total variation in body length is explained by age.

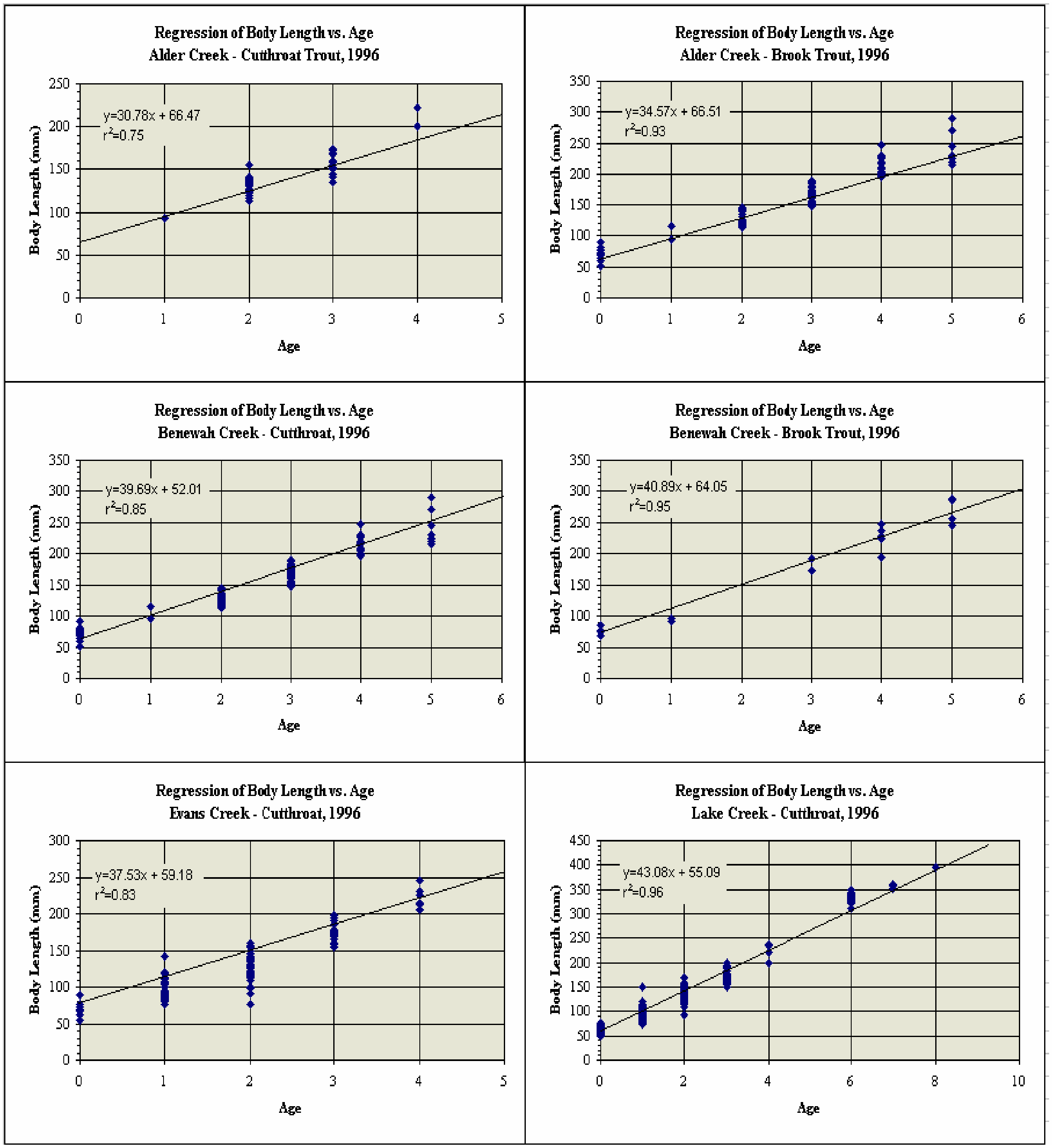


Figure 3.9 Regression equations of body length versus age for cutthroat and brook trout in the target watersheds, 1996.

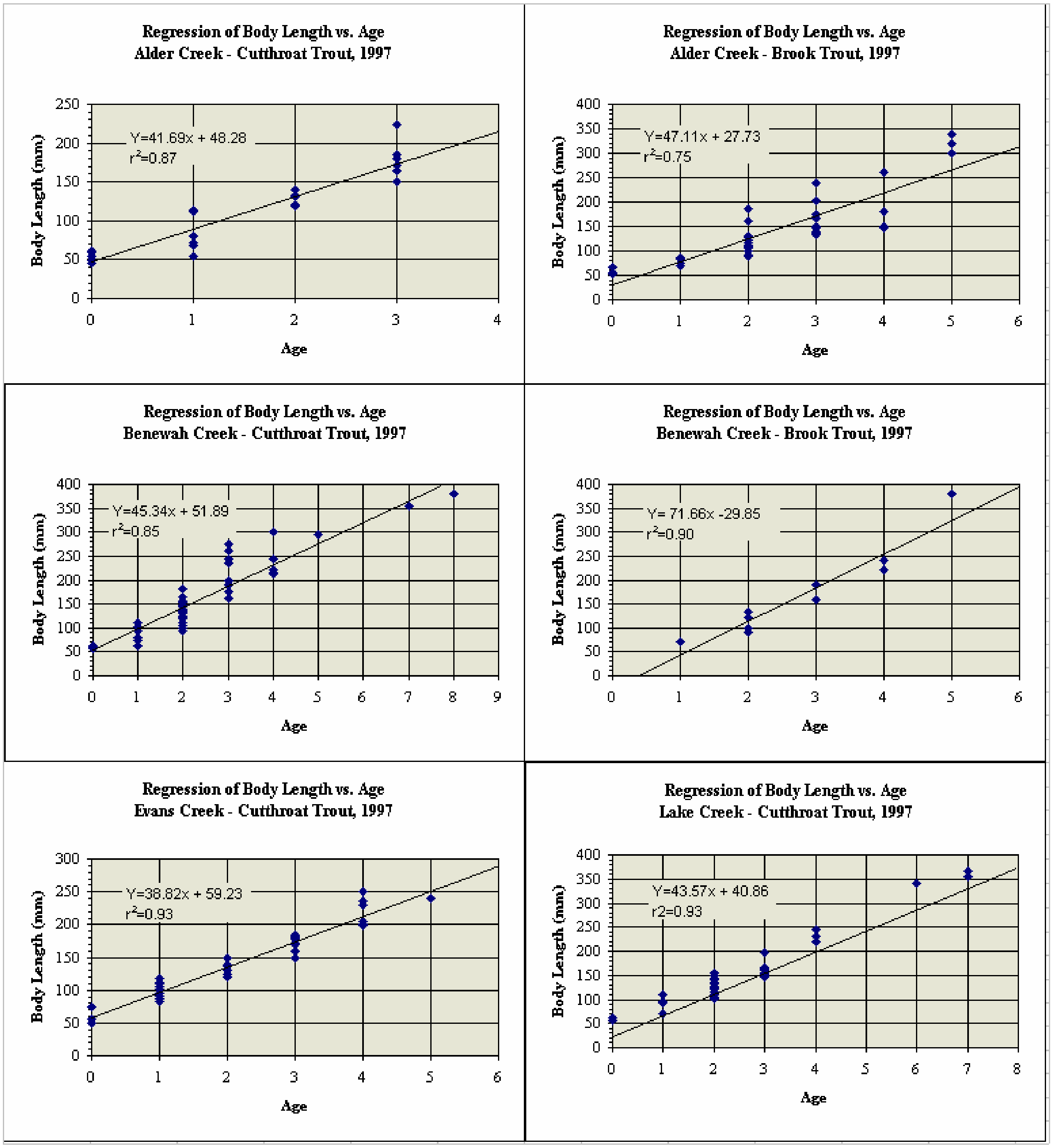


Figure 3.10 Regression equations of body length versus age for cutthroat and brook trout in the target watersheds, 1997.

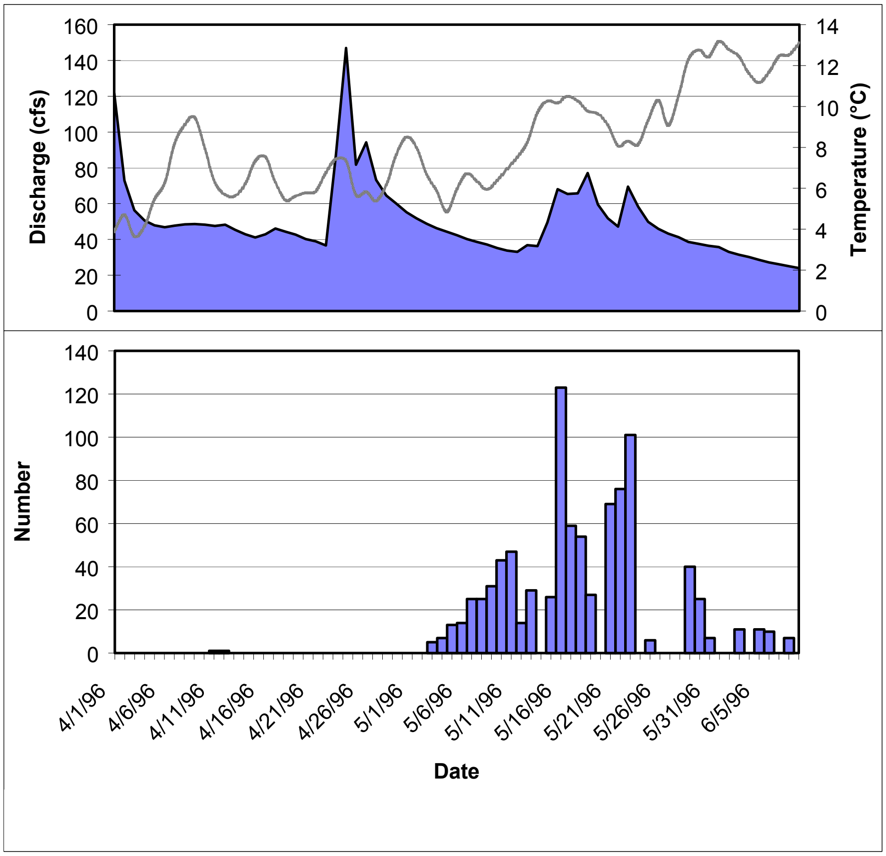
Trout Migration
A total of 907 cutthroat trout were caught in the lower Lake Creek trap in 1996, while only 273 were caught in 1997 (Figure 3.11-3.12). Adult fish (age IV or older) accounted for 3 percent of the catch each year (Figure 3.11-3.12). Although total numbers varied considerably among years, catch per unit effort was similar (12.4 fish/day and 7.8 fish/day, respectively). Measured stream flows in excess of 150 cubic feet/second during the period April 16-30, 1997 reduced the effectiveness of trapping efforts and, in part, account for the lower numbers of trout during that year.

Trapping success in Benewah Creek for the years 1996-97 was considerably lower than in Lake Creek. Only one cutthroat trout was caught in 1996 (0.04 fish/day) while a total of 26 were caught in 1997 (0.7 fish/day). Adult fish (age IV or older) accounted for 27 percent of the catch in 1997. Above normal precipitation and runoff greatly reduced the effectiveness of trapping efforts.

Upstream migration of adult fish into Benewah Creek and Lake Creek was documented for the period March 6 through April 20, 1997. Average daily water temperature in Lake Creek increased from 1° C to 8° C (mean = 3.8° C) during the documented period of upstream migration and stream discharge ranged from 57 cfs to 784 cfs. Measurements of suspended sediment indicated that concentrations rarely exceeded 1,000 mg/L during the migratory period for cutthroat trout in Lake Creek (Bauer, 1998). These concentrations are considerably lower than those reported to cause avoidance in migrating salmonids (Cordone and Kelley 1961, Bell 1986). Residence time for adults in both watersheds varied from 21 to 47 days, based on mark-recapture data (n=7) and radio telemetry data (n=1). Observed variation is likely a result of several factors, including spawning site selection and the availability of suitable spawning partners, as well as natural changes in flow, temperature, and turbidity.

The adaptation to migration in Coeur d'Alene basin westslope cutthroat trout appears to be more closely related to size rather than age. This has also been reported for coastal cutthroat (Johnson, 1982). Outmigrant behavior is observed predominantly in age II fish, with more than 70 percent of juvenile outmigrants consisting of age II cutthroat trout (Figures 3.11 and 3.12). These fish range in size from 9 to 54 grams and are 120 to 162 mm long. More than 70 percent of these fish are greater than 18 grams and 125mm long. Migration by smaller fish has been observed, however, mortality both from predation and physical damage probably increases with decreasing size and weight. The smallest migrating cutthroats weigh from 8 to 18 grams and are 90 to 119 mm long. It is postulated that frequent rain on snow events during early spring may be partially responsible for displacing higher proportions of age I fish, as was observed in Lake Creek in 1996.

Smolt movement to Lake Coeur d'Alene begins in late April to early May and is completed by mid-June. Peak outmigration is often correlated with small spikes in the hydrograph (Figures 3.11 and 3.12). Daily fluctuations in water temperature may also affect downstream migration. For example, downstream movement into traps has been shown to increase during the night when daytime water temperatures rise above 16°C (George Aripa, personal communication). Upstream migration into small tributaries by juvenile cutthroat was documented to occur as late as mid May in the Benewah Creek watershed. These migrants may be resident forms that were displaced from preferred habitat during spring runoff. Alternatively, the onset of increasing temperatures in the mainstem may elicit a migratory response in resident fish.



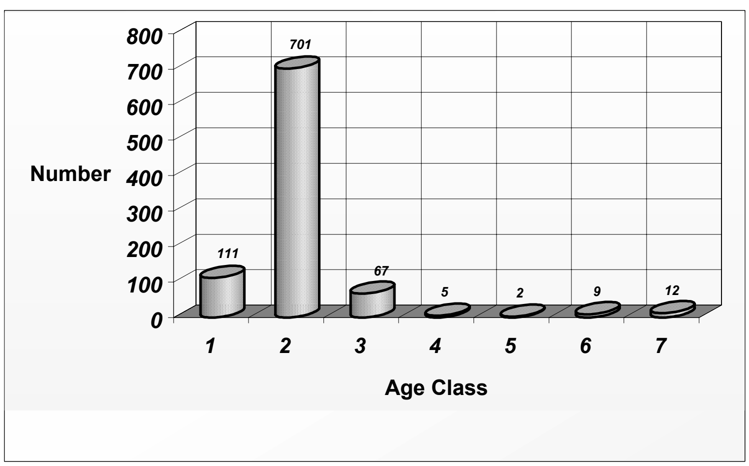


Figure 3.11 Analysis of cutthroat trout migration showing migration timing versus discharge and water temperature and age frequency of migrants in Lake Creek, 1996.

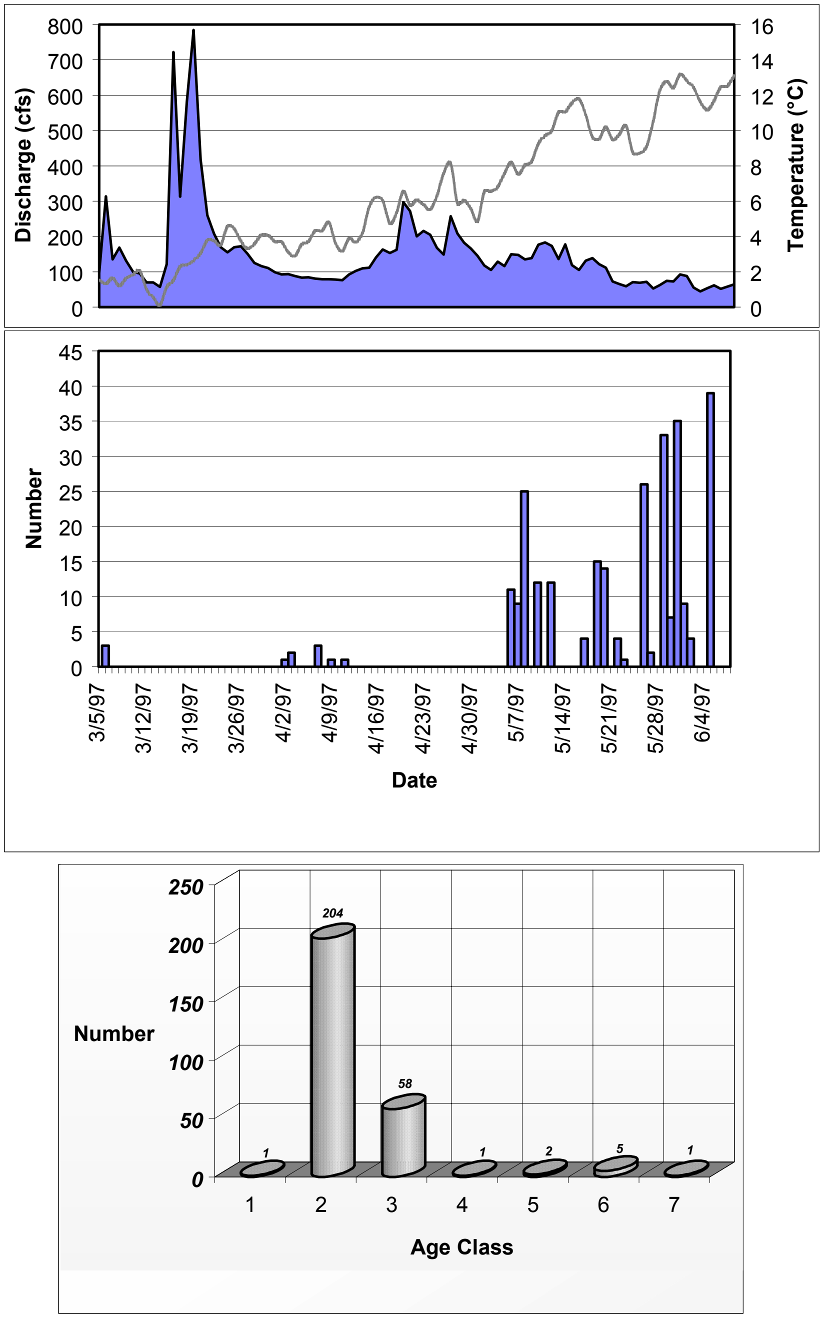


Figure 3.12 Analysis of cutthroat trout migration showing migration timing versus discharge and water temperature and age frequency of migrants in Lake Creek, 1997.

4.0 Discussion

4.1 Limiting Factors

Lake Studies
Water quality monitoring was completed on Coeur d'Alene Lake in order to assess its effect on cutthroat trout production. Earlier work has shown (Funk *et. al*., 1973 and 1975; Horowitz *et. al*., 1994 and Woods and Beckwith, 1995) that impacts from many different sources have caused a general decline in the water quality in Coeur d'Alene Lake. This, in turn, has had a detrimental effect on the cutthroat trout population in the lake. There is some evidence that the water quality may be improving (Woods, 1994) however, the possible legacy effects have yet to be determined.

Water Quality monitoring was completed at thirteen sites on Coeur d'Alene Lake. Multiple physical/chemical parameters were looked at in 1997. Of the parameters looked at it appears that only temperature is directly influencing the distribution of cutthroat trout in the lake. Dissolved oxygen, pH, conductivity, turbidity, total suspended solids, and dissolved heavy metals appeared to be within acceptable levels for cutthroat trout survival. Dissolved oxygen and suspended sediments though not directly impairing cutthroat suitability does affect overall water quality and impairs some use by cutthroat trout.

Low quantities of dissolved oxygen did occur at some of the sample sites, however, it is not considered limiting for cutthroat trout suitability. Low dissolved oxygen, however, is thought to have indirect affects on cutthroat trout suitability in the southern lakes area. Low dissolved oxygen values most likely are occurring from decomposition of organic matter from allochthonous sources as well as from aquatic macrophytes. Reiman (1980) and Woods (1989) noted hypolimnetic oxygen deficits in Coeur d'Alene Lake in 1979 and 1987 as well.

Increased loading of sediments from agricultural runoff does affect cutthroat suitability, though not directly, in areas near the mouths of streams in and around the lake. Sediment is accumulating at the mouth of Plummer creek in Chatcolet Lake at a rate of 2.4 cm/year (Breithaupt, 1990). This, in turn, increases the surface area where large masses of aquatic macrophytes can grow. These masses of aquatic plants can impair juvenile and adult migrations and serve as the primary foraging areas for larger piscivorous fishes.

The deposition of trace elements in the sediments of Coeur d'Alene Lake is well documented (Funk, 1973; Reiman 1980, Woods, 1989). Measured levels of dissolved metals did not appear to be directly affecting cutthroat suitability in Coeur d'Alene Lake. However, when coupled with increases in hypolimnetic oxygen deficits the potential for release of large quantities of the trace heavy metals becomes a real possibility. Currently, the principle means of controlling the levels of dissolved heavy metals in the waters of Coeur d'Alene Lake is keeping them bound up in the sediments of the lakebed. This means that managing the nutrient and sediment income in order to curtail the development of anaerobic conditions that would facilitate the release of these metals from the sediments is of paramount importance.

Nutrient and $chlorophyll_a$ levels did not appear to be significantly high when compared to values reported by Woods and Beckwith (1995) in 1991 and 1992. Analysis of the species composition of the algae by Woods and Beckwith in 1991 and 1992 showed very few, if any, species which would indicate a problem with eutrophication or a trend towards a change in trophic status in the main parts of Coeur d'Alene Lake. However, the presence of some blue-green algae in the southern lakes sample stations indicates that there is a change in trophic status towards eutrophic as you move along a southerly axis in the lake. This would most likely have a detrimental effect on the distribution of cutthroat trout in those areas. Also, large masses of aquatic macrophytes are present in the southern chain lakes area which, in all probability, are utilizing large quantities of the available nutrients and keeping chlorophyll values lower than they would normally be with the same amount of nutrients. Breithaupt (1990) completed work in Chatcolet Lake that showed the highest peaks of total phosphorous occurred shortly after peak runoff, however, these events were not accompanied by corresponding changes in algae biomass.

Trophic state indices calculated in 1975 (U.S. EPA, 1977) classified Coeur d'Alene Lake as mesotrophic lakewide. Data collected in 1989 (Breithaupt, 1990) classified the southern lakes area as eutrophic during the peak runoff period and mesotrophic for the other times of the year. Woods (1994) classified Coeur d'Alene Lake as oligotrophic for all parameters except secchi disk transparency, which classified the lake as mesotrophic. Our data classified the lake as oligotrophic in the north and meso-eutrophic in the south with water quality parameters associated with eutrophic conditions increasing in a southerly direction.

Changes in the trophic state of the lake can also have dramatic effects on the succession of fish species within a lake. Hayward and Margraf (1987) showed rapid successional changes in the species structure of fish as a result of trophic status changes in Lake Erie. Leach *et al.* (1977) showed successional changes in response to trophic status changes, but at a much slower rate. As a lake becomes more oligotrophic following clean up or restoration it can be expected that some change in the fish species abundance will occur. Some species will be able to take advantage of changing conditions, while others will not. It is not surprising that salmonid populations have declined as a result of the eutrophication of Coeur d'Alene Lake from 1950-1970's. However, evidence suggests that in some portions of the lake this process may be reversing itself and slowly going towards oligotrophy again. This may mean that conditions which favored salmonid populations historically may return, however, the successional changes may not mirror the response to eutrophication. For example, other authors have shown that once cutthroat trout are replaced by another salmonid species (i.e. kokanee salmon), it is unlikely that space will be regained by cutthroat trout under natural conditions (Moyle and Vondracek, 1985).

Based on the water quality HSI's calculated for cutthroat trout, the upper 10 meters of the water column generally is not suitable habitat. At only one location was the HSI value higher than 0.0. This does not mean that cutthroat trout will not be found there, but they will have trouble sustaining themselves over a long period of time. Furthermore, the euphotic zone rarely drops below 10 meters so any foraging runs into that zone will take them into unsuitable habitat, which results in added stress. Thus, all areas represented by sample stations less than ten meters in depth would be considered unsuitable cutthroat trout habitat with deeper stations showing limited distribution during certain times of the year.

It does appear that improvements in the water quality of Coeur d'Alene Lake are occurring, however, water quality is still having a detrimental effect on habitat suitability for cutthroat trout. In addition to the direct affects of temperature, indirect effects related to low dissolved oxygen concentrations, total suspended solids, and large masses of aquatic macrophytes effectively limit the cutthroat trout population in the areas where these conditions exist. Specifically, these areas include the sample locations most affected by construction of Post Falls Dam; the two shallow stations, the three southern chain lake stations, and the three interior bay stations.

Fisheries

There is no doubt that inter-specific species competition occurs between cutthroat trout and other fish species, especially the introduced ones (Griffith 1974,1988; Marnell 1986, 1987, 1988; and others). Two mechanisms are controlling the population of cutthroat trout competitive exclusion and species replacement due to rapid changes in the environmental conditions within the lake. The extent that each individual mechanism controls the population has yet to be worked out. However, the fact that the adfluvial population has not been extirpated from the lake shows that these fish have some resiliency to the detrimental effects from interactions with the introduced species. Petroskey and Bjornn (1985) demonstrated that cutthroat in the St. Joe River system show little detrimental effects from the introduction of hatchery reared rainbow trout. Griffith (1988) postulated that this resiliency may be attributed to the fact the cutthroat trout are not existing in habitat that is optimal for them but existing in habitat that is sub-optimal for the other species.

It is thought that juvenile cutthroat trout spend some time in the littoral zone just after they enter the lake from the tributaries where they would be subject to predation by these larger piscivorous fishes. It can be expected that some mortality will occur during this life stage. Insufficient data has been collected to determine exactly what effect this life stage mortality has on the overall population dynamics of the cutthroat trout in Coeur d'Alene Lake.

Of the introduced species the following have been shown to have the ability to actively feed on other fish species including adult and juvenile cutthroat trout: northern pike, largemouth bass, smallmouth bass, chinook salmon, and channel catfish. Historically, bull trout and northern squawfish were the only predators of cutthroat trout in the lake. Electrofishing data shows that these predators are associated primarily with the shoreline littoral zone. The relative abundance data shows that five species of piscivorous fishes (four introduced) have relative abundances higher than cutthroat trout. This would indicate that cutthroat trout are probably being competitively excluded from this littoral zone habitat by these other fishes.

Historically, cutthroat trout in Coeur d'Alene Lake probably utilized the littoral zone of the lake until they were large enough to move offshore and feed, most likely, on mid water prey and fish when available. Nilsson and Northcote (1981) noted that cutthroat trout in allopatry with other salmonids were found throughout the lake and in sympatry, they were located primarily in the littoral zone. It has been shown that introduction of kokanee salmon will also have detrimental effects on the cutthroat trout population (Gerstung, 1988; Marnell, 1988). Marnell (1988) determined that declines in westslope cutthroat trout populations in lakes in Glacier National Park where kokanee were introduced were caused by competition for planktivorous food. Thus, the introduction of non-native species into Coeur d'Alene Lake, at the minimum, altered the normal behavioral pattern of the cutthroat trout in both the littoral and limnetic zones of Coeur d'Alene Lake.

Based on the relative abundance information from 1994-1997 it appears that cutthroat trout are more successful in the limnetic zone than the littoral zone. In the limnetic zones with depths greater than 10 meters cutthroat trout were the third most abundant fish species caught. In the littoral zones of these same areas cutthroat trout were one of the least abundant species caught. Introduced species made up over 68% of the catch in relative abundance studies from 1994-1997 while cutthroat trout comprised less than 1% of the catch. In the littoral zones problems associated with temperature and inter-specific interactions are maximized. In the limnetic zone there is some relief from the effects of temperature however, problems associated with introduced species still exist. In relative abundance studies completed in the limnetic zones greater than ten meters deep from 1994-1997 introduced species (kokanee salmon) made up only 32% of the catch. There appears to be some association with the locations where cutthroat trout are caught in both the littoral and limnetic zones. It appears that in areas where fish are found in the limnetic zones they are also found in the littoral zones located nearby. This could mean that these fish are avoiding high temperatures in the upper waters by making foraging runs into the littoral zones during times when the water temperatures cool slightly at night. This could also be a predator avoidance mechanism as well.

Stream Studies

Peak flows in Lake Creek and Benewah Creek have been identified in previous reports as a potential limiting factor for trout production (Lillengreen 1996). Generally, increased flows during egg incubation will be favorable until they reach the point when scouring and other flood damage may take place (Allen 1969). Spikes in stream discharge during the early spring, as is characteristic of the Lake Creek and Benewah Creek watersheds, may cause redd scouring and egg damage, although no attempt has been made to quantify this source of mortality. For example, stream flows in upper Lake Creek during spring of 1997 exceeded the sheer stress of spawning gravels (5 cm geometric mean particle diameter) for 4 consecutive days during the incubation period. It is conceivable that flow events of this magnitude could scour trout redds and result in complete year class failures. Although flood damage is a natural source of mortality, canopy reduction in each of the target watersheds has probably contributed to higher storm runoff peaks. Scouring of trout redds is certainly a more frequent occurrence than in the recent past.

Habitat availability in the target watersheds is not likely to be limiting for fry life stages. It has been demonstrated that young-of-the year cutthroat trout are conspicuous inhabitants of slow-water areas near the margins of streams. Low velocity and low flow characterize these habitats. Moore and Gregory (1988) studied Cascade mountain streams and found that only about 35% of the total number of fry were observed at velocities greater than 1 cm/second, and no fry were observed at velocities greater than 15 cm/second. Focal depth for these fish increased rapidly from mid-August to early September, but the average depth was always less than 35 cm. Griffith (1972) reported similar focal points for cutthroat trout in north Idaho streams. These preferences of fry for depth and velocity are easily met during base flow conditions in the target tributaries.

This report demonstrates that abundance of juvenile cutthroat is greatest in first and second order tributaries, suggesting a close link to the most heavily utilized spawning areas. Downstream displacement, however, has been recognized as a common occurrence when stream flows approach zero in the principle spawning tributaries. While not being unique, this mechanism has not been commonly reported for most salmonid populations in the Pacific Northwest. For most salmonid species, it has been demonstrated that instream movement is minimal; individuals may remain in limited areas for several weeks or months and may return to the same locations in successive years (Edmundson et al. 1968; Bachman 1984). Limiting migration in this way is thought to confer an adaptive advantage by maximizing the net energy intake of individuals (Puckett and Dill 1985).

Typical base flow conditions in the target watersheds force juvenile trout into small pools where competition for limited space and food may occur. Other authors have suggested that at high densities, competition for space among juveniles may lead to dispersal, downstream displacement or mortality in salmonids (Chapman 1962; Mason and Chapman 1965; Everest 1971; Erman and Leidy 1975; LeCren 1973). In water quality limited systems, such as Lake Creek, Benewah Creek, and Alder Creek, dispersal to downstream areas exposes juvenile cutthroat to suboptimal temperature conditions that increase stress, weaken individuals and may result in mortality.

Cutthroat trout did not evolve with brook trout in the Benewah Creek and Alder Creek watersheds. Therefore, mechanisms that promote coexistence and resource partitioning have likely not developed. Griffith (1972) demonstrated that cutthroat trout fry emerge from the gravel later in the year than brook trout and, thus, age-0 cutthroat trout acquire a statistically significant length disadvantage that may continue throughout their lifetime. Such a size discrepancy may enhance resource partitioning, but in times of habitat shortage cutthroat trout may be at a disadvantage if they cannot hold territories against larger competitors. Competitive exclusion is a likely cause of decline for cutthroat trout in Alder Creek. Replacement of this kind, at least in stream environments, may be an irreversible process (Moyle and Vondracek 1985). This was found to be the case in Yellowstone National Park, where the introduction of brook trout has nearly always resulted in the disappearance of the cutthroat trout (Varley and Gresswell

1988). Implications for Benewah Creek are that cutthroat trout may have a difficult time recovering given continued water quality degradation and the persistence of brook trout.

Anecdotal evidence cited by residents (Ness personal communication; Hodgson personal communication) suggests that historic base flows in Lake Creek and Benewah Creek were often much lower than those considered optimal for trout production (Hickman and Raleigh, 1982; Binns and Eiserman 1979). This is most likely true for Alder Creek as well. This is not surprising considering the relatively small sizes of the target watersheds, the elevations, and the regional climate (Table 1.1). It is conceivable that base flow conditions provided the selective pressure that encouraged genetic differentiation of adfluvial stocks in the Coeur d'Alene basin.

In addition, much of the conversion of forested land to agricultural or pasture land, and removal of riparian canopy occurred prior to 1950. This suggests that stream temperatures have played a part in limiting cutthroat trout abundance and distribution within the target watersheds for at least 50 years. The range of suitable summer rearing habitat for cutthroat trout in each target watershed is significantly reduced when compared with the historic range of these fish. HSI calculations published in this report, however, indicate that improving habitat condition through restoration and protection has the potential to partially compensate for short-term degradation in water quality. In considering this information, it appears that the native strains of westslope cutthroat trout are adapted to local conditions and display a high degree of resiliency.

4.2 Supplementation Feasibility

Need For Supplementation

Due to the persistence of adverse conditions in natal streams and Coeur d'Alene Lake, cutthroat trout populations are thought to be at least moderately damaged (i.e. average spawning escapements fall between the minimum viable population and the number of adults needed to produce 50% of the carrying capacity of the stream environment). The following factors effectively limit the population of cutthroat trout in natal streams and in Coeur d'Alene Lake:

- Stochastic events that result in increased mortality of embryo, fry, and juvenile lifestages (e.g. peak flow events) have been exacerbated by land use practices during the last 60 years;
- Competition for limited space and food during base flow conditions cause displacement of juveniles into water quality limited stream reaches;
- Competitive interactions with introduced salmonids may result in replacement of native trout in Alder Creek and Benewah Creek;
- Water temperatures in the upper ten meters of the water column in Coeur d'Alene Lake exceed the optimum as described in the HSI for cutthroat trout;
- Sediment loading from tributaries in combination with large quantities of aquatic macrophyte growth and low dissolved oxygen concentrations in the hypolimnion promote conditions more favorable for introduced fish species in the lake; and
- Competitive interactions with introduced species for food, living space, and through predation limit cutthroat trout in both the littoral and limnetic zones of Coeur d'Alene Lake.

These conclusions are supported by work that was conducted previously by other investigators, as well as, work conducted by the Coeur d'Alene Tribe Fish/Water/Wildlife Program. Based on the analysis of these limiting factors, gains from habitat restoration and protection alone will not achieve the goals set forth by the Coeur d'Alene Tribal Council to provide for self-sustaining populations and harvestable numbers of cutthroat trout.

Definition

For the purposes of this document, supplementation is defined as the stocking of fish into the natural habitat to increase the abundance of naturally reproducing fish populations. Maintaining the long-term genetic fitness of the target population, while keeping the ecological and genetic impacts on non-target populations within acceptable limits, is inherent in this working definition.

On the Coeur d'Alene Indian Reservation, supplementation activities would involve stocking fish into habitats that contain depressed but existing natural fish populations. Unlike many traditional hatchery programs, the objective of supplementation here is to increase the abundance of a naturally reproducing fish populations and therefore, is oriented toward maintaining the natural biological characteristics of the population and reliance on the rearing capabilities of the natural habitat. Supplementation measures will not obviate the need to concurrently pursue other necessary actions such as habitat protection and improvement, and harvest management to rebuild stocks.

Proposed Use of Supplementation

The objective of supplementation will be to boost the population density above a certain minimum viable population size as quickly as possible. Minimum viable spawning escapement size for each stock will be calculated from the minimum effective breeding number by a transfer function, whose elements include the amount of spawning and rearing habitat available and the average total mortality. These values are currently under investigation and will be needed to develop an initial management strategy. The concept is to employ a supplementation program to a level that minimizes the risk of extirpation.

The primary role of supplementation in this case is to increase the survival rate of the population during its early life history (egg through smolt) relative to its survival rate under natural conditions. It is anticipated that this effort will result in increased adult returns to seed sparsely populated habitats and provide for limited harvest opportunities.

For depressed stocks that exist in tributaries of Coeur d'Alene Lake, the question of how many or what proportion of the natural stock to intercept for broodstock can only be resolved by careful evaluation of the impact of initially taking a small fraction of the depressed population for broodstock. An important consideration will be to ensure that capture of broodstock does not reduce the number of naturally spawning adults required to maintain the minimum viable population.

Approach To Supplementation

Supplementation has been a common strategy for increasing natural fish production in the Columbia River Basin. However, there is not yet a detailed understanding of which techniques work best under which circumstances (Cuenco, et. al. 1993). A phased implementation and adaptive management approach will be used to identify uncertainties and design experiments to facilitate the development of construction alternatives. A flow chart identifying critical implementation steps and unmet needs has been developed (Figure 4.1). Three distinct levels comprise this phased approach. Level I identifies the need for supplementation through limiting factor analysis and projections of stock status. This report completes the level I tasks and describes the purpose and need for supplementation.

Level II is a comprehensive stock analysis with the ultimate purpose of developing production goals that will maintain the minimum viable population, while providing for some harvest opportunities. Information gained through genetic analysis, habitat quantification, and estimates of average total mortality throughout the lifecycle will determine minimum viable populations for the target watersheds. Several critical questions must be answered to determine overall production goals. First, does sufficient natural habitat exist, capable of supporting a viable, self-perpetuating population in the face of natural stochastic events (e.g., floods, droughts, etc.) demographic factors (e.g., ability to find a mate, sex ratio, age structure), and genetic considerations (prevent loss of genetic variation). This is important to ensure that the carrying capacity of the habitat does not become a limiting factor in population recovery. Secondly, are suitable stocks available for supplementation. To maximize the chances of success, indigenous stocks should be used for broodstock in their own enhancement program. This will ensure that important biological traits, such as spawning, incubation, and emergence timing are synchronized with favorable environmental conditions. Finally, are sufficient numbers of spawning adults available for maintenance of the minimum viable population and subsequent supplementation needs, which will provide for desired levels of harvest.

Level III outlines interim steps from master plan development to hatchery construction and implementation of the supplementation program. Information from the stock analysis will be used to develop a master plan that will identify supplementation strategies, project future harvest returns, provide a cost-benefit analysis, locate an appropriate construction site, and address the requirements of the National Environmental Policy Act (NEPA) for hatchery construction. Ongoing habitat restoration and protection will provide for increases in carrying capacity that will facilitate this phased implementation approach.

The concept of supplementation is still relatively new and uncertainties still exist about its effectiveness and safety. Monitoring and evaluation will be used to assess the performance and degree of success for each supplemented stock. The results will be used to guide other proposed supplementation projects. The following elements will be included in the monitoring and evaluation program: clearly defined, quantifiable objectives; performance measures for each objective; an experimental design which will facilitate the decision making process by allowing for adaptive management.

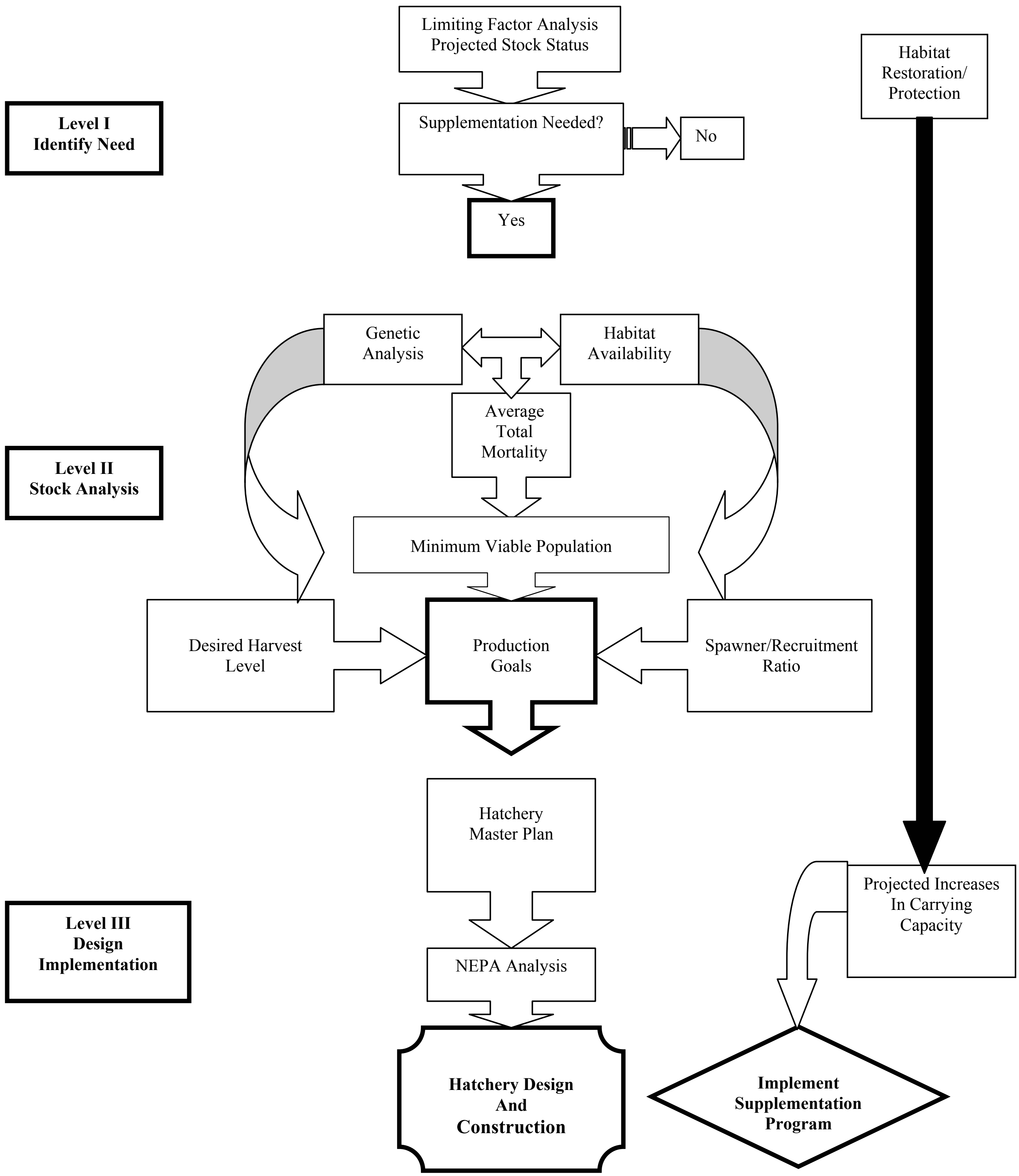


Figure 4.1 Supplementation flow chart.

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Appendix A

Vertical hydrolab profiles of thirteen stations on Coeur d'Alene Lake, 1997.

Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
Rockford Bay	1597	ASSS	4/18/97	-	1.7	11	0.4	12.58	5.64	7.34	42.4	0.03	*****	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	10	1.3	12.51	5.42	7.33	42.2	0.03	99	-	373
Rockford Bay	1597	ASSS	4/18/97	-	1.7	9	2.6	12.54	5.24	7.34	41.9	0.03	98.8	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	8	4	12.48	4.98	7.32	41.6	0.03	97.6	-	373
Rockford Bay	1597	ASSS	4/18/97	-	1.7	7	5.4	12.5	4.94	7.31	41.8	0.03	97.7	-	373
Rockford Bay	1597	ASSS	4/18/97	-	1.7	6	6.7	12.47	4.87	7.31	42.5	0.03	97.3	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	5	7.8	12.47	4.81	7.31	42.7	0.03	97.2	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	4	9	12.48	4.74	7.3	43.2	0.03	97	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	3	10.3	12.47	4.69	7.29	43.2	0.03	96.9	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	2	11.8	12.79	4.65	7.29	43.4	0.03	99.2	-	370
Rockford Bay	1597	ASSS	4/18/97	-	1.7	1	13	12.19	4.61	7.28	43.2	0.03	94.4	-	369
Rockford Bay	1997	DBSS	5/16/97	-	1.3	11	0.2	11.36	13.57	7.09	36.1	0.02	108.4	-	409
Rockford Bay	1997	DBSS	5/16/97	-	1.3	10	2	11.31	10.51	7.09	34.2	0.02	100.6	-	412
Rockford Bay	1997	DBSS	5/16/97	-	1.3	9	3.4	11.39	10.46	7.08	34.7	0.02	101.3	-	412
Rockford Bay	1997	DBSS	5/16/97	-	1.3	8	5	11.54	10.41	7.06	37.4	0.02	102.4	-	413
Rockford Bay	1997	DBSS	5/16/97	-	1.3	7	6.5	11.53	10.22	7.05	37.5	0.02	101.9	-	413
Rockford Bay	1997	DBSS	5/16/97	-	1.3	6	8	11.53	10	7.05	38	0.02	101.3	-	414
Rockford Bay	1997	DBSS	5/16/97	-	1.3	5	9.5	11.49	9.74	7.05	37.6	0.02	100.3	-	413
Rockford Bay	1997	DBSS	5/16/97	-	1.3	4	11	11.43	9.55	7.04	37.6	0.02	99.4	-	413
Rockford Bay	1997	DBSS	5/16/97	-	1.3	3	12.5	11.37	9.32	7.02	38.2	0.02	98.3	-	414
Rockford Bay	1997	DBSS	5/16/97	-	1.3	2	14	11.27	8.83	7.01	38.7	0.02	96.3	-	414
Rockford Bay	1997	DBSS	5/16/97	-	1.3	1	15.4	11.21	7.66	7.01	39.9	0.03	93.1	-	414
Rockford Bay	2197	DBSS	5/29/97	-	1.3	15	0.6	10.57	16.8	6.91	32.1	0.02	108.4	-	387
Rockford Bay	2197	DBSS	5/29/97	-	1.3	14	1.6	10.6	16.43	6.88	32	0.02	107.9	-	388
Rockford Bay	2197	DBSS	5/29/97	-	1.3	13	2.5	10.42	12.02	6.82	32.5	0.02	96.2	-	393
Rockford Bay	2197	DBSS	5/29/97	-	1.3	12	3.5	10.75	11.31	6.76	31	0.02	97.7	-	395

Rockford Bay	2197	DBSS	5/29/97	-	1.3	11	4.6	10.54	10.92	6.73	30.8	0.02	94.8	-	396
Rockford Bay	2197	DBSS	5/29/97	-	1.3	10	5.5	10.49	10.36	6.72	30.4	0.02	93.2	-	396
Rockford Bay	2197	DBSS	5/29/97	-	1.3	9	6.6	10.49	10.18	6.7	30.4	0.02	92.8	-	397
Rockford Bay	2197	DBSS	5/29/97	-	1.3	8	7.6	10.62	9.96	6.69	29	0.02	93.4	-	397
Rockford Bay	2197	DBSS	5/29/97	-	1.3	7	8.7	10.61	9.82	6.66	30.2	0.02	93.1	-	397
Rockford Bay	2197	DBSS	5/29/97	-	1.3	6	9.7	10.63	9.71	6.64	30.2	0.02	93	-	398
Rockford Bay	2197	DBSS	5/29/97	-	1.3	5	10.6	10.62	9.69	6.62	30.4	0.02	92.8	-	398
Rockford Bay	2197	DBSS	5/29/97	-	1.3	4	11.6	10.51	9.64	6.6	31.3	0.02	91.9	-	400
Rockford Bay	2197	DBSS	5/29/97	-	1.3	3	12.6	10.51	9.36	6.57	32	0.02	91.1	-	401
Rockford Bay	2197	DBSS	5/29/97	-	1.3	2	13.6	10.5	9.12	6.53	32.8	0.02	90.5	-	401
Rockford Bay	2197	DBSS	5/29/97	-	1.3	1	14.8	10.53	8.63	6.48	34	0.02	89.7	-	404
Rockford Bay	2397	DBAS	6/11/97	-	1.8	14	0.6	10.87	14.41	7.14	34.4	0.02	106.3	-	414
Rockford Bay	2397	DBAS	6/11/97	-	1.8	13	1.5	11.11	12.51	7.13	33.1	0.02	104.1	-	416
Rockford Bay	2397	DBAS	6/11/97	-	1.8	12	2.5	11.13	12.08	7.13	32.4	0.02	103.1	-	416
Rockford Bay	2397	DBAS	6/11/97	-	1.8	11	3.4	11.09	11.62	7.13	32	0.02	101.8	-	415
Rockford Bay	2397	DBAS	6/11/97	-	1.8	10	4.6	10.9	10.8	7.13	30.9	0.02	98.1	-	416
Rockford Bay	2397	DBAS	6/11/97	-	1.8	9	5.5	10.81	10.41	7.14	30	0.02	96.5	-	415
Rockford Bay	2397	DBAS	6/11/97	-	1.8	8	6.4	10.72	10.33	7.14	29.6	0.02	95.5	-	415
Rockford Bay	2397	DBAS	6/11/97	-	1.8	7	7.6	10.65	10.13	7.14	29.9	0.02	94.4	-	414
Rockford Bay	2397	DBAS	6/11/97	-	1.8	6	8.5	10.69	10.08	7.15	30.1	0.02	94.6	-	414
Rockford Bay	2397	DBAS	6/11/97	-	1.8	5	9.7	10.68	9.97	7.15	30.1	0.02	94.3	-	414
Rockford Bay	2397	DBAS	6/11/97	-	1.8	4	10.6	10.66	9.92	7.16	30	0.02	94.1	-	414
Rockford Bay	2397	DBAS	6/11/97	-	1.8	3	11.7	10.64	9.92	7.18	30	0.02	93.8	-	413
Rockford Bay	2397	DBAS	6/11/97	-	1.8	2	12.6	10.63	9.76	7.19	30.5	0.02	93.4	-	412
Rockford Bay	2397	DBAS	6/11/97	-	1.8	1	13.6	10.2	10.12	7.24	30.5	0.02	90.3	-	411
Rockford Bay	2597	DBSS	6/26/97	-	3.3	14	0.2	10.64	16.29	7.11	33.8	0.02	108.2	-	442
Rockford Bay	2597	DBSS	6/26/97	-	3.3	13	0.9	10.66	16.23	7.1	33.9	0.02	108.3	-	443
Rockford Bay	2597	DBSS	6/26/97	-	3.3	12	1.9	10.66	16.04	7.08	33.8	0.02	107.8	-	444
Rockford Bay	2597	DBSS	6/26/97	-	3.3	11	2.9	10.63	15.71	7.07	33.6	0.02	106.7	-	444
Rockford Bay	2597	DBSS	6/26/97	-	3.3	10	3.9	10.7	15.04	7.05	33.5	0.02	105.9	-	446

Rockford Bay	2597	DBSS	6/26/97	-	3.3	9	4.9	10.78	14.13	7.02	33.1	0.02	104.6	-	447
Rockford Bay	2597	DBSS	6/26/97	-	3.3	8	6	10.78	13.55	7	33.1	0.02	103.3	-	448
Rockford Bay	2597	DBSS	6/26/97	-	3.3	7	7	10.77	13.29	7	32.9	0.02	102.6	-	448
Rockford Bay	2597	DBSS	6/26/97	-	3.3	6	8	10.73	13.09	6.98	32.8	0.02	101.7	-	448
Rockford Bay	2597	DBSS	6/26/97	-	3.3	5	8.9	10.78	12.96	6.96	32.8	0.02	101.9	-	448
Rockford Bay	2597	DBSS	6/26/97	-	3.3	4	10	10.76	12.86	6.94	32.8	0.02	101.5	-	449
Rockford Bay	2597	DBSS	6/26/97	-	3.3	3	11	10.69	12.77	6.91	32.8	0.02	100.7	-	450
Rockford Bay	2597	DBSS	6/26/97	-	3.3	2	12	10.55	12.56	6.87	32.9	0.02	98.9	-	451
Rockford Bay	2597	DBSS	6/26/97	-	3.3	1	12.9	9.92	11.23	6.81	34	0.02	90.1	-	454
Rockford Bay	2797	DBSS	7/9/97	-	4.5	14	0.4	10.09	17.81	7.28	36.2	0.02	*****	-	381
Rockford Bay	2797	DBSS	7/9/97	-	4.5	13	1.2	10.26	16.91	7.27	36.1	0.02	*****	-	381
Rockford Bay	2797	DBSS	7/9/97	-	4.5	12	2.2	10.33	16.58	7.21	36.2	0.02	*****	-	382
Rockford Bay	2797	DBSS	7/9/97	-	4.5	11	3.2	10.35	16.38	7.17	36.1	0.02	*****	-	383
Rockford Bay	2797	DBSS	7/9/97	-	4.5	10	4.2	10.37	15.79	7.15	36.1	0.02	*****	-	383
Rockford Bay	2797	DBSS	7/9/97	-	4.5	9	5.2	10.36	15.4	7.09	35.8	0.02	*****	-	384
Rockford Bay	2797	DBSS	7/9/97	-	4.5	8	6.2	10.3	14.94	7.05	35.7	0.02	*****	-	385
Rockford Bay	2797	DBSS	7/9/97	-	4.5	7	7.2	10.01	13.61	7.02	34.8	0.02	96.9	-	385
Rockford Bay	2797	DBSS	7/9/97	-	4.5	6	8.2	9.88	13.17	7	34.9	0.02	94.7	-	385
Rockford Bay	2797	DBSS	7/9/97	-	4.5	5	9.2	9.74	12.26	6.99	34.6	0.02	91.5	-	385
Rockford Bay	2797	DBSS	7/9/97	-	4.5	4	10.2	9.68	11.16	7	35.2	0.02	88.6	-	384
Rockford Bay	2797	DBSS	7/9/97	-	4.5	3	11.1	9.79	10.66	7.03	35.5	0.02	88.5	-	382
Rockford Bay	2797	DBSS	7/9/97	-	4.5	2	12.3	9.81	10.31	7.04	35.9	0.02	88	-	380
Rockford Bay	2797	DBSS	7/9/97	-	4.5	1	13.2	10	10.02	7.09	36.4	0.02	89.1	-	377
Rockford Bay	2997	SSAS	7/23/97	-	5	14	0.2	10.78	19.13	7.56	37.2	0.02	109.3	-	398
Rockford Bay	2997	SSAS	7/23/97	-	5	13	0.9	10.82	18.87	7.56	37.1	0.02	109.2	-	398
Rockford Bay	2997	SSAS	7/23/97	-	5	12	1.9	10.96	18.2	7.56	36.8	0.02	109.1	-	398
Rockford Bay	2997	SSAS	7/23/97	-	5	11	2.8	11.01	18.05	7.57	36.8	0.02	109.3	-	396
Rockford Bay	2997	SSAS	7/23/97	-	5	10	3.9	11.02	18.03	7.53	36.7	0.02	109.3	-	396
Rockford Bay	2997	SSAS	7/23/97	-	5	9	5	11	18.01	7.48	36.7	0.02	109.1	-	395
Rockford Bay	2997	SSAS	7/23/97	-	5	8	5.9	11.01	17.9	7.44	36.8	0.02	109	-	395

Rockford Bay	2997	SSAS	7/23/97	-	5	7	6.9	10.99	17.74	7.38	36.8	0.02	108.5	-	396
Rockford Bay	2997	SSAS	7/23/97	-	5	6	7.9	10.87	17.49	7.32	36.8	0.02	106.7	-	396
Rockford Bay	2997	SSAS	7/23/97	-	5	5	8.9	11	16.68	7.24	36.6	0.02	106.1	-	395
Rockford Bay	2997	SSAS	7/23/97	-	5	4	9.9	10.77	16.38	7.16	36.5	0.02	103.2	-	396
Rockford Bay	2997	SSAS	7/23/97	-	5	3	10.9	10.68	15.74	7.08	36.3	0.02	101	-	394
Rockford Bay	2997	SSAS	7/23/97	-	5	2	11.9	10.59	15.24	7	36.2	0.02	99.1	-	389
Rockford Bay	2997	SSAS	7/23/97	-	5	1	12.9	10.21	14.03	6.91	35.8	0.02	93	-	385
Rockford Bay	3197	DBSS	8/5/97	-	7.7	14	0.5	9.03	23.66	7.42	41.2	0.03	105.1	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	13	1.1	9.11	23.37	7.42	41	0.03	105.5	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	12	2.1	9.24	23.08	7.39	40.8	0.03	106.5	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	11	3.1	9.29	22.99	7.36	40.6	0.03	106.5	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	10	4.1	9.3	22.86	7.34	40.4	0.03	106.7	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	9	5.1	9.34	22.66	7.29	40.3	0.03	106.8	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	8	6.1	9.53	21.58	7.27	39.4	0.03	106.7	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	7	7.1	9.52	21.44	7.14	39.5	0.03	106.3	-	369
Rockford Bay	3197	DBSS	8/5/97	-	7.7	6	8.1	9.85	19.73	7.05	37.9	0.02	106.4	-	372
Rockford Bay	3197	DBSS	8/5/97	-	7.7	5	9.1	9.99	15.56	6.85	34.6	0.02	99	-	379
Rockford Bay	3197	DBSS	8/5/97	-	7.7	4	10.1	9.29	12.25	6.69	34	0.02	85.5	-	382
Rockford Bay	3197	DBSS	8/5/97	-	7.7	3	11.1	9.15	10.74	6.63	34.4	0.02	81.3	-	383
Rockford Bay	3197	DBSS	8/5/97	-	7.7	2	12.1	9.18	10.3	6.61	34.8	0.02	80.8	-	381
Rockford Bay	3197	DBSS	8/5/97	-	7.7	1	13.1	9.08	10.02	6.57	35.4	0.02	79.4	-	385
Rockford Bay	3297	DBSS	8/14/97	-	8	14	0.3	8.54	22.49	7.43	42.7	0.03	97.9	-	378
Rockford Bay	3297	DBSS	8/14/97	-	8	13	1.7	8.55	22.45	7.37	42.7	0.03	97.9	-	379
Rockford Bay	3297	DBSS	8/14/97	-	8	12	2.7	8.65	22.25	7.35	41.9	0.03	98.8	-	380
Rockford Bay	3297	DBSS	8/14/97	-	8	11	3.7	8.68	22.06	7.33	41.1	0.03	98.7	-	379
Rockford Bay	3297	DBSS	8/14/97	-	8	10	4.7	8.67	21.88	7.28	41.2	0.03	98.2	-	381
Rockford Bay	3297	DBSS	8/14/97	-	8	9	5.7	8.62	21.69	7.19	41.3	0.03	97.3	-	384
Rockford Bay	3297	DBSS	8/14/97	-	8	8	6.7	8.64	21.35	7.13	41.3	0.03	97	-	385
Rockford Bay	3297	DBSS	8/14/97	-	8	7	7.7	8.72	20.58	7.04	39.5	0.03	96.3	-	388
Rockford Bay	3297	DBSS	8/14/97	-	8	6	8.7	9.23	17.2	6.92	36.6	0.02	95.2	-	395

Rockford Bay	3297	DBSS	8/14/97	-	8	5	9.7	9.25	16.24	6.87	35.9	0.02	93.6	-	397
Rockford Bay	3297	DBSS	8/14/97	-	8	4	10.7	9.12	14.81	6.84	35.3	0.02	89.4	-	398
Rockford Bay	3297	DBSS	8/14/97	-	8	3	11.7	9.02	13.12	6.82	34.9	0.02	85.2	-	399
Rockford Bay	3297	DBSS	8/14/97	-	8	2	12.8	8.61	12.44	6.79	35.3	0.02	80.2	-	401
Rockford Bay	3297	DBSS	8/14/97	-	8	1	13.7	8.22	10.67	6.81	36.1	0.02	73.5	-	401
Rockford Bay	3497	DBSS	8/27/97	-	8.5	14	0.3	9.16	21.23	7.43	47.7	0.03	102.6	-	372
Rockford Bay	3497	DBSS	8/27/97	-	8.5	13	1.2	9.17	21.23	7.39	47.6	0.03	102.7	-	373
Rockford Bay	3497	DBSS	8/27/97	-	8.5	12	2.2	9.19	21.16	7.37	47.8	0.03	102.9	-	374
Rockford Bay	3497	DBSS	8/27/97	-	8.5	11	3.1	9.23	21.11	7.35	47.8	0.03	103.1	-	374
Rockford Bay	3497	DBSS	8/27/97	-	8.5	10	4.1	9.24	21.06	7.31	47.9	0.03	103.4	-	375
Rockford Bay	3497	DBSS	8/27/97	-	8.5	9	5.2	9.21	21	7.26	47.7	0.03	102.8	-	377
Rockford Bay	3497	DBSS	8/27/97	-	8.5	8	6.1	9.19	20.91	7.18	47.8	0.03	102.3	-	380
Rockford Bay	3497	DBSS	8/27/97	-	8.5	7	7.2	9.17	20.76	7.09	47.7	0.03	101.8	-	383
Rockford Bay	3497	DBSS	8/27/97	-	8.5	6	8.2	9.26	18.17	6.96	42.3	0.03	97.6	-	389
Rockford Bay	3497	DBSS	8/27/97	-	8.5	5	9.2	9.23	16.83	6.9	40.5	0.03	94.8	-	392
Rockford Bay	3497	DBSS	8/27/97	-	8.5	4	10.2	9.09	15.66	6.82	39.7	0.03	90.9	-	396
Rockford Bay	3497	DBSS	8/27/97	-	8.5	3	11.3	8.94	14.06	6.79	39.1	0.03	86.3	-	398
Rockford Bay	3497	DBSS	8/27/97	-	8.5	2	12.3	8.74	11.82	6.76	39	0.03	80.4	-	400
Rockford Bay	3497	DBSS	8/27/97	-	8.5	1	13.2	8.8	11.23	6.78	39.2	0.03	79.8	-	400
Rockford Bay	3797	ASRP	9/17/97	-	8	13	0.2	9.33	16.91	7.31	48.4	0.03	97.3	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	12	1.8	9.34	16.9	7.31	48.5	0.03	97.5	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	11	2.8	9.33	16.89	7.31	48.4	0.03	97.3	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	10	3.8	9.33	16.86	7.3	48.4	0.03	97.3	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	9	4.8	9.35	16.85	7.31	48.4	0.03	97.5	-	391
Rockford Bay	3797	ASRP	9/17/97	-	8	8	5.8	9.33	16.83	7.29	48.5	0.03	97.2	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	7	6.8	9.34	16.82	7.29	48.3	0.03	97.4	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	6	7.8	9.35	16.8	7.28	48.5	0.03	97.6	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	5	8.8	9.34	16.63	7.27	47.7	0.03	96.9	-	393
Rockford Bay	3797	ASRP	9/17/97	-	8	4	9.8	9.31	16.6	7.25	47.6	0.03	96.5	-	393
Rockford Bay	3797	ASRP	9/17/97	-	8	3	10.8	9.37	16.55	7.25	47.4	0.03	97.1	-	394

Rockford Bay	3797	ASRP	9/17/97	-	8	2	11.8	9.34	16.36	7.26	46.8	0.03	96.5	-	393
Rockford Bay	3797	ASRP	9/17/97	-	8	1	12.8	9.38	16.33	7.25	46.6	0.03	96.8	-	393
Rockford Bay	3997	ASRA	9/29/97	-	8.2	10	0.2	9.72	15.81	7.19	43.5	0.03	99.1	-	446
Rockford Bay	3997	ASRA	9/29/97	-	8.2	9	1	9.68	15.72	7.18	43.6	0.03	98.5	-	446
Rockford Bay	3997	ASRA	9/29/97	-	8.2	8	2.5	9.66	15.67	7.15	43.6	0.03	98.2	-	447
Rockford Bay	3997	ASRA	9/29/97	-	8.2	7	4	9.65	15.61	7.12	43.6	0.03	98	-	447
Rockford Bay	3997	ASRA	9/29/97	-	8.2	6	5.5	9.58	15.54	7.1	43.5	0.03	97.1	-	447
Rockford Bay	3997	ASRA	9/29/97	-	8.2	5	7	9.52	15.36	7.06	43.6	0.03	96	-	448
Rockford Bay	3997	ASRA	9/29/97	-	8.2	4	8.5	9.48	15.19	7.04	43.6	0.03	95.4	-	447
Rockford Bay	3997	ASRA	9/29/97	-	8.2	3	10	9.44	15.13	6.98	43.6	0.03	94.9	-	446
Rockford Bay	3997	ASRA	9/29/97	-	8.2	2	11.3	9.51	14.94	6.95	43.6	0.03	95.1	-	444
Rockford Bay	3997	ASRA	9/29/97	-	8.2	1	12.8	9.42	14.71	6.89	43.5	0.03	93.8	-	441
Rockford Bay	4297	DBAS	10/21/97	-	7.5	12	0.4	10.03	12.41	7.16	48.2	0.03	92.9	-	396
Rockford Bay	4297	DBAS	10/21/97	-	7.5	11	1.8	10.02	12.41	7.13	48.2	0.03	92.9	-	398
Rockford Bay	4297	DBAS	10/21/97	-	7.5	10	2.8	10.02	12.41	7.13	48.2	0.03	92.9	-	397
Rockford Bay	4297	DBAS	10/21/97	-	7.5	9	3.8	10.02	12.41	7.12	48.2	0.03	92.9	-	398
Rockford Bay	4297	DBAS	10/21/97	-	7.5	8	4.8	10.02	12.41	7.09	48.3	0.03	92.9	-	399
Rockford Bay	4297	DBAS	10/21/97	-	7.5	7	5.9	10.02	12.41	7.09	48.2	0.03	92.9	-	399
Rockford Bay	4297	DBAS	10/21/97	-	7.5	6	6.8	10.02	12.41	7.07	48.3	0.03	92.9	-	399
Rockford Bay	4297	DBAS	10/21/97	-	7.5	5	7.8	10.04	12.41	7.04	48.3	0.03	93	-	400
Rockford Bay	4297	DBAS	10/21/97	-	7.5	4	8.8	10.04	12.41	7.02	48.3	0.03	92.9	-	400
Rockford Bay	4297	DBAS	10/21/97	-	7.5	3	9.8	10.02	12.41	7	48.2	0.03	92.9	-	401
Rockford Bay	4297	DBAS	10/21/97	-	7.5	2	11.8	10.03	12.4	6.93	48.2	0.03	92.9	-	402
Rockford Bay	4297	DBAS	10/21/97	-	7.5	1	12.8	10.05	12.38	6.88	48.3	0.03	93	-	404
Rockford Bay	4497	DBAS	11/4/97	-	7.2	13	0.3	10.68	10.28	7.1	46.8	0.03	94.4	39	420
Rockford Bay	4497	DBAS	11/4/97	-	7.2	12	1.7	10.69	10.15	7.07	46.9	0.03	94.1	41	423
Rockford Bay	4497	DBAS	11/4/97	-	7.2	11	2.7	10.66	10.14	7.08	46.9	0.03	93.9	46	422
Rockford Bay	4497	DBAS	11/4/97	-	7.2	10	3.8	10.67	10.12	7.07	47	0.03	93.9	122	423
Rockford Bay	4497	DBAS	11/4/97	-	7.2	9	4.7	10.73	10.09	7.04	46.8	0.03	94.4	50	425

Rockford Bay	4497	DBAS	11/4/97	-	7.2	8	5.8	10.66	10.09	7.05	46.9	0.03	93.8	49	424
Rockford Bay	4497	DBAS	11/4/97	-	7.2	7	6.7	10.66	10.07	7	46.9	0.03	93.7	101	427
Rockford Bay	4497	DBAS	11/4/97	-	7.2	6	7.7	10.66	10.07	7	46.9	0.03	93.7	108	427
Rockford Bay	4497	DBAS	11/4/97	-	7.2	5	8.7	10.66	10.05	7.01	47	0.03	93.7	124	427
Rockford Bay	4497	DBAS	11/4/97	-	7.2	4	9.7	10.72	10	6.99	47	0.03	94	101	428
Rockford Bay	4497	DBAS	11/4/97	-	7.2	3	10.7	10.75	10	6.95	47.2	0.03	94.3	42	431
Rockford Bay	4497	DBAS	11/4/97	-	7.2	2	11.7	10.71	9.99	6.96	47.2	0.03	93.9	53	430
Rockford Bay	4497	DBAS	11/4/97	-	7.2	1	12.6	10.66	9.99	6.88	47.2	0.03	93.5	730	434

Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (μs/cm)	TDS	Percent Saturation	Statime	Redox
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	10	0.2	12.97	5.69	7.39	42.6	0.03	*****	-	388
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	9	1.4	12.96	5.67	7.39	42.7	0.03	*****	-	388
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	8	2.5	12.99	5.62	7.38	42.7	0.03	*****	-	389
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	7	3.7	12.97	5.6	7.37	42.9	0.03	*****	-	389
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	6	5.2	12.93	5.52	7.37	43.1	0.03	*****	-	389
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	5	6.5	12.95	5.52	7.36	43.2	0.03	*****	-	390
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	4	7.8	12.95	5.47	7.36	42.8	0.03	*****	-	390
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	3	9.1	12.91	5.46	7.36	43.1	0.03	*****	-	390
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	2	10.5	12.89	5.42	7.35	43.3	0.03	*****	-	391
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	1	11.9	12.85	5.22	7.36	43.7	0.03	*****	-	392
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	13	0.2	11.48	12.43	7.03	21	0.01	106.8	-	420
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	12	1.1	11.6	11.46	7	36.7	0.02	105.4	-	427
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	11	2.6	11.6	10.94	6.95	36	0.02	104.2	-	431
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	10	4.1	11.39	10.15	6.9	34.8	0.02	100.4	-	433
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	9	5.6	11.34	9.74	6.89	35.3	0.02	99	-	433
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	8	7.1	11.39	9.53	6.86	36.5	0.02	99	-	434
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	7	8.6	11.4	9.15	6.84	38.2	0.02	98.2	-	434
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	6	10.1	11.38	8.69	6.81	38.7	0.02	97.1	-	435
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	5	11.6	11.36	8.17	6.8	40.8	0.03	95.5	-	436

Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	4	13.1	11.34	8.04	6.77	41.4	0.03	95	-	436
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	3	14.6	11.45	7.47	6.76	43.4	0.03	94.6	-	437
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	2	16.1	11.4	7.19	6.73	43.4	0.03	93.5	-	437
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	1	17.6	11.5	7.02	6.69	43.6	0.03	94	-	436
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	16	0.5	10.7	16.3	7.03	31.5	0.02	108.5	-	382
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	15	1.5	10.69	16.23	7.01	31.5	0.02	108.3	-	382
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	14	2.4	10.74	15.76	6.99	31.5	0.02	107.7	-	383
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	13	3.5	10.76	14.11	6.93	30.9	0.02	104.1	-	386
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	12	4.5	9.97	12.69	6.86	31.2	0.02	93.5	-	389
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	11	5.6	10.42	11.36	6.88	29.9	0.02	94.7	-	389
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	10	6.5	10.43	10.68	6.87	29.5	0.02	93.3	-	389
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	9	7.4	10.48	10.5	6.87	29.4	0.02	93.3	-	389
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	8	8.5	10.52	10.33	6.87	29.6	0.02	93.3	-	389
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	7	9.5	10.5	9.97	6.85	29.4	0.02	92.4	-	390
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	6	10.6	10.45	9.09	6.85	30.4	0.02	90	-	390
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	5	11.5	10.37	8.97	6.84	30.6	0.02	89.1	-	391
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	4	12.6	10.26	8.83	6.84	31.1	0.02	87.8	-	390
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	3	13.6	10.34	8.61	6.84	31.7	0.02	88.1	-	391
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	2	14.6	10.31	8.42	6.84	32.7	0.02	87.4	-	391
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	1	15.5	10.34	8.27	6.84	33.3	0.02	87.3	-	391
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	16	0.5	10.8	13.95	7.02	34.9	0.02	104.5	-	423
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	15	1.4	10.67	12.79	7.01	34.6	0.02	100.6	-	425
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	14	2.3	10.89	11.64	6.98	32.6	0.02	100	-	426
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	13	3.3	10.84	11.1	6.98	32	0.02	98.3	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	12	4.4	10.74	10.53	6.98	32.5	0.02	96.1	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	11	5.3	10.78	10.22	6.97	30.8	0.02	95.8	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	10	6.3	10.69	10.04	6.97	30.5	0.02	94.7	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	9	7.5	10.66	9.96	6.96	30.6	0.02	94.3	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	8	8.3	10.58	9.89	6.96	31	0.02	93.3	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	7	9.5	10.63	9.66	6.96	30.9	0.02	93.2	-	427

Windy Bay Shallow	2397	DBAS	6/11/97	-	2	6	10.4	10.6	9.63	6.96	31.4	0.02	92.8	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	5	11.6	10.61	9.5	6.96	31.5	0.02	92.7	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	4	12.5	10.61	9.32	6.95	32	0.02	92.2	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	3	13.6	10.56	9.1	6.95	33	0.02	91.3	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	2	14.7	10.65	8.68	6.95	34.5	0.02	91.1	-	428
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	1	15.7	10.64	8.66	6.96	34.7	0.02	91	-	427
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	16	0.4	10.71	14.84	7.13	35.5	0.02	105.6	-	440
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	15	0.8	10.71	14.83	7.14	35.4	0.02	105.5	-	438
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	14	1.7	10.72	14.74	7.11	35.4	0.02	105.5	-	440
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	13	2.7	10.74	14.21	7.11	35.4	0.02	104.4	-	440
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	12	3.7	10.81	13.65	7.09	34.9	0.02	103.8	-	441
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	11	4.7	10.83	13.22	7.08	34.3	0.02	103	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	10	5.6	10.82	12.61	7.08	34	0.02	101.4	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	9	6.5	10.8	12.73	7.07	34	0.02	101.4	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	8	7.9	10.81	12.12	7.05	33.5	0.02	100.2	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	7	8.5	10.77	12.05	7.05	33.6	0.02	99.8	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	6	9.7	10.81	11.61	7.04	33.5	0.02	99.1	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	5	10.6	10.82	11.56	7.04	33.4	0.02	99.1	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	4	11.5	10.79	11.41	7.03	33.7	0.02	98.4	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	3	12.5	10.78	11.2	7.03	33.7	0.02	97.9	-	441
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	2	13.6	10.81	11.12	7.03	33.7	0.02	98	-	441
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	1	14.8	10.78	11.02	7.05	33.5	0.02	97.5	-	440
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	16	0.4	10.28	16.6	7.25	37.3	0.02	*****	-	411
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	15	1.1	10.28	16.59	7.24	37.3	0.02	*****	-	412
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	14	2	10.29	16.55	7.2	37.3	0.02	*****	-	414
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	13	2.9	10.28	16.53	7.18	37.3	0.02	*****	-	414
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	12	3.9	10.28	16.32	7.15	37.4	0.02	*****	-	414
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	11	5	10.39	15.56	7.12	36.7	0.02	*****	-	416
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	10	6	10.4	15.31	7.1	36.5	0.02	*****	-	416
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	9	7	10.35	15.03	7.06	36.8	0.02	*****	-	417

Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	8	8	10.35	14.51	7.06	36	0.02	*****	-	418
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	7	9	10.3	14.21	7.03	36.3	0.02	*****	-	418
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	6	10.1	10.19	13.65	6.99	35.2	0.02	98.7	-	419
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	5	11	10.04	13.32	6.94	35.3	0.02	96.5	-	420
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	4	12	9.95	12.79	6.93	34.7	0.02	94.5	-	421
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	3	13	9.66	11.92	6.9	34.9	0.02	90	-	423
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	2	14	9.5	10.12	6.9	36.4	0.02	84.8	-	424
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	1	15	9.57	9.74	6.94	37.4	0.02	84.7	-	422
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	10	1.6	10.61	19.64	7.58	39.1	0.03	108.7	-	437
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	9	3	10.74	19.09	7.58	38.8	0.02	108.9	-	437
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	8	4.7	11.09	18.2	7.53	37.9	0.02	110.4	-	439
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	7	6.1	11.2	17.22	7.43	37.5	0.02	109.3	-	442
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	6	7.6	11.19	16.86	7.34	37.3	0.02	108.3	-	444
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	5	9	11.06	16.59	7.26	37.2	0.02	106.5	-	445
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	4	10.5	10.86	15.92	7.17	36.6	0.02	103.1	-	447
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	3	12	10.67	15.4	7.05	36.6	0.02	100	-	449
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	2	13.5	9.73	14.29	6.93	36.9	0.02	89.2	-	453
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	1	15.5	9.38	11.93	6.87	36.7	0.02	81.7	-	455
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	12	0.4	8.97	24.09	7.47	42.1	0.03	105.3	-	369
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	11	1	8.97	24.06	7.47	42	0.03	105.3	-	370
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	10	2.5	9.06	23.78	7.42	42.1	0.03	105.8	-	372
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	9	4	9.06	23.38	7.4	42	0.03	105	-	373
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	8	5.5	9.39	22.43	7.35	41.3	0.03	106.8	-	374
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	7	7	9.93	20.42	7.23	39.5	0.03	108.6	-	378
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	6	8.5	10	17.76	7.11	36.1	0.02	103.5	-	383
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	5	10	9.48	14.74	6.98	34.9	0.02	92.2	-	389
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	4	11.5	9.06	12.82	6.95	34.6	0.02	84.5	-	392
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	3	13	8.88	10.21	6.94	35.4	0.02	78	-	394
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	2	14.5	8.99	9.33	6.97	36.2	0.02	77.3	-	394
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	1	16	8.8	8.9	7.01	37.6	0.02	75.1	-	394

Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	14	0.2	8.65	22.04	7.52	41.5	0.03	98.3	-	378
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	13	1.6	8.65	22.01	7.41	41.5	0.03	98.3	-	381
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	12	2.6	8.64	22.02	7.4	41.6	0.03	98.2	-	381
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	11	3.6	8.64	21.99	7.32	41.6	0.03	98.2	-	384
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	10	4.6	8.64	21.92	7.26	41.6	0.03	98	-	386
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	9	5.5	8.64	21.78	7.19	41.5	0.03	97.7	-	388
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	8	6.6	8.6	21.32	7.05	41.6	0.03	96.4	-	394
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	7	7.6	8.99	16.09	7.02	35.7	0.02	90.6	-	398
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	6	8.5	8.96	15.22	7.01	35.6	0.02	88.8	-	399
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	5	9.6	8.77	14.04	7.01	35.3	0.02	84.7	-	400
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	4	10.5	8.59	12.81	7.03	35	0.02	80.6	-	400
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	3	11.5	8.43	12.08	7.07	35.2	0.02	77.9	-	399
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	2	12.6	8.19	11.67	7.14	35.7	0.02	74.9	-	396
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	1	13.7	8.03	10.82	7.13	36.3	0.02	72	-	398
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	12	0.4	9.26	20.74	7.51	46.5	0.03	102.8	-	368
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	11	1	9.27	20.76	7.5	46.4	0.03	102.9	-	368
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	10	2.5	9.26	20.74	7.48	46.5	0.03	102.8	-	369
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	9	3.9	9.27	20.74	7.45	46.4	0.03	102.8	-	370
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	8	5.5	9.23	20.7	7.38	46.6	0.03	102.4	-	372
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	7	7.1	9.21	20.65	7.27	46.8	0.03	102	-	377
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	6	8.6	9.02	17.29	6.94	39.9	0.03	93.4	-	389
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	5	10	9.19	14.11	6.9	38.6	0.02	88.9	-	392
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	4	11.5	8.86	12.31	6.86	38.7	0.02	82.3	-	395
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	3	13.1	8.52	10.95	6.86	39.6	0.03	76.7	-	396
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	2	14.4	8.44	9.36	6.9	41.3	0.03	73.2	-	396
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	1	16.1	8.59	8.64	7.06	42.5	0.03	73.2	-	392
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	16	0.2	9.32	17.01	7.27	47.5	0.03	97.5	-	384
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	15	1.7	9.32	17.01	7.26	47.6	0.03	97.5	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	14	2.7	9.32	17	7.24	47.6	0.03	97.5	-	385

Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	13	3.7	9.3	17.01	7.24	47.5	0.03	97.3	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	12	4.7	9.3	16.98	7.23	47.6	0.03	97.2	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	11	5.7	9.31	16.96	7.22	47.6	0.03	97.2	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	10	6.7	9.29	16.91	7.19	47.3	0.03	97	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	9	7.7	9.28	16.81	7.18	47.2	0.03	96.8	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	8	8.7	9.29	16.75	7.15	47.1	0.03	96.8	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	7	9.7	9.31	16.58	7.13	46.5	0.03	96.5	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	6	10.7	9.33	16.52	7.1	46.3	0.03	96.6	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	5	11.7	9.31	16.48	7.07	46.1	0.03	96.3	-	386
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	4	12.7	9.3	16.38	7.05	45.9	0.03	96	-	386
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	3	13.7	9.24	16.04	7	45.6	0.03	94.7	-	387
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	2	14.7	9.23	15.25	6.96	43.7	0.03	93	-	388
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	1	15.7	9.13	15.04	6.94	43.9	0.03	91.8	-	388
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	11	0.3	9.65	14.71	7.17	46.5	0.03	96.1	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	10	2	9.62	14.67	7.18	46.6	0.03	95.7	-	447
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	9	3.5	9.61	14.64	7.17	46.6	0.03	95.5	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	8	5	9.59	14.61	7.17	46.6	0.03	95.3	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	7	6.5	9.55	14.54	7.16	46.9	0.03	94.8	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	6	8	9.54	14.52	7.15	46.9	0.03	94.7	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	5	9.5	9.5	14.44	7.15	46.5	0.03	94	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	4	11	9.52	14.41	7.15	46.9	0.03	94.2	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	3	12.5	9.47	14.27	7.15	46.6	0.03	93.7	-	447
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	2	14	9.52	14.24	7.15	46.9	0.03	93.8	-	447
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	1	15.2	9.48	14.16	7.15	46.8	0.03	93.2	-	447
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	16	0.3	10.06	12.32	7.24	49.9	0.03	93	-	387
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	15	1	10.07	12.33	7.25	49.8	0.03	93.1	-	387
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	14	2	10.05	12.33	7.25	49.8	0.03	93	-	387
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	13	3	10.05	12.33	7.24	49.9	0.03	93	-	388
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	12	4	10.06	12.32	7.24	49.9	0.03	93	-	387
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	11	5	10.05	12.33	7.23	50	0.03	93	-	387

Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	10	6	10.05	12.33	7.21	49.9	0.03	93	-	388
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	9	7	10.05	12.33	7.2	49.9	0.03	93	-	388
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	8	8	10.04	12.33	7.19	49.8	0.03	93	-	389
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	7	9	10.06	12.32	7.18	49.9	0.03	93	-	389
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	6	10	10.07	12.32	7.15	49.9	0.03	93.1	-	390
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	5	11	10.07	12.33	7.16	49.9	0.03	93.1	-	389
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	4	12	10.08	12.32	7.13	49.9	0.03	93.2	-	390
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	3	13	10.09	12.33	7.12	49.9	0.03	93.3	-	391
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	2	14	10.1	12.32	7.1	49.9	0.03	93.3	-	391
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	1	15	10.11	12.3	7.06	50	0.03	93.5	-	392
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	11	0.4	10.55	10.17	7.05	47.6	0.03	93	57	409
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	10	1.7	10.53	9.89	7.14	47.7	0.03	92.2	105	406
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	9	3.2	10.53	9.78	7.1	48.2	0.03	91.9	144	408
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	8	4.7	10.53	9.74	7.12	48.6	0.03	91.8	117	407
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	7	6.2	10.51	9.66	7.14	49.1	0.03	91.5	141	406
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	6	7.7	10.52	9.55	7.1	49.7	0.03	91.4	134	408
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	5	9.2	10.55	9.51	7.12	49.8	0.03	91.5	100	407
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	4	10.7	10.56	9.46	7.09	50	0.03	91.5	138	408
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	3	12.2	10.49	9.42	7.09	50.2	0.03	90.8	152	408
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	2	13.7	10.53	9.33	7.08	50.2	0.03	90.9	115	409
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	1	15.2	10.46	9.33	7.09	50.3	0.03	90.3	601	409

Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	27	0.4	12.89	5.6	7.38	43.4	0.03	*****	-	385
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	26	1	12.89	5.6	7.36	43.5	0.03	*****	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	25	2	12.95	5.57	7.37	43.4	0.03	*****	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	24	3.2	12.96	5.54	7.37	43.5	0.03	*****	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	23	4.2	12.77	5.54	7.36	43.5	0.03	*****	-	386
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	22	5.5	12.88	5.51	7.35	43.6	0.03	*****	-	387

Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	21	6.7	12.83	5.5	7.35	43.5	0.03	*****		387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	20	7.8	12.98	5.39	7.34	43.6	0.03	*****	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	19	9	12.7	5.34	7.33	43.5	0.03	*****	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	18	10.1	12.87	5.32	7.33	43.5	0.03	*****	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	17	11.4	12.92	5.3	7.33	43.5	0.03	*****	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	16	12.8	12.72	5.24	7.33	43.5	0.03	*****	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	15	14	12.75	5.22	7.32	43.4	0.03	*****	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	14	15.3	12.86	5.17	7.32	43.3	0.03	*****	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	13	16.5	12.62	5.12	7.32	43.2	0.03	99	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	12	17.8	12.61	5.09	7.31	43.2	0.03	99	-	389
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	11	19	12.59	5.04	7.31	43.2	0.03	98.7	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	10	20.2	12.63	5.06	7.31	43.2	0.03	99	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	9	21.5	12.77	4.99	7.31	43.2	0.03	99.9	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	8	22.7	12.77	4.96	7.3	43.3	0.03	99.9	-	389
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	7	24	12.84	4.74	7.31	43.9	0.03	99.9	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	6	25.3	12.7	4.73	7.3	43.9	0.03	98.8	-	389
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	5	26.5	12.79	4.74	7.3	43.9	0.03	99.5	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	4	27.9	12.85	4.74	7.31	43.9	0.03	99.7	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	3	29.1	12.85	4.71	7.3	43.9	0.03	99.8	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	2	30.5	12.71	4.71	7.3	44	0.03	98.8	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	1	31.8	12.93	4.74	7.31	43.9	0.03	*****	-	387
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	19	0.2	11.55	12.53	7.06	36.7	0.02	107.6	-	413
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	18	1.8	11.42	10.91	7.05	34.6	0.02	102.4	-	417
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	17	3.8	11.3	9.97	7.01	34.4	0.02	99.2	-	419
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	16	5.8	11.31	9.48	7	35	0.02	98.2	-	419
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	15	7.8	11.3	9.09	6.98	35.3	0.02	97.2	-	420
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	14	9.8	11.44	8.3	6.98	37.5	0.02	96.5	-	420
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	13	11.8	11.49	7.66	6.97	39.6	0.03	95.4		421
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	12	13.8	11.53	7.27	6.96	40.2	0.03	94.8	-	421
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	11	15.8	11.54	7.12	6.96	40.6	0.03	94.6	-	421
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	10	17.8	11.55	7.07	6.96	40.9	0.03	94.5	-	420

Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	9	19.8	11.63	6.79	6.95	42.7	0.03	94.5	-	420
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	8	21.8	11.65	6.66	6.95	43.3	0.03	94.4	-	420
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	7	23.8	11.74	6.33	6.94	45.1	0.03	94.3	-	419
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	6	25.8	11.71	6.33	6.94	45.3	0.03	94.1	-	419
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	5	27.8	11.72	6.25	6.93	45.8	0.03	93.8	-	419
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	4	29.8	11.63	6.17	6.92	46	0.03	93	-	418
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	3	31.8	11.6	5.89	6.9	47	0.03	92.1	-	418
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	2	33.8	11.57	5.75	6.91	47.2	0.03	91.6	-	421
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	1	35.8	11.52	5.75	6.91	47.5	0.03	91.1	-	425
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	19	0.2	10.79	15.64	7.04	31.2	0.02	107.9	-	385
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	18	1	10.79	15.59	7.01	31.3	0.02	107.8	-	386
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	17	3	10.89	14.01	6.95	31.2	0.02	105.1	-	390
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	16	5	10.49	11.31	6.9	30.6	0.02	95.3	-	394
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	15	7	10.51	10.33	6.92	29.1	0.02	93.3	-	393
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	14	9	10.6	9.99	6.92	28.2	0.02	93.3	-	392
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	13	11.1	10.72	9.42	6.92	29.4	0.02	93.1		393
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	12	12.9	10.8	8.99	6.93	29.1	0.02	92.7	-	393
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	11	14.9	10.88	8.48	6.92	31.1	0.02	92.3	-	393
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	10	17	11.03	7.91	6.91	34.3	0.02	92.3	-	394
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	9	19	11.14	7.33	6.89	37.4	0.02	91.9	-	395
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	8	21	11.05	7.1	6.88	38.4	0.02	90.7	-	395
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	7	23	11.13	6.61	6.87	40.4	0.03	90.2	-	396
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	6	24.9	11.12	6.33	6.86	41.5	0.03	89.5	-	396
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	5	27.1	11.03	6.08	6.85	42.5	0.03	88.2	-	397
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	4	28.9	11.03	5.97	6.85	42.8	0.03	87.9	-	397
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	3	30.9	10.89	5.87	6.84	43.3	0.03	86.6	-	398
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	2	33.1	10.89	5.84	6.85	43.4	0.03	86.4	-	398
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	1	35	10.81	5.9	6.85	43.4	0.03	86.1	-	398
Windy Bay Deep	2397	DBAS	6/11/97	-	2	17	0.8	10.58	14.84	6.97	37	0.02	104.4	-	422
Windy Bay Deep	2397	DBAS	6/11/97	-	2	16	2.8	10.68	13.55	6.94	35.7	0.02	102.6	-	424

Windy Bay Deep	2397	DBAS	6/11/97	-	2	15	4.8	10.67	10.86	6.95	31.8	0.02	96.2	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	14	6.9	10.7	10.12	6.95	30.1	0.02	94.8	-	424
Windy Bay Deep	2397	DBAS	6/11/97	-	2	13	8.8	10.61	9.91	6.94	30.1	0.02	93.5	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	12	10.8	10.67	9.2	6.94	31.8	0.02	92.5	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	11	12.8	10.66	9.02	6.93	33.2	0.02	92	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	10	14.8	10.67	8.84	6.93	33.9	0.02	91.7	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	9	16.7	10.67	8.58	6.92	35.2	0.02	91.2	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	8	18.9	10.75	7.86	6.91	38.3	0.02	90.3	-	426
Windy Bay Deep	2397	DBAS	6/11/97	-	2	7	20.7	10.81	6.91	6.89	42.8	0.03	88.6	-	427
Windy Bay Deep	2397	DBAS	6/11/97	-	2	6	22.6	10.81	6.76	6.89	43.7	0.03	88.2	-	427
Windy Bay Deep	2397	DBAS	6/11/97	-	2	5	24.8	10.82	6.61	6.89	44.3	0.03	88	-	426
Windy Bay Deep	2397	DBAS	6/11/97	-	2	4	26.8	10.85	6.51	6.88	44.7	0.03	88	-	426
Windy Bay Deep	2397	DBAS	6/11/97	-	2	3	28.7	10.92	6.33	6.88	45.4	0.03	88.2	-	426
Windy Bay Deep	2397	DBAS	6/11/97	-	2	2	30.5	10.76	6.18	6.88	46.2	0.03	86.4	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	1	32.4	10.85	5.98	6.87	47.1	0.03	86.7	-	426
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	16	0.3	10.75	13.52	7.13	35	0.02	102.9	-	435
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	15	1.2	10.74	13.52	7.12	35	0.02	102.8	-	436
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	14	3.3	10.76	13.44	7.08	34.9	0.02	102.8	-	437
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	13	5.3	10.79	12.84	7.05	34.5	0.02	101.6	-	438
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	12	7.4	10.78	12.14	7.05	33.5	0.02	100	-	438
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	11	9.4	10.7	11.99	7.02	33.2	0.02	99	-	437
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	10	11.4	10.74	11.92	7	33.1	0.02	99.2	-	437
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	9	13.4	10.77	11.27	6.98	33.1	0.02	98	-	437
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	8	15.3	10.75	10.79	6.96	33	0.02	96.7	-	438
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	7	17.4	10.64	9.37	6.92	34.9	0.02	92.5	-	439
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	6	19.4	10.66	7.47	6.9	39.3	0.03	88.5	-	441
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	5	21.2	10.65	7.27	6.9	40.2	0.03	87.9	-	440
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	4	23.3	10.67	6.73	6.9	42.3	0.03	87	-	440
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	3	25.3	10.71	6.56	6.9	43	0.03	86.8	-	439
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	2	27.3	10.62	6.23	6.91	44.4	0.03	85.5	-	438
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	1	29.2	10.67	6.25	6.93	44.4	0.03	85.9	-	437

Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	16	0.3	10.09	17.22	7.16	38.2	0.02	*****	-	421
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	15	1	10.11	17.17	7.15	38.1	0.02	*****	-	421
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	14	3	10.19	16.89	7.06	37.9	0.02	*****	-	425
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	13	5	10.35	15.28	7.04	36.2	0.02	*****	-	426
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	12	7	10.26	14.31	6.98	35.7	0.02	*****	-	428
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	11	9	10.18	13.32	6.93	35.2	0.02	97.9	-	429
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	10	11	9.93	12.73	6.86	34.4	0.02	94.3	-	431
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	9	13	9.88	11.56	6.83	34.5	0.02	91.5	-	433
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	8	15	9.83	9.32	6.78	37.1	0.02	86.2	-	435
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	7	17	10.07	7.65	6.79	40.5	0.03	84.7	-	436
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	6	18.9	10.12	7.43	6.78	41	0.03	84.7	-	436
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	5	20.9	10.3	7.1	6.79	41.4	0.03	85.5	-	436
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	4	23	10.31	6.79	6.79	42.7	0.03	84.8	-	436
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	3	25	10.32	6.69	6.79	43.1	0.03	84.8	-	436
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	2	27	10.34	6.4	6.78	44.4	0.03	84.3	-	436
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	1	29.1	10.13	6.13	6.78	45.6	0.03	82.1	-	436
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	15	0.4	9.68	20.43	7.4	38.9	0.02	*****	-	417
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	14	1.5	9.88	19.74	7.38	38	0.02	*****	-	418
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	13	5.6	10.3	17.73	7.24	35.3	0.02	*****	-	423
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	12	7.6	10.39	16.87	7.14	35.4	0.02	*****	-	426
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	11	9.6	10.36	16.08	6.99	35.3	0.02	*****	-	431
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	10	11.6	9.99	14.64	6.85	34.2	0.02	97.7	-	437
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	9	13.6	9.49	13.24	6.75	33.4	0.02	90	-	441
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	8	15.6	8.99	10.54	6.69	34	0.02	80.2	-	444
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	7	17.6	9.71	8.29	6.67	37	0.02	82	-	446
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	6	19.6	9.92	7.28	6.67	39.2	0.03	81.7	-	446
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	5	21.6	9.99	6.87	6.66	40.4	0.03	81.4	-	447
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	4	23.6	10.1	6.66	6.66	41.1	0.03	81.8	-	447
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	3	25.5	10.09	6.51	6.66	41.5	0.03	81.5	-	446
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	2	27.7	10.07	6.31	6.66	42.2	0.03	81	-	446

Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	1	29.6	9.6	6.33	6.65	42.7	0.03	77.2	-	447
Windy Bay Deep	3197	DBSS	8/5/97	-	8	18	0.3	8.91	24.3	7.42	42.5	0.03	105	-	371
Windy Bay Deep	3197	DBSS	8/5/97	-	8	17	2.3	9.05	23.52	7.4	43.6	0.03	105.1	-	372
Windy Bay Deep	3197	DBSS	8/5/97	-	8	16	4.2	9.24	22.92	7.31	43	0.03	106.1	-	375
Windy Bay Deep	3197	DBSS	8/5/97	-	8	15	6.3	9.79	20.85	7.2	40	0.03	108.1	-	378
Windy Bay Deep	3197	DBSS	8/5/97	-	8	14	8.3	10.19	16.78	7.03	35.7	0.02	103.5	-	385
Windy Bay Deep	3197	DBSS	8/5/97	-	8	13	10.4	9.31	13.48	6.87	34.2	0.02	88	-	392
Windy Bay Deep	3197	DBSS	8/5/97	-	8	12	12.3	8.86	11.15	6.84	34.7	0.02	79.6	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	11	14.2	8.98	9.66	6.85	35.4	0.02	77.8	-	395
Windy Bay Deep	3197	DBSS	8/5/97	-	8	10	16.2	9.21	8.37	6.85	37.6	0.02	77.4	-	395
Windy Bay Deep	3197	DBSS	8/5/97	-	8	9	18.3	9.66	7.5	6.87	38.7	0.02	79.5	-	395
Windy Bay Deep	3197	DBSS	8/5/97	-	8	8	20.3	9.78	7.05	6.87	40.3	0.03	79.5	-	395
Windy Bay Deep	3197	DBSS	8/5/97	-	8	7	22.3	9.96	6.79	6.89	40.8	0.03	80.4	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	6	24.2	10.08	6.57	6.89	41.3	0.03	81	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	5	26.3	10.1	6.38	6.91	42	0.03	80.7	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	4	28.3	10	6.23	6.92	42.7	0.03	79.7	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	3	30.3	9.74	6.26	6.93	43.2	0.03	77.7	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	2	32.3	9.57	6.21	6.94	43.2	0.03	76.2	-	393
Windy Bay Deep	3197	DBSS	8/5/97	-	8	1	34.3	9.56	6.18	6.98	44.8	0.03	76.1	-	392
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	16	0.3	8.72	22.94	7.3	41.9	0.03	100.8	-	382
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	15	1.3	8.77	22.33	7.2	42.6	0.03	100.2	-	388
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	14	3.3	8.8	22.03	7.13	43.1	0.03	100.1	-	391
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	13	5.3	8.9	21.82	7.43	42	0.03	100.7	-	384
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	12	7.3	8.87	21.61	7.31	41.5	0.03	100	-	388
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	11	9.3	8.96	20.73	7.4	41.3	0.03	99.4	-	383
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	10	11.3	8.86	13.82	6.78	35.3	0.02	85.6	-	408
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	9	13.5	8.82	11.59	7.2	35.9	0.02	80.5	-	399
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	8	15.4	8.47	10.68	6.75	35.9	0.02	75.7	-	411
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	7	17.4	8.57	9.04	6.76	37.3	0.02	73.7	-	411
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	6	19.3	8.84	8.18	6.77	39	0.03	74.4	-	411

Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	5	21.4	9.11	7.27	6.78	40.8	0.03	74.9	-	411
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	4	23.4	9.37	6.92	6.8	41.5	0.03	76.6	-	410
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	3	25.4	9.5	6.72	6.81	42.1	0.03	77.1	-	409
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	2	27.4	9.52	6.56	6.82	42.5	0.03	76.9	-	408
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	1	29.4	9.12	6.33	6.83	43.8	0.03	73.3	-	408
Windy Bay Deep	3497	DBSS	8/27/97	-	8	16	0.3	9.22	20.87	7.41	47	0.03	102.6	-	372
Windy Bay Deep	3497	DBSS	8/27/97	-	8	15	1.5	9.23	20.83	7.39	47.1	0.03	102.7	-	372
Windy Bay Deep	3497	DBSS	8/27/97	-	8	14	3.5	9.23	20.78	7.33	46.9	0.03	102.5	-	374
Windy Bay Deep	3497	DBSS	8/27/97	-	8	13	5.4	9.24	20.67	7.26	46.8	0.03	102.4	-	375
Windy Bay Deep	3497	DBSS	8/27/97	-	8	12	7.5	9.15	20.69	7.08	46.7	0.03	101.5	-	382
Windy Bay Deep	3497	DBSS	8/27/97	-	8	11	9.5	9.28	15.93	6.87	38.8	0.02	93.5	-	394
Windy Bay Deep	3497	DBSS	8/27/97	-	8	10	11.5	8.91	12.38	6.82	38.3	0.02	82.9	-	397
Windy Bay Deep	3497	DBSS	8/27/97	-	8	9	13.6	8.48	9.58	6.8	40.6	0.03	73.9	-	399
Windy Bay Deep	3497	DBSS	8/27/97	-	8	8	15.5	9.07	7.68	6.8	43.2	0.03	75.5	-	401
Windy Bay Deep	3497	DBSS	8/27/97	-	8	7	17.2	9.43	7.07	6.83	44.3	0.03	77.4	-	400
Windy Bay Deep	3497	DBSS	8/27/97	-	8	6	21.6	9.72	6.64	6.88	45.3	0.03	78.8	-	399
Windy Bay Deep	3497	DBSS	8/27/97	-	8	5	23.5	9.72	6.5	6.89	45.6	0.03	78.6	-	398
Windy Bay Deep	3497	DBSS	8/27/97	-	8	4	25.6	9.71	6.38	6.9	46.1	0.03	78.2	-	398
Windy Bay Deep	3497	DBSS	8/27/97	-	8	3	27.5	9.58	6.3	6.92	46.4	0.03	77	-	398
Windy Bay Deep	3497	DBSS	8/27/97	-	8	2	29.5	9.47	6.28	6.96	46.5	0.03	76.2	-	397
Windy Bay Deep	3497	DBSS	8/27/97	-	8	1	31.7	9.48	6.28	7.05	46.7	0.03	76.2	-	395
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	17	0.4	9.28	17.53	7.3	52	0.03	98.1	-	389
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	16	2.7	9.34	17.56	7.27	52	0.03	98.6	-	390
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	15	4.7	9.22	17.51	7.22	52	0.03	97.5	-	392
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	14	6.7	9.22	17.24	7.18	50.2	0.03	96.9	-	393
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	13	8.7	9.25	17.17	7.15	49.7	0.03	97.1	-	393
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	12	10.7	9.28	17.12	7.08	48.7	0.03	97.3	-	395
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	11	12.7	9.26	16.8	6.98	47.3	0.03	96.3	-	398
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	10	14.7	9.07	15.91	6.86	45	0.03	92.6	-	403
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	9	16.7	8.66	12.17	6.73	40.1	0.03	81.4	-	411

Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	8	18.7	8.43	10.51	6.7	41.1	0.03	76.3	-	412
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	7	20.7	8.47	9.46	6.71	41.9	0.03	74.8	-	412
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	6	22.7	8.57	8.43	6.71	42.7	0.03	73.8	-	413
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	5	24.7	8.89	7.38	6.72	43.9	0.03	74.6	-	413
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	4	26.7	9.04	7.07	6.74	44.5	0.03	75.3	-	412
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	3	28.7	9.16	6.73	6.76	45.2	0.03	75.6	-	411
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	2	30.7	9.21	6.64	6.8	45.2	0.03	75.9	-	410
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	1	32.7	9.23	6.64	6.84	45.2	0.03	76	-	408
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	17	0.2	9.77	15.09	7.16	46.3	0.03	98.1	-	444
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	16	2	9.65	15.03	7.16	46.4	0.03	96.8	-	444
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	15	4	9.6	14.96	7.15	46.2	0.03	96.2	-	444
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	14	6	9.59	14.78	7.11	46.6	0.03	95.7	-	445
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	13	8	9.57	14.66	7.09	46.5	0.03	95.2	-	446
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	12	10	9.57	14.66	7.07	46.6	0.03	95.2	-	446
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	11	12	9.5	14.58	7.02	46.5	0.03	94.3	-	447
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	10	14	9.39	14.35	6.97	45.9	0.03	92.8	-	448
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	9	16	9.34	13.92	6.94	45.4	0.03	91.4	-	449
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	8	18	9.28	13.6	6.91	45	0.03	90.2	-	450
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	7	20	9.23	13.3	6.85	44.7	0.03	89.1	-	451
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	6	22	8.88	11.2	6.78	42.2	0.03	81.7	-	455
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	5	23.9	8.9	8.48	6.75	41.4	0.03	76.8	-	457
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	4	26	8.91	7.97	6.74	41.8	0.03	75.9	-	457
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	3	28	8.94	7.6	6.76	42	0.03	75.5	-	457
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	2	30	8.93	7.28	6.8	42.2	0.03	74.8	-	455
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	1	31.8	9.05	7	6.83	42.6	0.03	75.3	-	454
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	16	0.3	9.92	12.28	7.14	49.7	0.03	91.7	-	386
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	15	1	9.94	12.28	7.14	49.7	0.03	91.8	-	387
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	14	3	9.92	12.3	7.14	49.7	0.03	91.6	-	386
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	13	5	9.91	12.3	7.12	49.7	0.03	91.5	-	387
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	12	7	9.91	12.28	7.1	49.9	0.03	91.6	-	387

Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	11	9	9.92	12.27	7.07	49.8	0.03	91.6	-	388
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	10	11	9.91	12.27	7.03	49.7	0.03	91.5	-	388
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	9	13	9.88	12.27	6.99	49.7	0.03	91.2	-	389
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	8	15	9.82	12.27	6.91	49.8	0.03	90.7	-	392
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	7	17	9.74	12.18	6.8	49.8	0.03	89.7	-	395
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	6	19	8.21	10.1	6.64	48.8	0.03	72.1	-	401
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	5	21	8.3	7.99	6.64	47.5	0.03	69.2	-	402
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	4	23	8.4	7.35	6.64	47.5	0.03	69	-	402
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	3	25	8.27	6.96	6.65	47.6	0.03	67.3	-	402
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	2	27	8.28	6.91	6.65	47.9	0.03	67.2	-	402
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	1	29.1	8.27	6.84	6.71	47.9	0.03	67	-	401
Windy Bay Deep	4497	DBAS	11/4/97	-	7	16	0.6	10.6	10.33	7.11	46.8	0.03	93.7	57	411
Windy Bay Deep	4497	DBAS	11/4/97	-	7	15	2.8	10.56	10.23	7.1	46.9	0.03	93.1	142	413
Windy Bay Deep	4497	DBAS	11/4/97	-	7	14	4.8	10.5	10.22	7.11	46.9	0.03	92.6	207	413
Windy Bay Deep	4497	DBAS	11/4/97	-	7	13	6.8	10.43	10.07	7.09	47.1	0.03	91.6	56	414
Windy Bay Deep	4497	DBAS	11/4/97	-	7	12	8.8	10.46	10.07	7.08	47.1	0.03	91.9	46	415
Windy Bay Deep	4497	DBAS	11/4/97	-	7	11	10.8	10.45	10.09	7.09	47.2	0.03	91.9	40	415
Windy Bay Deep	4497	DBAS	11/4/97	-	7	10	12.8	10.46	10.07	7.09	47.2	0.03	91.9	117	415
Windy Bay Deep	4497	DBAS	11/4/97	-	7	9	14.8	10.47	10.05	7.09	47.2	0.03	92	159	415
Windy Bay Deep	4497	DBAS	11/4/97	-	7	8	16.8	10.42	10.04	7.08	47.4	0.03	91.5	132	415
Windy Bay Deep	4497	DBAS	11/4/97	-	7	7	18.8	10.44	10.04	7.08	47.3	0.03	91.7	102	415
Windy Bay Deep	4497	DBAS	11/4/97	-	7	6	20.8	10.45	10.02	7.07	47.3	0.03	91.7	112	416
Windy Bay Deep	4497	DBAS	11/4/97	-	7	5	22.8	10.43	9.97	7.07	47.5	0.03	91.5	52	416
Windy Bay Deep	4497	DBAS	11/4/97	-	7	4	24.8	10.39	9.91	7.04	47.7	0.03	91	55	417
Windy Bay Deep	4497	DBAS	11/4/97	-	7	3	26.8	10.34	9.71	7.03	48.3	0.03	90.1	119	418
Windy Bay Deep	4497	DBAS	11/4/97	-	7	2	28.8	10.24	9.33	7.02	49.5	0.03	88.5	111	419
Windy Bay Deep	4497	DBAS	11/4/97	-	7	1	30.8	10.05	9.02	7.01	50	0.03	86.1	631	421

CDA River	1597	ASSS	4/18/97	-	1.8	17	0.4	12.48	6.49	7.48	37.4	0.02	*****	-	372
CDA River	1597	ASSS	4/18/97	-	1.8	16	1.4	12.52	6.33	7.46	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	15	2.4	12.46	6.3	7.46	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	14	3.5	12.47	6.28	7.45	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	13	4.6	12.42	6.28	7.44	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	12	5.5	12.4	6.28	7.44	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	11	6.6	12.41	6.26	7.43	37.5	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	10	7.8	12.39	6.25	7.43	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	9	8.8	12.45	6.23	7.42	37.5	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	8	10	12.42	6.2	7.42	37.5	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	7	11.1	12.38	6.17	7.42	37.6	0.02	99.9	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	6	12.4	12.34	6.08	7.41	38	0.02	99.3	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	5	13.5	12.32	5.88	7.41	38.4	0.02	98.6	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	4	14.8	12.27	5.77	7.4	38.5	0.02	98	-	375
CDA River	1597	ASSS	4/18/97	-	1.8	3	16	12.23	5.67	7.39	38.4	0.02	97.4	-	376
CDA River	1597	ASSS	4/18/97	-	1.8	2	17.2	12.19	5.59	7.39	38.3	0.02	96.9	-	380
CDA River	1597	ASSS	4/18/97	-	1.8	1	18.6	12.59	5.44	7.38	38.4	0.02	99.9	-	382
CDA River	1997	DBSS	5/16/97	-	0.6	15	0.2	10.61	14.93	6.94	32	0.02	104.3	-	390
CDA River	1997	DBSS	5/16/97	-	0.6	14	1.6	10.56	12.51	6.86	32	0.02	98.3	-	399
CDA River	1997	DBSS	5/16/97	-	0.6	13	2.7	10.43	12.37	6.84	32.1	0.02	96.8	-	401
CDA River	1997	DBSS	5/16/97	-	0.6	12	3.7	10.41	12.27	6.83	32.3	0.02	96.4	-	402
CDA River	1997	DBSS	5/16/97	-	0.6	11	4.7	10.33	12.18	6.82	32.2	0.02	95.5	-	402
CDA River	1997	DBSS	5/16/97	-	0.6	10	5.7	10.25	11.91	6.82	32.4	0.02	94.1	-	404
CDA River	1997	DBSS	5/16/97	-	0.6	9	6.7	10.25	11.76	6.82	32.3	0.02	93.8	-	404
CDA River	1997	DBSS	5/16/97	-	0.6	8	7.7	10.24	11.64	6.85	32.3	0.02	93.5	-	403
CDA River	1997	DBSS	5/16/97	-	0.6	7	8.7	10.33	11.31	6.93	32	0.02	93.7	-	400
CDA River	1997	DBSS	5/16/97	-	0.6	6	9.7	10.67	10.4	6.99	31	0.02	94.6	-	396
CDA River	1997	DBSS	5/16/97	-	0.6	5	10.7	11.02	9.42	7.01	29.6	0.02	95.5	-	394
CDA River	1997	DBSS	5/16/97	-	0.6	4	11.7	11	9.06	7.01	31.9	0.02	94.5	-	394
CDA River	1997	DBSS	5/16/97	-	0.6	3	12.7	10.99	8.88	7.01	32.5	0.02	94	-	393
CDA River	1997	DBSS	5/16/97	-	0.6	2	13.7	11.02	8.77	7.01	32.9	0.02	94	-	392

CDA River	1997	DBSS	5/16/97	-	0.6	1	14.7	10.97	8.73	7.01	33	0.02	93.5	-	395
CDA River	2197	DBSS	5/29/97	-	1.7	12	0.5	10.55	14.36	6.93	35.9	0.02	102.5	-	389
CDA River	2197	DBSS	5/29/97	-	1.7	11	1.4	10.7	13.83	6.95	35.4	0.02	102.8	-	389
CDA River	2197	DBSS	5/29/97	-	1.7	10	2.3	10.71	13.67	6.94	34.6	0.02	102.5	-	390
CDA River	2197	DBSS	5/29/97	-	1.7	9	3.5	10.8	12.2	6.92	35.6	0.02	100.1	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	8	4.3	10.8	12.05	6.91	35.7	0.02	99.8	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	7	5.4	10.8	12	6.91	35.8	0.02	99.6	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	6	6.3	10.78	11.94	6.91	35.8	0.02	99.3	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	5	7.3	10.77	11.92	6.91	35.8	0.02	99.2	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	4	8.3	10.65	11.2	6.94	33.3	0.02	96.4	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	3	9.3	10.87	9.58	7.01	27.5	0.02	94.7	-	389
CDA River	2197	DBSS	5/29/97	-	1.7	2	10.3	10.87	9.33	7.02	26.8	0.02	94.2	-	390
CDA River	2197	DBSS	5/29/97	-	1.7	1	11.4	10.86	9.33	7.01	27.1	0.02	94.1	-	392
CDA River	2397	DBAS	6/11/97	-	1.9	13	0.4	10.07	16.99	6.99	43.2	0.03	104	-	420
CDA River	2397	DBAS	6/11/97	-	1.9	12	1	10.06	15.56	7	44.3	0.03	100.8	-	420
CDA River	2397	DBAS	6/11/97	-	1.9	11	2	10.06	15.31	6.98	44.8	0.03	100.3	-	421
CDA River	2397	DBAS	6/11/97	-	1.9	10	2.9	10	14.53	6.97	45	0.03	98	-	422
CDA River	2397	DBAS	6/11/97	-	1.9	9	4	10.02	14.59	6.98	45.1	0.03	98.3	-	421
CDA River	2397	DBAS	6/11/97	-	1.9	8	5	10.06	14.36	6.99	44.7	0.03	98.2	-	421
CDA River	2397	DBAS	6/11/97	-	1.9	7	5.9	10.05	14.28	6.99	44	0.03	97.9	-	421
CDA River	2397	DBAS	6/11/97	-	1.9	6	6.9	10.52	12.6	7.03	36.9	0.02	98.7	-	419
CDA River	2397	DBAS	6/11/97	-	1.9	5	7.8	10.59	12.22	7.05	34.8	0.02	98.6	-	417
CDA River	2397	DBAS	6/11/97	-	1.9	4	8.9	10.94	11.51	7.08	30.8	0.02	100.1	-	415
CDA River	2397	DBAS	6/11/97	-	1.9	3	9.9	11.04	11.3	7.08	30.1	0.02	100.5	-	414
CDA River	2397	DBAS	6/11/97	-	1.9	2	10.9	11.08	11.25	7.07	29.2	0.02	100.8	-	414
CDA River	2397	DBAS	6/11/97	-	1.9	1	11.9	10.86	10.87	7.07	29.1	0.02	98.1	-	414
CDA River	2597	DBSS	6/26/97	-	2.2	13	0.3	10.46	14.23	7.08	45.3	0.03	101.7	-	435
CDA River	2597	DBSS	6/26/97	-	2.2	12	1.2	10.46	14.25	7.07	45.3	0.03	101.7	-	437
CDA River	2597	DBSS	6/26/97	-	2.2	11	2.3	10.45	14.16	7.05	45	0.03	101.5	-	438

CDA River	2597	DBSS	6/26/97	-	2.2	10	3.3	10.49	13.73	7.01	44.6	0.03	100.7	-	439
CDA River	2597	DBSS	6/26/97	-	2.2	9	4.2	10.47	13.6	7.03	42.4	0.03	100.4	-	437
CDA River	2597	DBSS	6/26/97	-	2.2	8	5.2	10.52	13.4	7.02	37.8	0.02	100.5	-	436
CDA River	2597	DBSS	6/26/97	-	2.2	7	6.2	10.56	12.5	7	34.2	0.02	98.8	-	436
CDA River	2597	DBSS	6/26/97	-	2.2	6	7.2	10.55	12.18	7	32.4	0.02	98	-	435
CDA River	2597	DBSS	6/26/97	-	2.2	5	8.3	10.45	11.41	7	30.5	0.02	95.3	-	435
CDA River	2597	DBSS	6/26/97	-	2.2	4	9	10.39	11.36	7	30.4	0.02	94.7	-	435
CDA River	2597	DBSS	6/26/97	-	2.2	3	10.2	10.39	11.33	6.99	30.4	0.02	94.7	-	434
CDA River	2597	DBSS	6/26/97	-	2.2	2	11.5	10.22	11.12	6.98	30.4	0.02	92.6	-	434
CDA River	2597	DBSS	6/26/97	-	2.2	1	12.6	10.07	10.82	7	30.6	0.02	90.6	-	433
CDA River	2797	DBSS	7/9/97	-	3.3	11	0.4	9.72	18.54	7.11	49.9	0.03	*****	-	421
CDA River	2797	DBSS	7/9/97	-	3.3	10	1.1	9.72	18.53	7.09	50	0.03	*****	-	421
CDA River	2797	DBSS	7/9/97	-	3.3	9	2.1	9.73	18.5	7.06	52.1	0.03	*****	-	422
CDA River	2797	DBSS	7/9/97	-	3.3	8	3	9.78	18.37	7	54.8	0.04	*****	-	424
CDA River	2797	DBSS	7/9/97	-	3.3	7	4.1	9.6	18.03	6.91	69.8	0.04	*****	-	428
CDA River	2797	DBSS	7/9/97	-	3.3	6	5	9.65	17.73	6.86	75.4	0.05	*****	-	430
CDA River	2797	DBSS	7/9/97	-	3.3	5	6	9.96	14.99	-	43	0.03	99.4	-	426
CDA River	2797	DBSS	7/9/97	-	3.3	4	7	10	13.1	6.94	34.1	0.02	95.7	-	425
CDA River	2797	DBSS	7/9/97	-	3.3	3	9	9.76	11.94	6.91	33.4	0.02	90.9	-	426
CDA River	2797	DBSS	7/9/97	-	3.3	2	10.1	9.75	11.82	6.92	33.4	0.02	90.6	-	426
CDA River	2797	DBSS	7/9/97	-	3.3	1	11	9.71	11.82	6.94	33.4	0.02	90.3	-	430
CDA River	2997	SSJD	7/24/97	-	4.5	12	0.5	9.38	21.69	7.49	39.8	0.03	*****	-	395
CDA River	2997	SSJD	7/24/97	-	4.5	11	1.2	9.4	21.37	7.46	42.7	0.03	*****	-	396
CDA River	2997	SSJD	7/24/97	-	4.5	10	2.3	9.4	21.33	7.4	48.4	0.03	*****	-	398
CDA River	2997	SSJD	7/24/97	-	4.5	9	3.2	9.4	21.33	7.37	50.1	0.03	*****	-	398
CDA River	2997	SSJD	7/24/97	-	4.5	8	4.2	9.4	21.3	7.33	51.3	0.03	*****	-	398
CDA River	2997	SSJD	7/24/97	-	4.5	7	5.3	9.42	21.11	7.26	49.9	0.03	*****	-	398
CDA River	2997	SSJD	7/24/97	-	4.5	6	6.2	9.33	20.67	7.11	58.2	0.04	*****	-	402
CDA River	2997	SSJD	7/24/97	-	4.5	5	7.2	10.2	16.19	7.12	35.9	0.02	*****	-	401
CDA River	2997	SSJD	7/24/97	-	4.5	4	8.2	9.82	15.19	7.02	34.9	0.02	97.2	-	403

CDA River	2997	SSJD	7/24/97	-	4.5	3	9.2	9.45	14.18	6.98	34	0.02	91.5	-	402
CDA River	2997	SSJD	7/24/97	-	4.5	2	10.2	9.28	13.84	0	34	0.02	89.2	-	400
CDA River	2997	SSJD	7/24/97	-	4.5	1	11.2	8.84	13.68	7.01	34.2	0.02	84.7	-	397
CDA River	3197	DBSS	8/5/97	-	5.5	11	0.4	9.38	25.18	7.65	61.4	0.04	112.4	-	359
CDA River	3197	DBSS	8/5/97	-	5.5	10	1.1	9.29	24.06	7.58	53.3	0.03	109	-	361
CDA River	3197	DBSS	8/5/97	-	5.5	9	2.1	9.23	23.67	7.54	50.8	0.03	107.6	-	362
CDA River	3197	DBSS	8/5/97	-	5.5	8	3.2	9.1	23.53	7.5	46.6	0.03	105.8	-	363
CDA River	3197	DBSS	8/5/97	-	5.5	7	4.2	9.14	23.26	7.46	46.6	0.03	105.8	-	365
CDA River	3197	DBSS	8/5/97	-	5.5	6	5.2	9.22	23.15	7.39	49.1	0.03	106.3	-	366
CDA River	3197	DBSS	8/5/97	-	5.5	5	6	10.06	19.97	7.38	41.6	0.03	109.2	-	367
CDA River	3197	DBSS	8/5/97	-	5.5	4	7.1	9.71	19.4	7.31	42.1	0.03	0	-	369
CDA River	3197	DBSS	8/5/97	-	5.5	3	8	9.81	18.17	7.33	38.3	0.02	102.7	-	368
CDA River	3197	DBSS	8/5/97	-	5.5	2	8.9	10.49	17.23	7.35	36.1	0.02	107.7	-	366
CDA River	3197	DBSS	8/5/97	-	5.5	1	10	9.81	16.75	7.32	36.6	0.02	99.7	-	368
CDA River	3297	DBSS	8/13/97	-	6	10	0.2	8.82	23.38	7.74	54.8	0.04	102.8	-	363
CDA River	3297	DBSS	8/13/97	-	6	9	0.7	8.77	23.13	7.65	53.9	0.03	101.8	-	369
CDA River	3297	DBSS	8/13/97	-	6	8	1.7	8.74	22.74	7.66	47.7	0.03	100.7	-	368
CDA River	3297	DBSS	8/13/97	-	6	7	2.7	8.8	22.65	7.68	50.3	0.03	101.3	-	367
CDA River	3297	DBSS	8/13/97	-	6	6	3.7	8.88	22.63	7.66	52.9	0.03	102.2	-	367
CDA River	3297	DBSS	8/13/97	-	6	5	4.7	8.91	22.33	7.64	56	0.04	101.9	-	367
CDA River	3297	DBSS	8/13/97	-	6	4	5.6	8.95	22.24	7.58	61.9	0.04	102.2	-	368
CDA River	3297	DBSS	8/13/97	-	6	3	6.7	8.95	22.08	7.3	67.3	0.04	101.8	-	375
CDA River	3297	DBSS	8/13/97	-	6	2	7.7	8.67	19.88	7.15	46.5	0.03	94.5	-	381
CDA River	3297	DBSS	8/13/97	-	6	1	8.7	8.73	17.78	7.14	39.5	0.03	91.2	-	382
CDA River	3497	DBSS	8/27/97	-	6.1	13	0.3	9.13	20.86	7.53	52.7	0.03	101.5	-	346
CDA River	3497	DBSS	8/27/97	-	6.1	12	0.9	9.14	20.84	7.54	52.6	0.03	101.7	-	345
CDA River	3497	DBSS	8/27/97	-	6.1	11	2	9.14	20.84	7.54	52.5	0.03	101.7	-	344
CDA River	3497	DBSS	8/27/97	-	6.1	10	2.9	9.14	20.83	7.54	53.3	0.03	101.7	-	344
CDA River	3497	DBSS	8/27/97	-	6.1	9	4	9.14	20.81	7.52	55.2	0.04	101.6	-	345

CDA River	3497	DBSS	8/27/97	-	6.1	8	5.1	9.12	20.81	7.5	55.4	0.04	101.4	-	345
CDA River	3497	DBSS	8/27/97	-	6.1	7	6.1	9.11	20.77	7.48	58	0.04	101.2	-	346
CDA River	3497	DBSS	8/27/97	-	6.1	6	6.9	9.08	20.76	7.47	58.3	0.04	100.9	-	345
CDA River	3497	DBSS	8/27/97	-	6.1	5	7.9	9.09	20.72	7.44	60	0.04	100.9	-	346
CDA River	3497	DBSS	8/27/97	-	6.1	4	9	9.06	20.69	7.41	59.8	0.04	100.4	-	346
CDA River	3497	DBSS	8/27/97	-	6.1	3	10	9.03	20.67	7.39	59.1	0.04	100.2	-	345
CDA River	3497	DBSS	8/27/97	-	6.1	2	10.9	8.92	20.56	7.37	59	0.04	98.7	-	345
CDA River	3497	DBSS	8/27/97	-	6.1	1	12	8.08	16.69	7.11	42.1	0.03	82.6	-	359
CDA River	3797	ASRP	9/17/97	-	5.5	11	0.1	9.38	17.47	7.44	58.9	0.04	99.1	-	370
CDA River	3797	ASRP	9/17/97	-	5.5	10	1	9.32	17.49	7.43	58.9	0.04	98.4	-	369
CDA River	3797	ASRP	9/17/97	-	5.5	9	2	9.24	17.48	7.45	59.1	0.04	97.6	-	368
CDA River	3797	ASRP	9/17/97	-	5.5	8	3	9.35	17.49	7.42	59	0.04	98.8	-	369
CDA River	3797	ASRP	9/17/97	-	5.5	7	4	9.37	17.48	7.4	59.6	0.04	99	-	369
CDA River	3797	ASRP	9/17/97	-	5.5	6	5	9.35	17.49	7.39	59.3	0.04	98.8	-	369
CDA River	3797	ASRP	9/17/97	-	5.5	5	6	9.29	17.48	7.37	59.8	0.04	97.9	-	368
CDA River	3797	ASRP	9/17/97	-	5.5	4	7	9.28	17.43	7.34	61	0.04	97.8	-	368
CDA River	3797	ASRP	9/17/97	-	5.5	3	8	9.19	17.44	7.22	61	0.04	97	-	369
CDA River	3797	ASRP	9/17/97	-	5.5	2	9	8.59	9.82	7.04	50.3	0.03	76.9	-	380
CDA River	3797	ASRP	9/17/97	-	5.5	1	10.1	8.38	9.79	6.96	52.8	0.03	74.6	-	385
CDA River	3997	ASRA	9/29/97	-	6	11	0.2	9.72	16.01	7.37	52.6	0.03	99.4	-	414
CDA River	3997	ASRA	9/29/97	-	6	10	1.8	9.66	15.76	7.36	52.2	0.03	98.4	-	415
CDA River	3997	ASRA	9/29/97	-	6	9	2.8	9.66	15.71	7.33	53.3	0.03	98.3	-	415
CDA River	3997	ASRA	9/29/97	-	6	8	3.8	9.62	15.66	7.31	53.9	0.03	97.8	-	415
CDA River	3997	ASRA	9/29/97	-	6	7	4.8	9.59	15.61	7.29	53.4	0.03	97.4	-	415
CDA River	3997	ASRA	9/29/97	-	6	6	5.9	9.56	15.54	7.26	53.8	0.03	97	-	414
CDA River	3997	ASRA	9/29/97	-	6	5	6.8	9.62	15.52	7.23	56.7	0.04	97.5	-	414
CDA River	3997	ASRA	9/29/97	-	6	4	7.8	9.74	15.12	7.15	64.5	0.04	97.9	-	416
CDA River	3997	ASRA	9/29/97	-	6	3	8.8	9.62	14.99	7.03	68	0.04	96.5	-	419
CDA River	3997	ASRA	9/29/97	-	6	2	9.8	7.74	12.13	6.9	48.6	0.03	72.8	-	425
CDA River	3997	ASRA	9/29/97	-	6	1	10.8	7.85	10.26	6.97	44.5	0.03	70.6	-	424

CDA River	4297	DBAS	10/21/97	-	6	11	0.3	10.11	11.79	7.24	54.6	0.03	92.3	-	371
CDA River	4297	DBAS	10/21/97	-	6	10	1	10.1	11.81	7.27	54.6	0.03	92.2	-	369
CDA River	4297	DBAS	10/21/97	-	6	9	2	10.11	11.81	7.23	54.8	0.04	92.4	-	370
CDA River	4297	DBAS	10/21/97	-	6	8	3	10.08	11.81	7.24	54.7	0.04	92.1	-	369
CDA River	4297	DBAS	10/21/97	-	6	7	4.1	10.12	11.77	7.22	55.3	0.04	92.4	-	369
CDA River	4297	DBAS	10/21/97	-	6	6	5	10.13	11.74	7.19	55.7	0.04	92.4	-	370
CDA River	4297	DBAS	10/21/97	-	6	5	6	10.16	11.68	7.18	56.7	0.04	92.5	-	370
CDA River	4297	DBAS	10/21/97	-	6	4	7	10.17	11.59	7.17	57.9	0.04	92.5	-	369
CDA River	4297	DBAS	10/21/97	-	6	3	8	10.17	11.59	7.13	57.9	0.04	92.5	-	370
CDA River	4297	DBAS	10/21/97	-	6	2	9	10.22	11.41	7.1	63.2	0.04	92.5	-	371
CDA River	4297	DBAS	10/21/97	-	6	1	10	10.23	10.94	7.01	81.3	0.05	91.6	-	379
CDA River	4497	DBAS	11/4/97	-	3.8	11	0.4	10.87	10.02	7.35	53.9	0.03	95.5	54	392
CDA River	4497	DBAS	11/4/97	-	3.8	10	1.5	10.94	9.79	7.34	53.7	0.03	95.5	50	393
CDA River	4497	DBAS	11/4/97	-	3.8	9	2.5	10.87	9.79	7.37	53.7	0.03	94.9	146	392
CDA River	4497	DBAS	11/4/97	-	3.8	8	3.5	10.92	9.74	7.33	53.6	0.03	95.3	51	393
CDA River	4497	DBAS	11/4/97	-	3.8	7	4.5	10.88	9.68	7.28	53.7	0.03	94.8	102	395
CDA River	4497	DBAS	11/4/97	-	3.8	6	5.5	10.9	9.4	7.21	54.5	0.03	94.3	59	398
CDA River	4497	DBAS	11/4/97	-	3.8	5	6.5	10.91	9.38	7.26	54.6	0.03	94.3	121	395
CDA River	4497	DBAS	11/4/97	-	3.8	4	7.5	11	9.25	7.19	54.9	0.04	94.8	49	398
CDA River	4497	DBAS	11/4/97	-	3.8	3	8.5	11.23	8.55	7.14	57.3	0.04	95.1	42	401
CDA River	4497	DBAS	11/4/97	-	3.8	2	9.5	11.29	8.25	7.12	58.2	0.04	95	59	402
CDA River	4497	DBAS	11/4/97	-	3.8	1	10.5	11.26	8.17	7.1	58.6	0.04	94.5	536	404

Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
Mid Lake	1597	ASSS	4/18/97	-	2	10	0.4	12.33	6.36	7.36	44.6	0.03	99.9	-	377

Mid Lake	1597	ASSS	4/18/97	-	2	9	1.4	12.36	6.3	7.35	45.2	0.03	*****	-	378
Mid Lake	1597	ASSS	4/18/97	-	2	8	2.6	12.27	6.33	7.35	44.4	0.03	99.4	-	379
Mid Lake	1597	ASSS	4/18/97	-	2	7	3.8	12.31	6.28	7.34	45.3	0.03	99.6	-	379
Mid Lake	1597	ASSS	4/18/97	-	2	6	5.1	12.32	6.3	7.34	45.4	0.03	99.7	-	379
Mid Lake	1597	ASSS	4/18/97	-	2	5	6.4	12.35	6.31	7.34	44.9	0.03	*****	-	379
Mid Lake	1597	ASSS	4/18/97	-	2	4	7.5	12.43	6.31	7.33	44.6	0.03	*****	-	379
Mid Lake	1597	ASSS	4/18/97	-	2	3	8.7	12.4	6.31	7.33	44.7	0.03	*****	-	378
Mid Lake	1597	ASSS	4/18/97	-	2	2	10.1	12.44	6.26	7.32	44.8	0.03	*****	-	379
Mid Lake	1597	ASSS	4/18/97	-	2	1	11.2	12.57	6.28	7.32	44.8	0.03	*****	-	378
Mid Lake	1997	DBAC	5/16/97	-	1.25	15	0.2	12.04	13.83	6.33	0.7	0	115.5	-	422
Mid Lake	1997	DBAC	5/16/97	-	1.25	14	1.5	11.12	10.32	7	28.2	0.02	98.5	-	392
Mid Lake	1997	DBAC	5/16/97	-	1.25	13	3	11.1	9.86	7	28.8	0.02	97.3	-	392
Mid Lake	1997	DBAC	5/16/97	-	1.25	12	4.5	11.16	9.79	6.99	28.3	0.02	97.5	-	392
Mid Lake	1997	DBAC	5/16/97	-	1.25	11	6	11.1	9.51	6.98	29	0.02	96.4	-	393
Mid Lake	1997	DBAC	5/16/97	-	1.25	10	7.5	11.04	9.25	6.98	29.4	0.02	95.3	-	392
Mid Lake	1997	DBAC	5/16/97	-	1.25	9	9	11.04	9.17	6.99	29.6	0.02	95	-	391
Mid Lake	1997	DBAC	5/16/97	-	1.25	8	10.5	11.08	8.92	7.02	30.7	0.02	94.8	-	389
Mid Lake	1997	DBAC	5/16/97	-	1.25	7	12	11.29	8.45	7.01	33.4	0.02	95.6	-	389
Mid Lake	1997	DBAC	5/16/97	-	1.25	6	13.5	11.32	7.81	6.99	34.7	0.02	94.3	-	390
Mid Lake	1997	DBAC	5/16/97	-	1.25	5	15	11.28	7.47	6.98	34.9	0.02	93.2	-	389
Mid Lake	1997	DBAC	5/16/97	-	1.25	4	16.5	11.25	6.66	6.96	37.2	0.02	91.1	-	390
Mid Lake	1997	DBAC	5/16/97	-	1.25	3	18	11.12	6.08	6.94	40.1	0.03	88.7	-	391
Mid Lake	1997	DBAC	5/16/97	-	1.25	2	19.5	11.15	5.69	6.93	45.9	0.03	88.1	-	391
Mid Lake	1997	DBAC	5/16/97	-	1.25	1	20.9	10.91	5.6	6.92	47.2	0.03	85.9	-	390
Mid Lake	2197	DBSS	5/29/97	-	1.7	13	0.2	11.32	12.63	7.06	27.6	0.02	105.9	-	351
Mid Lake	2197	DBSS	5/29/97	-	1.7	12	0.9	11.33	12.51	7.05	27.6	0.02	105.8	-	352
Mid Lake	2197	DBSS	5/29/97	-	1.7	11	2.5	11.19	10.72	7	26.8	0.02	100.2	-	353
Mid Lake	2197	DBSS	5/29/97	-	1.7	10	4	10.83	10.3	6.97	26.6	0.02	96	-	354
Mid Lake	2197	DBSS	5/29/97	-	1.7	9	5.5	10.7	10.07	6.96	26.4	0.02	94.4	-	353
Mid Lake	2197	DBSS	5/29/97	-	1.7	8	7	10.68	9.64	6.95	26.3	0.02	93.2	-	352

Mid Lake	2197	DBSS	5/29/97	-	1.7	7	8.5	10.71	9.45	6.95	26.5	0.02	93	-	349
Mid Lake	2197	DBSS	5/29/97	-	1.7	6	9.9	10.73	9.25	6.96	26.6	0.02	92.8	-	348
Mid Lake	2197	DBSS	5/29/97	-	1.7	5	12.5	10.75	8.84	6.95	27	0.02	92	-	346
Mid Lake	2197	DBSS	5/29/97	-	1.7	4	14.4	10.82	8.38	6.94	28.3	0.02	91.6	-	343
Mid Lake	2197	DBSS	5/29/97	-	1.7	3	16.1	10.73	7.96	6.92	30.2	0.02	89.9	-	342
Mid Lake	2197	DBSS	5/29/97	-	1.7	2	18.7	10.48	6.49	6.87	40.5	0.03	84.7	-	339
Mid Lake	2197	DBSS	5/29/97	-	1.7	1	20.2	10.17	6.71	6.87	40.7	0.03	82.6	-	332
Mid Lake	2397	DBAS	6/11/97	-	2	14	0.4	10.81	15.76	7.1	30.6	0.02	108.8	-	411
Mid Lake	2397	DBAS	6/11/97	-	2	13	1.3	10.86	15.58	7.11	30.7	0.02	108.9	-	411
Mid Lake	2397	DBAS	6/11/97	-	2	12	2.9	10.9	13.8	7.1	29.8	0.02	105.2	-	411
Mid Lake	2397	DBAS	6/11/97	-	2	11	4.3	10.86	13.09	7.05	29.4	0.02	103	-	414
Mid Lake	2397	DBAS	6/11/97	-	2	10	5.9	11.2	11.54	7.04	28.9	0.02	102.6	-	415
Mid Lake	2397	DBAS	6/11/97	-	2	9	7.4	11	10.45	7.02	29	0.02	98.2	-	416
Mid Lake	2397	DBAS	6/11/97	-	2	8	9	10.92	10.12	7	28.6	0.02	96.8	-	417
Mid Lake	2397	DBAS	6/11/97	-	2	7	10.5	10.84	9.71	6.99	28.6	0.02	95.2	-	417
Mid Lake	2397	DBAS	6/11/97	-	2	6	11.9	10.62	8.94	6.96	31.6	0.02	91.4	-	419
Mid Lake	2397	DBAS	6/11/97	-	2	5	13.4	10.6	8.42	6.95	34.4	0.02	90.1	-	420
Mid Lake	2397	DBAS	6/11/97	-	2	4	15	10.23	7.81	6.92	37.7	0.02	85.7	-	421
Mid Lake	2397	DBAS	6/11/97	-	2	3	16.4	10.36	7.05	6.92	41.9	0.03	85.2	-	421
Mid Lake	2397	DBAS	6/11/97	-	2	2	17.9	10.31	6.82	6.92	43.2	0.03	84.3	-	425
Mid Lake	2397	DBAS	6/11/97	-	2	1	19.5	10.02	6.99	6.93	43.2	0.03	82.3	-	424
Mid Lake	2597	DBSS	6/26/97	-	3	13	0.4	10.7	15.09	7.14	31.7	0.02	106.1	-	405
Mid Lake	2597	DBSS	6/26/97	-	3	12	1.9	10.69	14.89	7.12	31.8	0.02	105.4	-	405
Mid Lake	2597	DBSS	6/26/97	-	3	11	3.5	10.74	14.36	7.1	31.9	0.02	104.8	-	406
Mid Lake	2597	DBSS	6/26/97	-	3	10	5	10.68	13.32	6.97	30.2	0.02	101.8	-	410
Mid Lake	2597	DBSS	6/26/97	-	3	9	6.6	10.73	12.33	6.96	30.5	0.02	100	-	410
Mid Lake	2597	DBSS	6/26/97	-	3	8	8.1	10.36	11.45	6.92	30.4	0.02	94.6	-	411
Mid Lake	2597	DBSS	6/26/97	-	3	7	9.6	10.26	10.59	6.89	29.6	0.02	91.8	-	412
Mid Lake	2597	DBSS	6/26/97	-	3	6	10.9	10.14	9.27	6.86	30.8	0.02	88	-	413
Mid Lake	2597	DBSS	6/26/97	-	3	5	12.5	10.11	8.25	6.83	34.6	0.02	85.6	-	414

Mid Lake	2597	DBSS	6/26/97	-	3	4	14	9.57	7.53	6.81	38	0.02	79.6	-	414
Mid Lake	2597	DBSS	6/26/97	-	3	3	15.6	9.44	7.05	6.8	40.5	0.03	77.7	-	413
Mid Lake	2597	DBSS	6/26/97	-	3	2	17	9.03	6.82	6.8	42.4	0.03	73.8	-	411
Mid Lake	2597	DBSS	6/26/97	-	3	1	18.6	9.08	6.81	6.86	42.4	0.03	74.1	-	407
Mid Lake	2797	DBSS	7/8/97	-	2.4	13	0.3	9.95	19.4	7.02	35.5	0.02	*****	-	444
Mid Lake	2797	DBSS	7/8/97	-	2.4	12	1.7	10.11	17.84	7	34.8	0.02	*****	-	445
Mid Lake	2797	DBSS	7/8/97	-	2.4	11	3.3	10.29	17.17	6.92	35	0.02	*****	-	447
Mid Lake	2797	DBSS	7/8/97	-	2.4	10	4.8	10.55	14.84	6.81	38.2	0.02	*****	-	451
Mid Lake	2797	DBSS	7/8/97	-	2.4	9	6.2	10.41	13.81	6.77	35.6	0.02	99.9	-	451
Mid Lake	2797	DBSS	7/8/97	-	2.4	8	7.8	10.26	13.02	6.7	34.6	0.02	96.7	-	451
Mid Lake	2797	DBSS	7/8/97	-	2.4	7	9.2	10.03	12.2	6.66	33.4	0.02	92.8	-	451
Mid Lake	2797	DBSS	7/8/97	-	2.4	6	10.8	9.78	10.8	6.6	33.3	0.02	87.6	-	450
Mid Lake	2797	DBSS	7/8/97	-	2.4	5	12.2	9.53	9.76	6.57	34.5	0.02	83.3	-	450
Mid Lake	2797	DBSS	7/8/97	-	2.4	4	13.7	9.55	8.95	6.54	36.6	0.02	82	-	448
Mid Lake	2797	DBSS	7/8/97	-	2.4	3	15.3	9.33	8.46	6.52	38.2	0.02	79.1	-	447
Mid Lake	2797	DBSS	7/8/97	-	2.4	2	16.6	9.28	7.91	6.49	39.8	0.03	77.7	-	445
Mid Lake	2797	DBSS	7/8/97	-	2.4	1	18.2	9.37	7.51	6.47	42	0.03	77.6	-	447
Mid Lake	2997	SSJD	7/24/97	-	4.5	13	1.3	9.57	21.01	7.48	38.8	0.02	*****	-	394
Mid Lake	2997	SSJD	7/24/97	-	4.5	12	2.8	9.92	20.47	7.43	37.9	0.02	*****	-	393
Mid Lake	2997	SSJD	7/24/97	-	4.5	11	4.3	10.52	17.56	7.27	37.7	0.02	*****	-	400
Mid Lake	2997	SSJD	7/24/97	-	4.5	10	5.8	10.49	16.73	7.18	36.2	0.02	*****	-	402
Mid Lake	2997	SSJD	7/24/97	-	4.5	9	7.3	10.22	15.79	7.03	35.2	0.02	*****	-	406
Mid Lake	2997	SSJD	7/24/97	-	4.5	8	8.8	9.96	15.01	6.95	34.4	0.02	98.2	-	408
Mid Lake	2997	SSJD	7/24/97	-	4.5	7	10.3	9.14	13.61	6.84	33.2	0.02	87.5	-	411
Mid Lake	2997	SSJD	7/24/97	-	4.5	6	11.8	9.33	11.29	6.79	33.2	0.02	84.6	-	414
Mid Lake	2997	SSJD	7/24/97	-	4.5	5	13.3	8.89	9.48	6.78	35.2	0.02	77.3	-	414
Mid Lake	2997	SSJD	7/24/97	-	4.5	4	14.3	9.1	8.22	6.8	37.7	0.02	76.7	-	413
Mid Lake	2997	SSJD	7/24/97	-	4.5	3	15.8	9.07	8.17	6.83	37.8	0.02	76.4	-	411
Mid Lake	2997	SSJD	7/24/97	-	4.5	2	17.3	9.15	7.95	6.87	38.3	0.02	76.6	-	414
Mid Lake	2997	SSJD	7/24/97	-	4.5	1	18.8	9.24	7.46	6.93	39.7	0.03	76.2	-	422

Mid Lake	3197	DBSS	8/5/97	-	5.6	14	0.4	9.23	24.49	7.8	41.3	0.03	109.2	-	345
Mid Lake	3197	DBSS	8/5/97	-	5.6	13	1	9.29	23.73	7.7	41.5	0.03	108.4	-	348
Mid Lake	3197	DBSS	8/5/97	-	5.6	12	2.6	9.34	22.74	7.49	43.4	0.03	106.9	-	354
Mid Lake	3197	DBSS	8/5/97	-	5.6	11	4	9.57	21.92	7.41	49.1	0.03	107.8	-	357
Mid Lake	3197	DBSS	8/5/97	-	5.6	10	5.5	9.89	20.76	7.43	41.8	0.03	108.9	-	354
Mid Lake	3197	DBSS	8/5/97	-	5.6	9	7	10.15	19.78	7.29	39.8	0.03	109.7	-	356
Mid Lake	3197	DBSS	8/5/97	-	5.6	8	8.6	10.13	17.86	7.05	36.9	0.02	105.4	-	361
Mid Lake	3197	DBSS	8/5/97	-	5.6	7	10	9.33	15.01	6.96	34.5	0.02	91.3	-	364
Mid Lake	3197	DBSS	8/5/97	-	5.6	6	11.5	8.92	12.66	6.9	34.4	0.02	82.9	-	364
Mid Lake	3197	DBSS	8/5/97	-	5.6	5	13.1	8.74	10.18	6.88	35.9	0.02	76.7	-	361
Mid Lake	3197	DBSS	8/5/97	-	5.6	4	14.5	8.58	9.05	6.91	37.2	0.02	73.3	-	357
Mid Lake	3197	DBSS	8/5/97	-	5.6	3	16.1	8.76	8.04	6.94	38.9	0.02	73	-	354
Mid Lake	3197	DBSS	8/5/97	-	5.6	2	17.5	8.83	7.94	6.99	39	0.03	73.5	-	347
Mid Lake	3197	DBSS	8/5/97	-	5.6	1	18.9	8.88	8.18	7.08	39	0.03	74	-	374
Mid Lake	3297	DBSS	8/13/97	-	6.5	13	0.5	8.7	22.93	7.65	45.4	0.03	100.6	-	361
Mid Lake	3297	DBSS	8/13/97	-	6.5	12	2	8.72	22.56	7.6	45.2	0.03	100.1	-	362
Mid Lake	3297	DBSS	8/13/97	-	6.5	11	3.5	8.77	22.29	7.56	45	0.03	100.2	-	362
Mid Lake	3297	DBSS	8/13/97	-	6.5	10	5	8.81	22.12	7.44	45	0.03	100.4	-	365
Mid Lake	3297	DBSS	8/13/97	-	6.5	9	6.5	8.87	21.44	7.28	49.4	0.03	99.7	-	370
Mid Lake	3297	DBSS	8/13/97	-	6.5	8	8	9.05	20.09	7.19	42.6	0.03	99.1	-	373
Mid Lake	3297	DBSS	8/13/97	-	6.5	7	9.5	9.2	18.61	7.05	38.7	0.02	97.7	-	374
Mid Lake	3297	DBSS	8/13/97	-	6.5	6	11	8.12	14.03	6.91	35.4	0.02	78.3	-	379
Mid Lake	3297	DBSS	8/13/97	-	6.5	5	12.5	7.96	10.62	6.9	36.8	0.02	71.1	-	380
Mid Lake	3297	DBSS	8/13/97	-	6.5	4	14	7.79	9.22	6.93	38.5	0.02	67.3	-	378
Mid Lake	3297	DBSS	8/13/97	-	6.5	3	15.5	7.71	8.49	6.97	39.3	0.03	65.4	-	376
Mid Lake	3297	DBSS	8/13/97	-	6.5	2	17	7.29	8.15	7.08	40.1	0.03	61.3	-	370
Mid Lake	3297	DBSS	8/13/97	-	6.5	1	18.7	8.21	7.69	6.92	41.3	0.03	68.3	-	393
Mid Lake	3497	DBSS	8/27/97	-	8	13	0.4	9.08	21.49	7.54	50.5	0.03	102.3	-	353
Mid Lake	3497	DBSS	8/27/97	-	8	12	1.1	9.08	21.48	7.54	50.4	0.03	102.2	-	353

Mid Lake	3497	DBSS	8/27/97	-	8	11	2.4	9.08	21.42	7.53	50.4	0.03	102.1	-	353
Mid Lake	3497	DBSS	8/27/97	-	8	10	4.1	9.09	21.28	7.52	50.7	0.03	102	-	353
Mid Lake	3497	DBSS	8/27/97	-	8	9	5.6	9.1	21.18	7.5	50.7	0.03	101.9	-	353
Mid Lake	3497	DBSS	8/27/97	-	8	8	6.9	9.1	21.11	7.46	50.7	0.03	101.7	-	354
Mid Lake	3497	DBSS	8/27/97	-	8	7	8.5	8.96	21.05	7.33	49.9	0.03	100.1	-	358
Mid Lake	3497	DBSS	8/27/97	-	8	6	10	8.48	20.3	7.17	48.7	0.03	93.4	-	363
Mid Lake	3497	DBSS	8/27/97	-	8	5	11.5	8.19	19.32	7.01	45.8	0.03	88.4	-	370
Mid Lake	3497	DBSS	8/27/97	-	8	4	12.9	8.39	15.84	6.91	40.1	0.03	84.2	-	375
Mid Lake	3497	DBSS	8/27/97	-	8	3	14.4	6.45	12.02	6.88	40.9	0.03	59.5	-	379
Mid Lake	3497	DBSS	8/27/97	-	8	2	15.9	6.81	9.48	6.95	42.1	0.03	59.2	-	377
Mid Lake	3497	DBSS	8/27/97	-	8	1	17.4	6.69	9.22	7.07	42.6	0.03	57.8	-	373
Mid Lake	3797	ASRP	9/17/97	-	5	11	0.2	8.99	16.75	7.02	49.9	0.03	93.5	-	384
Mid Lake	3797	ASRP	9/17/97	-	5	10	1	8.9	16.75	6.94	49.9	0.03	92.6	-	386
Mid Lake	3797	ASRP	9/17/97	-	5	9	3	8.75	16.43	6.79	49.7	0.03	90.4	-	392
Mid Lake	3797	ASRP	9/17/97	-	5	8	5	8.08	10.87	6.71	43.5	0.03	73.4	-	398
Mid Lake	3797	ASRP	9/17/97	-	5	7	7	8.27	9.37	6.69	42.7	0.03	72.8	-	399
Mid Lake	3797	ASRP	9/17/97	-	5	6	9	8.19	8.88	6.7	43.4	0.03	71.3	-	399
Mid Lake	3797	ASRP	9/17/97	-	5	5	10.9	9	7.66	6.71	43.9	0.03	76.1	-	398
Mid Lake	3797	ASRP	9/17/97	-	5	4	13	8.96	7.58	6.74	44.1	0.03	75.6	-	396
Mid Lake	3797	ASRP	9/17/97	-	5	3	15	9.05	7.43	6.75	44.2	0.03	76.2	-	395
Mid Lake	3797	ASRP	9/17/97	-	5	2	16.9	9.45	7.12	6.78	44.6	0.03	78.8	-	393
Mid Lake	3797	ASRP	9/17/97	-	5	1	18.6	9.41	6.89	6.84	45.1	0.03	78	-	390
Mid Lake	3997	ASRA	9/29/97	-	6.5	10	0.5	9.59	16.46	7.17	50.6	0.03	99.2	-	407
Mid Lake	3997	ASRA	9/29/97	-	6.5	9	2.7	9.45	15.86	7.07	50.1	0.03	96.5	-	411
Mid Lake	3997	ASRA	9/29/97	-	6.5	8	4.6	9.24	15.24	6.92	50.3	0.03	93.1	-	417
Mid Lake	3997	ASRA	9/29/97	-	6.5	7	6.6	8.62	13.82	6.82	49.6	0.03	84.2	-	421
Mid Lake	3997	ASRA	9/29/97	-	6.5	6	8.6	8.64	12.23	6.78	46.7	0.03	81.4	-	423
Mid Lake	3997	ASRA	9/29/97	-	6.5	5	10.6	8.58	9.81	6.74	42.5	0.03	76.4	-	425
Mid Lake	3997	ASRA	9/29/97	-	6.5	4	12.6	8.65	8.46	6.74	42	0.03	74.5	-	424
Mid Lake	3997	ASRA	9/29/97	-	6.5	3	14.6	9.04	7.79	6.74	42	0.03	77.4	-	424

Mid Lake	3997	ASRA	9/29/97	-	6.5	2	16.6	8.92	7.46	6.81	42.2	0.03	75	-	420
Mid Lake	3997	ASRA	9/29/97	-	6.5	1	18.6	8.91	7.47	6.87	42.1	0.03	75	-	417
Mid Lake	4297	DBAS	10/22/97	-	4.6	10	0.2	10.5	11.58	7.09	49	0.03	96	-	413
Mid Lake	4297	DBAS	10/22/97	-	4.6	9	2	10.48	11.59	7.1	48.9	0.03	95.8	-	412
Mid Lake	4297	DBAS	10/22/97	-	4.6	8	4	10.47	11.59	7.06	49.1	0.03	95.7	-	413
Mid Lake	4297	DBAS	10/22/97	-	4.6	7	6	10.45	11.58	7.02	49.1	0.03	95.5	-	414
Mid Lake	4297	DBAS	10/22/97	-	4.6	6	8	10.43	11.59	7	49.2	0.03	95.3	-	414
Mid Lake	4297	DBAS	10/22/97	-	4.6	5	10	10.42	11.58	6.94	49.2	0.03	95.2	-	415
Mid Lake	4297	DBAS	10/22/97	-	4.6	4	12	10.4	11.56	6.88	49.2	0.03	95	-	417
Mid Lake	4297	DBAS	10/22/97	-	4.6	3	14	10.37	11.56	6.82	49.2	0.03	94.8	-	418
Mid Lake	4297	DBAS	10/22/97	-	4.6	2	16	10.21	11.51	6.69	49.3	0.03	93.2	-	421
Mid Lake	4297	DBAS	10/22/97	-	4.6	1	18	4.53	8.53	6.32	45.1	0.03	38.5	-	434
Mid Lake	4497	DBAS	11/4/97	-	4	13	0.5	10.64	10.18	7.08	53.4	0.03	93.8	104	396
Mid Lake	4497	DBAS	11/4/97	-	4	12	2	10.49	9.51	7.02	53.4	0.03	91	56	398
Mid Lake	4497	DBAS	11/4/97	-	4	11	3.5	10.25	9.4	6.97	53.7	0.03	88.7	55	401
Mid Lake	4497	DBAS	11/4/97	-	4	10	5	10.05	9.32	6.94	53.7	0.03	86.7	49	401
Mid Lake	4497	DBAS	11/4/97	-	4	9	6.5	9.89	9.24	6.9	53.4	0.03	85.2	120	402
Mid Lake	4497	DBAS	11/4/97	-	4	8	8	8.86	9.01	6.85	52.9	0.03	75.9	119	403
Mid Lake	4497	DBAS	11/4/97	-	4	7	9.5	9.57	8.71	6.85	54.6	0.03	81.4	102	403
Mid Lake	4497	DBAS	11/4/97	-	4	6	11	9.28	8.6	6.84	53.2	0.03	78.8	58	403
Mid Lake	4497	DBAS	11/4/97	-	4	5	12.5	9.13	8.5	6.79	52.6	0.03	77.3	102	405
Mid Lake	4497	DBAS	11/4/97	-	4	4	14	9.01	8.43	6.75	52.1	0.03	76.2	227	406
Mid Lake	4497	DBAS	11/4/97	-	4	3	15.5	8.76	7.68	6.72	47.9	0.03	72.6	51	407
Mid Lake	4497	DBAS	11/4/97	-	4	2	17	8.81	7.38	6.72	46.3	0.03	72.6	58	408
Mid Lake	4497	DBAS	11/4/97	-	4	1	18.4	8.78	7.27	6.75	46.2	0.03	72.1	713	407
Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
Carey Bay	1597	ASSS	4/18/97	-	1.9	10	0.4	12.31	6.22	7.43	38.4	0.02	99.4	-	374
Carey Bay	1597	ASSS	4/18/97	-	1.9	9	1	12.3	6.07	7.41	38.5	0.02	99	-	375

Carey Bay	1597	ASSS	4/18/97	-	1.9	8	2	12.29	5.77	7.41	38.2	0.02	98.1	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	7	3.1	12.21	5.64	7.41	38.4	0.02	97.2	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	6	4.3	12.2	5.6	7.4	38.3	0.02	97	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	5	5.5	12.14	5.57	7.39	38.2	0.02	96.6	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	4	6.8	12.15	5.56	7.39	38.3	0.02	96.5	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	3	8.1	12.12	5.54	7.38	38.4	0.02	96.2	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	2	9.3	12.12	5.49	7.38	38.4	0.02	96.1	-	374
Carey Bay	1597	ASSS	4/18/97	-	1.9	1	10.5	12.09	5.47	7.37	38.5	0.02	95.8	-	374
Carey Bay	1997	DBAC	5/16/97	-	1.6	12	0.2	11.52	15.54	7.11	35.1	0.02	114.7	-	389
Carey Bay	1997	DBAC	5/16/97	-	1.6	11	1	11.94	11.22	7.15	33.5	0.02	107.9	-	390
Carey Bay	1997	DBAC	5/16/97	-	1.6	10	2	12.11	10.1	7.1	33.6	0.02	106.7	-	392
Carey Bay	1997	DBAC	5/16/97	-	1.6	9	3.5	11.57	9.45	7.05	32.8	0.02	100.3	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	8	5	11.39	9.02	7.02	33.9	0.02	97.7	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	7	6.5	11.37	8.88	7.01	34.2	0.02	97.2	-	396
Carey Bay	1997	DBAC	5/16/97	-	1.6	6	8	11.34	8.69	7.01	34.6	0.02	96.6	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	5	9.5	11.36	8.33	7	34.4	0.02	95.8	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	4	11	11.32	8.07	6.99	34.8	0.02	95	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	3	12.5	11.24	7.83	6.98	34.8	0.02	93.7	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	2	14	10.99	7.61	6.96	35.2	0.02	91	-	396
Carey Bay	1997	DBAC	5/16/97	-	1.6	1	15.3	10.38	6.86	6.95	37.3	0.02	84.5	-	396
Carey Bay	2197	DBSS	5/29/97	-	1.4	14	0.3	10.67	14.15	6.97	28.5	0.02	103.3	-	366
Carey Bay	2197	DBSS	5/29/97	-	1.4	13	1	11.21	10.91	6.99	26.2	0.02	100.9	-	366
Carey Bay	2197	DBSS	5/29/97	-	1.4	12	2.1	10.88	10.38	6.97	26.3	0.02	96.7	-	367
Carey Bay	2197	DBSS	5/29/97	-	1.4	11	3.1	10.63	10.2	6.94	26.3	0.02	94.1	-	368
Carey Bay	2197	DBSS	5/29/97	-	1.4	10	4.1	10.64	9.86	6.91	26.2	0.02	93.3	-	369
Carey Bay	2197	DBSS	5/29/97	-	1.4	9	5.1	10.43	9.79	6.92	26.4	0.02	91.3	-	368
Carey Bay	2197	DBSS	5/29/97	-	1.4	8	6.2	10.43	9.74	6.93	26.5	0.02	91.3	-	368
Carey Bay	2197	DBSS	5/29/97	-	1.4	7	7.2	10.61	9.64	6.92	26.3	0.02	92.6	-	367
Carey Bay	2197	DBSS	5/29/97	-	1.4	6	8.2	10.61	9.53	6.94	26.4	0.02	92.4	-	366
Carey Bay	2197	DBSS	5/29/97	-	1.4	5	9.2	10.64	9.43	6.93	26.4	0.02	92.4	-	366

Carey Bay	2197	DBSS	5/29/97	-	1.4	4	10.2	10.64	9.3	6.93	26.5	0.02	92.1	-	366
Carey Bay	2197	DBSS	5/29/97	-	1.4	3	11.2	10.61	9.12	6.94	26.7	0.02	91.5	-	365
Carey Bay	2197	DBSS	5/29/97	-	1.4	2	12.3	10.56	8.86	6.93	27.5	0.02	90.3	-	365
Carey Bay	2197	DBSS	5/29/97	-	1.4	1	13.2	10.64	8.66	6.94	27.8	0.02	90.7	-	364
Carey Bay	2397	DBAS	6/11/97	-	2	14	0.7	10.87	15.48	7.17	31.2	0.02	108.7	-	411
Carey Bay	2397	DBAS	6/11/97	-	2	13	1.6	11.2	14.35	7.1	30.9	0.02	109.3	-	414
Carey Bay	2397	DBAS	6/11/97	-	2	12	2.5	11.22	11.79	7.09	29.1	0.02	103.4	-	415
Carey Bay	2397	DBAS	6/11/97	-	2	11	3.5	11.32	11.3	7.07	28.9	0.02	103.2	-	416
Carey Bay	2397	DBAS	6/11/97	-	2	10	4.5	11.27	11.22	7.06	28.8	0.02	102.5	-	417
Carey Bay	2397	DBAS	6/11/97	-	2	9	5.5	10.97	10.99	7.03	28.8	0.02	99.2	-	418
Carey Bay	2397	DBAS	6/11/97	-	2	8	6.5	10.9	10.38	7.01	28.8	0.02	97.2	-	419
Carey Bay	2397	DBAS	6/11/97	-	2	7	7.5	10.84	10.17	7.01	28.7	0.02	96.2	-	419
Carey Bay	2397	DBAS	6/11/97	-	2	6	8.5	10.69	9.91	6.98	28.9	0.02	94.2	-	420
Carey Bay	2397	DBAS	6/11/97	-	2	5	9.5	10.63	9.45	6.98	29.4	0.02	92.7	-	420
Carey Bay	2397	DBAS	6/11/97	-	2	4	10.5	10.61	9.22	6.97	30.2	0.02	92	-	421
Carey Bay	2397	DBAS	6/11/97	-	2	3	11.4	10.58	8.99	6.97	31.1	0.02	91.2	-	421
Carey Bay	2397	DBAS	6/11/97	-	2	2	12.5	10.56	8.84	6.96	31.9	0.02	90.6	-	421
Carey Bay	2397	DBAS	6/11/97	-	2	1	13.4	10.14	8.11	6.95	36.1	0.02	85.6	-	423
Carey Bay	2597	DBSS	6/26/97	-	2.5	12	0.3	10.81	14.98	7.2	30.4	0.02	106.8	-	427
Carey Bay	2597	DBSS	6/26/97	-	2.5	11	0.9	10.81	14.93	7.17	30.4	0.02	106.8	-	429
Carey Bay	2597	DBSS	6/26/97	-	2.5	10	1.8	10.85	14.49	7.11	30.2	0.02	106.1	-	432
Carey Bay	2597	DBSS	6/26/97	-	2.5	9	2.8	10.91	13.73	7.12	29.9	0.02	104.9	-	431
Carey Bay	2597	DBSS	6/26/97	-	2.5	8	3.8	10.94	13.11	7.1	29.8	0.02	103.8	-	432
Carey Bay	2597	DBSS	6/26/97	-	2.5	7	4.8	10.91	12.73	7.06	29.6	0.02	102.6	-	434
Carey Bay	2597	DBSS	6/26/97	-	2.5	6	5.7	10.84	12.33	6.99	29.8	0.02	101.1	-	436
Carey Bay	2597	DBSS	6/26/97	-	2.5	5	6.8	10.61	11.74	6.94	29.5	0.02	97.5	-	438
Carey Bay	2597	DBSS	6/26/97	-	2.5	4	7.7	10.42	10.66	6.92	29.3	0.02	93.4	-	440
Carey Bay	2597	DBSS	6/26/97	-	2.5	3	8.7	10.01	10.1	6.89	29.9	0.02	88.6	-	441
Carey Bay	2597	DBSS	6/26/97	-	2.5	2	9.7	9.88	9.97	6.91	30.4	0.02	87.1	-	440
Carey Bay	2597	DBSS	6/26/97	-	2.5	1	10.6	9.78	9.66	6.92	31.3	0.02	85.6	-	440

Carey Bay	2797	DBSS	7/8/97	-	2.9	13	0.3	10.09	18.7	7.18	36.8	0.02	*****	-	444
Carey Bay	2797	DBSS	7/8/97	-	2.9	12	1.1	10.09	18.66	7.17	36.9	0.02	*****	-	444
Carey Bay	2797	DBSS	7/8/97	-	2.9	11	1.9	10.24	17.47	7.13	36.3	0.02	*****	-	446
Carey Bay	2797	DBSS	7/8/97	-	2.9	10	2.9	10.39	16.41	7.09	37.1	0.02	*****	-	449
Carey Bay	2797	DBSS	7/8/97	-	2.9	9	3.9	10.25	16.19	7.04	37.4	0.02	*****	-	450
Carey Bay	2797	DBSS	7/8/97	-	2.9	8	5	10.47	15.01	7.01	36.9	0.02	*****	-	452
Carey Bay	2797	DBSS	7/8/97	-	2.9	7	5.9	10.37	14.42	6.97	35.9	0.02	*****	-	454
Carey Bay	2797	DBSS	7/8/97	-	2.9	6	7.1	10.16	13.17	6.94	34.3	0.02	96.2	-	455
Carey Bay	2797	DBSS	7/8/97	-	2.9	5	8	10	12.81	6.93	34.2	0.02	93.9	-	456
Carey Bay	2797	DBSS	7/8/97	-	2.9	4	9	9.91	12.15	6.91	33.4	0.02	91.7	-	457
Carey Bay	2797	DBSS	7/8/97	-	2.9	3	10	9.55	11.25	6.9	33	0.02	86.5	-	458
Carey Bay	2797	DBSS	7/8/97	-	2.9	2	11	9.03	9.98	6.91	34.7	0.02	79.4	-	460
Carey Bay	2797	DBSS	7/8/97	-	2.9	1	11.9	9.2	9.77	6.97	35.1	0.02	80.4	-	457
Carey Bay	2997	SSJD	7/24/97	-	5.5	14	0.3	9.94	20.53	7.53	40	0.03	*****	-	408
Carey Bay	2997	SSJD	7/24/97	-	5.5	13	0.8	9.99	20.55	7.51	40	0.03	*****	-	408
Carey Bay	2997	SSJD	7/24/97	-	5.5	12	1.8	10.43	19.63	7.5	39.7	0.03	*****	-	410
Carey Bay	2997	SSJD	7/24/97	-	5.5	11	2.8	10.53	18.87	7.48	38.4	0.02	*****	-	410
Carey Bay	2997	SSJD	7/24/97	-	5.5	10	3.7	10.45	18.25	7.34	38.9	0.02	*****	-	414
Carey Bay	2997	SSJD	7/24/97	-	5.5	9	4.8	10.36	17.29	7.24	37.6	0.02	*****	-	418
Carey Bay	2997	SSJD	7/24/97	-	5.5	8	5.8	10.3	16.48	7.19	36.7	0.02	*****	-	419
Carey Bay	2997	SSJD	7/24/97	-	5.5	7	6.7	10.29	16.07	7.16	36	0.02	*****	-	419
Carey Bay	2997	SSJD	7/24/97	-	5.5	6	7.9	9.77	15.61	7.07	35.2	0.02	97.7	-	422
Carey Bay	2997	SSJD	7/24/97	-	5.5	5	8.4	10.09	15.67	7.02	35.3	0.02	*****	-	422
Carey Bay	2997	SSJD	7/24/97	-	5.5	4	9.4	9.66	14.52	6.98	33.7	0.02	94.3	-	423
Carey Bay	2997	SSJD	7/24/97	-	5.5	3	10.4	9.48	13.88	6.94	33.3	0.02	91.2	-	424
Carey Bay	2997	SSJD	7/24/97	-	5.5	2	11.4	8.87	12.67	6.91	33.1	0.02	83	-	426
Carey Bay	2997	SSJD	7/24/97	-	5.5	1	12.4	7.87	10.18	6.93	36.1	0.02	69.6	-	427
Carey Bay	3197	DBSS	8/5/97	-	5.3	12	0.3	9.47	23.01	7.6	43.4	0.03	109	-	364
Carey Bay	3197	DBSS	8/5/97	-	5.3	11	1	9.51	22.72	7.59	43.5	0.03	108.8	-	365

Carey Bay	3197	DBSS	8/5/97	-	5.3	10	2.1	9.61	22.15	7.53	43.8	0.03	108.7	-	366
Carey Bay	3197	DBSS	8/5/97	-	5.3	9	3	9.66	21.88	7.5	42.6	0.03	108.8	-	367
Carey Bay	3197	DBSS	8/5/97	-	5.3	8	3.9	9.81	21.53	7.47	43.8	0.03	109.7	-	368
Carey Bay	3197	DBSS	8/5/97	-	5.3	7	4.9	9.89	21.11	7.42	43	0.03	109.5	-	369
Carey Bay	3197	DBSS	8/5/97	-	5.3	6	6	9.91	20.84	7.34	41.5	0.03	109.4	-	371
Carey Bay	3197	DBSS	8/5/97	-	5.3	5	6.9	9.66	19.4	7.27	39.5	0.03	103.6	-	374
Carey Bay	3197	DBSS	8/5/97	-	5.3	4	7.9	10.34	18.36	7.26	37.2	0.02	108.6	-	373
Carey Bay	3197	DBSS	8/5/97	-	5.3	3	9	9.68	17.1	7.14	36.6	0.02	99.1	-	377
Carey Bay	3197	DBSS	8/5/97	-	5.3	2	10	8.87	15.07	7.06	35.5	0.02	86.9	-	380
Carey Bay	3197	DBSS	8/5/97	-	5.3	1	11	7.89	14.19	7.1	35.6	0.02	75.9	-	381
Carey Bay	3297	DBSS	8/14/97	-	8	13	0.4	8.59	22.47	7.5	45.1	0.03	98.4	-	378
Carey Bay	3297	DBSS	8/14/97	-	8	12	1.4	8.6	22.43	7.54	45.1	0.03	98.5	-	376
Carey Bay	3297	DBSS	8/14/97	-	8	11	2.4	8.65	22.33	7.47	45.1	0.03	98.9	-	377
Carey Bay	3297	DBSS	8/14/97	-	8	10	3.3	8.67	22.22	7.42	45.3	0.03	98.8	-	378
Carey Bay	3297	DBSS	8/14/97	-	8	9	4.3	8.66	21.9	7.3	45.9	0.03	98.2	-	383
Carey Bay	3297	DBSS	8/14/97	-	8	8	5.3	8.61	21.55	7.25	45.7	0.03	97	-	385
Carey Bay	3297	DBSS	8/14/97	-	8	7	6.4	8.62	21.19	7.2	45.6	0.03	96.4	-	386
Carey Bay	3297	DBSS	8/14/97	-	8	6	7.4	8.39	20.53	7.15	43	0.03	92.6	-	388
Carey Bay	3297	DBSS	8/14/97	-	8	5	8.4	8.64	19.56	7.01	40.1	0.03	93.5	-	391
Carey Bay	3297	DBSS	8/14/97	-	8	4	9.4	8.27	18.94	6.95	39.7	0.03	88.4	-	393
Carey Bay	3297	DBSS	8/14/97	-	8	3	10.4	8.26	18.41	6.88	38.9	0.02	87.5	-	395
Carey Bay	3297	DBSS	8/14/97	-	8	2	11.5	7.89	15.96	6.83	36.5	0.02	79.3	-	398
Carey Bay	3297	DBSS	8/14/97	-	8	1	12.4	6.74	13.07	6.82	37.1	0.02	62.7	-	401
Carey Bay	3497	DBSS	8/27/97	-	8.2	14	0.3	8.97	21.76	7.5	49.7	0.03	101.6	-	356
Carey Bay	3497	DBSS	8/27/97	-	8.2	13	0.9	8.98	21.74	7.52	49.6	0.03	101.6	-	355
Carey Bay	3497	DBSS	8/27/97	-	8.2	12	1.9	8.99	21.67	7.5	49.6	0.03	101.6	-	356
Carey Bay	3497	DBSS	8/27/97	-	8.2	11	2.9	9	21.53	7.45	49.8	0.03	101.5	-	358
Carey Bay	3497	DBSS	8/27/97	-	8.2	10	3.9	8.93	21.37	7.43	49.3	0.03	100.4	-	358
Carey Bay	3497	DBSS	8/27/97	-	8.2	9	4.9	8.91	21.26	7.39	49.3	0.03	99.9	-	359
Carey Bay	3497	DBSS	8/27/97	-	8.2	8	6.1	8.89	21.09	7.36	49.3	0.03	99.4	-	360

Carey Bay	3497	DBSS	8/27/97	-	8.2	7	7	8.95	20.91	7.34	49.6	0.03	99.7	-	360
Carey Bay	3497	DBSS	8/27/97	-	8.2	6	8	8.92	20.84	7.28	49.5	0.03	99.2	-	362
Carey Bay	3497	DBSS	8/27/97	-	8.2	5	9	8.84	20.7	7.18	49.1	0.03	98.1	-	365
Carey Bay	3497	DBSS	8/27/97	-	8.2	4	10	8.6	20.42	7.08	48.3	0.03	95	-	370
Carey Bay	3497	DBSS	8/27/97	-	8.2	3	11	8.16	16.21	6.99	40.9	0.03	82.6	-	376
Carey Bay	3497	DBSS	8/27/97	-	8.2	2	11.9	8.02	15.24	7.04	40.2	0.03	79.5	-	374
Carey Bay	3497	DBSS	8/27/97	-	8.2	1	12.9	8.03	14.64	7.15	40.2	0.03	78.6	-	372
Carey Bay	3797	ASRP	9/17/97	-	3.5	13	0.5	8.05	14.69	6.76	44.3	0.03	80.1	-	408
Carey Bay	3797	ASRP	9/17/97	-	3.5	12	1.5	7.89	14.03	6.72	43.7	0.03	77.4	-	411
Carey Bay	3797	ASRP	9/17/97	-	3.5	11	2.5	7.64	11.22	6.71	42.5	0.03	70.3	-	413
Carey Bay	3797	ASRP	9/17/97	-	3.5	10	3.5	7.84	9.99	6.71	42.4	0.03	70.1	-	414
Carey Bay	3797	ASRP	9/17/97	-	3.5	9	4.6	8.21	9.33	6.7	42.9	0.03	72.1	-	415
Carey Bay	3797	ASRP	9/17/97	-	3.5	8	5.5	8.13	9.17	6.71	42.9	0.03	71.1	-	415
Carey Bay	3797	ASRP	9/17/97	-	3.5	7	6.5	8.2	9.1	6.72	43.1	0.03	71.8	-	415
Carey Bay	3797	ASRP	9/17/97	-	3.5	6	7.5	8.27	8.99	6.73	43.2	0.03	72.2	-	414
Carey Bay	3797	ASRP	9/17/97	-	3.5	5	8.5	8.31	8.89	6.75	43.3	0.03	72.3	-	414
Carey Bay	3797	ASRP	9/17/97	-	3.5	4	9.3	8.34	8.78	6.75	43.3	0.03	72.3	-	414
Carey Bay	3797	ASRP	9/17/97	-	3.5	3	10.7	8.67	8.6	6.77	43.5	0.03	75.2	-	413
Carey Bay	3797	ASRP	9/17/97	-	3.5	2	11.5	8.4	8.6	6.78	43.3	0.03	72.7	-	413
Carey Bay	3797	ASRP	9/17/97	-	3.5	1	12.5	8.46	8.48	6.82	43.4	0.03	73.3	-	412
Carey Bay	3997	ASRA	9/29/97	-	6.3	13	0.2	9.16	16.28	7.09	50	0.03	94.3	-	411
Carey Bay	3997	ASRA	9/29/97	-	6.3	12	1	9.09	15.89	7.08	49.9	0.03	92.9	-	411
Carey Bay	3997	ASRA	9/29/97	-	6.3	11	2	9.02	15.58	7.07	49.9	0.03	91.6	-	411
Carey Bay	3997	ASRA	9/29/97	-	6.3	10	3	8.95	15.44	7.04	50	0.03	90.6	-	412
Carey Bay	3997	ASRA	9/29/97	-	6.3	9	4	8.83	15.34	6.99	49.9	0.03	89.2	-	413
Carey Bay	3997	ASRA	9/29/97	-	6.3	8	5	8.59	15.11	6.92	49.4	0.03	86.3	-	415
Carey Bay	3997	ASRA	9/29/97	-	6.3	7	6	7.93	14.51	6.8	47.5	0.03	78.7	-	419
Carey Bay	3997	ASRA	9/29/97	-	6.3	6	7	7.68	12.41	6.77	44.2	0.03	72.7	-	421
Carey Bay	3997	ASRA	9/29/97	-	6.3	5	8	7.63	12.32	6.77	44.2	0.03	72.1	-	421
Carey Bay	3997	ASRA	9/29/97	-	6.3	4	9	7.56	12.14	6.77	43.9	0.03	71.1	-	420

Carey Bay	3997	ASRA	9/29/97	-	6.3	3	10	7.3	10.38	6.75	42.4	0.03	65.9	-	421
Carey Bay	3997	ASRA	9/29/97	-	6.3	2	11	7.79	8.86	6.84	42.2	0.03	67.8	-	419
Carey Bay	3997	ASRA	9/29/97	-	6.3	1	12	8.33	8.37	6.93	42.3	0.03	71.6	-	416
Carey Bay	4297	DBAS	10/22/97	-	4.5	10	0.3	10.25	11.54	7.25	49	0.03	93.6	-	401
Carey Bay	4297	DBAS	10/22/97	-	4.5	9	1.7	10.24	11.56	7.23	49.1	0.03	93.6	-	402
Carey Bay	4297	DBAS	10/22/97	-	4.5	8	2.7	10.24	11.54	7.24	49.2	0.03	93.5	-	401
Carey Bay	4297	DBAS	10/22/97	-	4.5	7	3.7	10.21	11.54	7.21	49.2	0.03	93.2	-	403
Carey Bay	4297	DBAS	10/22/97	-	4.5	6	4.7	10.18	11.54	7.23	49.1	0.03	93	-	402
Carey Bay	4297	DBAS	10/22/97	-	4.5	5	5.7	10.19	11.53	7.22	49.2	0.03	93	-	402
Carey Bay	4297	DBAS	10/22/97	-	4.5	4	6.7	10.19	11.53	7.22	49.3	0.03	93	-	402
Carey Bay	4297	DBAS	10/22/97	-	4.5	3	7.7	10.19	11.53	7.22	49.3	0.03	93	-	402
Carey Bay	4297	DBAS	10/22/97	-	4.5	2	8.7	10.1	11.53	7.21	49.3	0.03	92.2	-	403
Carey Bay	4297	DBAS	10/22/97	-	4.5	1	9.7	10.05	11.51	7.19	49.2	0.03	91.7	-	404
Carey Bay	4497	DBAS	11/4/97	-	3.8	13	0.4	10.06	9.87	7.07	53.3	0.03	88	56	389
Carey Bay	4497	DBAS	11/4/97	-	3.8	12	1.5	10.34	9.55	7.09	53.1	0.03	89.8	215	390
Carey Bay	4497	DBAS	11/4/97	-	3.8	11	2.5	10.46	9.5	7.12	52.9	0.03	90.7	54	390
Carey Bay	4497	DBAS	11/4/97	-	3.8	10	3.5	10.5	9.53	7.11	53	0.03	91.1	41	390
Carey Bay	4497	DBAS	11/4/97	-	3.8	9	4.5	10.5	9.45	7.12	52.9	0.03	90.9	56	389
Carey Bay	4497	DBAS	11/4/97	-	3.8	8	5.5	10.45	9.4	7.11	53	0.03	90.4	113	389
Carey Bay	4497	DBAS	11/4/97	-	3.8	7	6.5	10.28	9.33	7.06	53	0.03	88.8	103	390
Carey Bay	4497	DBAS	11/4/97	-	3.8	6	7.5	10.14	9.22	7.01	52.9	0.03	87.3	210	392
Carey Bay	4497	DBAS	11/4/97	-	3.8	5	8.5	9.65	8.89	6.93	53.1	0.03	82.5	101	393
Carey Bay	4497	DBAS	11/4/97	-	3.8	4	9.5	9.51	8.81	6.89	52.9	0.03	81.1	54	394
Carey Bay	4497	DBAS	11/4/97	-	3.8	3	10.6	9.08	8.58	6.86	52.4	0.03	77	37	395
Carey Bay	4497	DBAS	11/4/97	-	3.8	2	11.5	8.98	8.47	6.87	52.1	0.03	76	111	394

Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
Conkling Point	1597	ASSS	4/18/97	-	1.1	13	0.4	12.35	6.31	7.45	36.4	0.02	99.9	-	372
Conkling Point	1597	ASSS	4/18/97	-	1.1	12	1.9	12.27	6.23	7.43	36.4	0.02	99.2	-	373

Conkling Point	1597	ASSS	4/18/97	-	1.1	11	3.2	12.29	6.2	7.43	36.6	0.02	99.2	-	373
Conkling Point	1597	ASSS	4/18/97	-	1.1	10	4.5	12.27	6.13	7.43	36.7	0.02	98.7	-	373
Conkling Point	1597	ASSS	4/18/97	-	1.1	9	5.7	12.23	6.05	7.42	37	0.02	98.4	-	373
Conkling Point	1597	ASSS	4/18/97	-	1.1	8	7	12.26	5.97	7.41	37.4	0.02	98.4	-	374
Conkling Point	1597	ASSS	4/18/97	-	1.1	7	8.2	12.24	5.97	7.4	37.3	0.02	98.2	-	373
Conkling Point	1597	ASSS	4/18/97	-	1.1	6	9.4	12.26	5.9	7.4	37.6	0.02	98.2	-	373
Conkling Point	1597	ASSS	4/18/97	-	1.1	5	10.4	12.24	5.82	7.39	37.8	0.02	97.9	-	374
Conkling Point	1597	ASSS	4/18/97	-	1.1	4	11.8	12.21	5.62	7.38	38.2	0.02	97.1	-	374
Conkling Point	1597	ASSS	4/18/97	-	1.1	3	13.1	12.2	5.57	7.37	38.3	0.02	96.9	-	374
Conkling Point	1597	ASSS	4/18/97	-	1.1	2	14.4	12.14	5.51	7.36	38.2	0.02	96.3	-	374
Conkling Point	1597	ASSS	4/18/97	-	1.1	1	15.9	12.16	5.29	7.36	38.5	0.02	95.9	-	374
Conkling Point	1997	DBAC	5/16/97	-	0.8	12	0.2	10.99	11.35	6.99	28	0.02	99.6	-	367
Conkling Point	1997	DBAC	5/16/97	-	0.8	11	2.1	11.1	9.61	6.98	27.8	0.02	96.7	-	369
Conkling Point	1997	DBAC	5/16/97	-	0.8	10	3.9	11.09	9.46	7	27.8	0.02	96.2	-	368
Conkling Point	1997	DBAC	5/16/97	-	0.8	9	5.5	11.08	9.42	6.98	27.7	0.02	96	-	369
Conkling Point	1997	DBAC	5/16/97	-	0.8	8	7	11.05	9.35	6.97	27.9	0.02	95.6	-	369
Conkling Point	1997	DBAC	5/16/97	-	0.8	7	8.6	11.04	9.28	6.98	28.2	0.02	95.3	-	368
Conkling Point	1997	DBAC	5/16/97	-	0.8	6	10.1	11.03	9.28	6.97	28.2	0.02	95.3	-	368
Conkling Point	1997	DBAC	5/16/97	-	0.8	5	11.6	11.01	9.15	6.97	28.6	0.02	94.7	-	368
Conkling Point	1997	DBAC	5/16/97	-	0.8	4	13	11.03	8.35	6.95	31.4	0.02	93.1	-	369
Conkling Point	1997	DBAC	5/16/97	-	0.8	3	14.5	11.15	7.45	6.93	34.8	0.02	92.1	-	369
Conkling Point	1997	DBAC	5/16/97	-	0.8	2	16	10.71	6.08	6.89	41	0.03	85.6	-	372
Conkling Point	1997	DBAC	5/16/97	-	0.8	1	17.5	10.51	5.9	6.89	44.8	0.03	83.4	-	370
Conkling Point	2197	DBSS	5/29/97	-	1.8	12	0.2	11.09	11.41	7.01	26.9	0.02	101	-	362
Conkling Point	2197	DBSS	5/29/97	-	1.8	11	1.4	11.11	10.79	7.02	26.9	0.02	99.7	-	363
Conkling Point	2197	DBSS	5/29/97	-	1.8	10	2.9	11.16	10.36	7	26.8	0.02	99	-	364
Conkling Point	2197	DBSS	5/29/97	-	1.8	9	4.5	11.12	10.22	6.98	26.8	0.02	98.4	-	365
Conkling Point	2197	DBSS	5/29/97	-	1.8	8	6	11.12	10.05	6.96	26.9	0.02	98	-	365
Conkling Point	2197	DBSS	5/29/97	-	1.8	7	7.4	11.05	9.74	6.94	26.8	0.02	96.6	-	364
Conkling Point	2197	DBSS	5/29/97	-	1.8	6	8.9	11.01	9.61	6.93	26.9	0.02	96	-	364

Conkling Point	2197	DBSS	5/29/97	-	1.8	5	10.4	10.97	9.43	6.92	26.9	0.02	95.3	-	363
Conkling Point	2197	DBSS	5/29/97	-	1.8	4	12.1	10.89	8.96	6.91	27.2	0.02	93.5	-	362
Conkling Point	2197	DBSS	5/29/97	-	1.8	3	13.4	10.75	8.71	6.9	27.8	0.02	91.8	-	362
Conkling Point	2197	DBSS	5/29/97	-	1.8	2	15	10.75	7.97	6.88	31.3	0.02	90.1	-	361
Conkling Point	2197	DBSS	5/29/97	-	1.8	1	16.8	10.29	7.01	6.86	36	0.02	84.3	-	360
Conkling Point	2397	DBAS	6/11/97	-	2	12	0.2	10.9	15.61	7.09	30.8	0.02	109.4	-	395
Conkling Point	2397	DBAS	6/11/97	-	2	11	1	10.7	14.08	7.08	30.1	0.02	103.8	-	396
Conkling Point	2397	DBAS	6/11/97	-	2	10	2.5	10.95	12.4	7.06	29.4	0.02	102.2	-	398
Conkling Point	2397	DBAS	6/11/97	-	2	9	4	10.98	11.91	7.04	29.1	0.02	101.5	-	398
Conkling Point	2397	DBAS	6/11/97	-	2	8	5.3	10.87	11.77	6.99	29.2	0.02	100.1	-	399
Conkling Point	2397	DBAS	6/11/97	-	2	7	6.9	10.85	10.68	6.99	29.6	0.02	97.3	-	400
Conkling Point	2397	DBAS	6/11/97	-	2	6	8.3	10.82	9.94	6.98	29.1	0.02	95.5	-	399
Conkling Point	2397	DBAS	6/11/97	-	2	5	9.9	10.78	9.78	6.97	28.9	0.02	94.7	-	399
Conkling Point	2397	DBAS	6/11/97	-	2	4	11.4	10.73	9.33	6.96	29.8	0.02	93.3	-	398
Conkling Point	2397	DBAS	6/11/97	-	2	3	13	10.53	8.72	6.94	32.2	0.02	90.2	-	398
Conkling Point	2397	DBAS	6/11/97	-	2	2	14.5	10.48	8.47	6.93	33.3	0.02	89.3	-	398
Conkling Point	2397	DBAS	6/11/97	-	2	1	16.2	10.17	7.86	6.93	37.1	0.02	85.3	-	395
Conkling Point	2597	DBSS	6/26/97	-	2.5	16	0.4	10.79	15.18	7.23	30.6	0.02	107.1	-	421
Conkling Point	2597	DBSS	6/26/97	-	2.5	15	1	10.79	15.14	7.23	30.6	0.02	107.1	-	422
Conkling Point	2597	DBSS	6/26/97	-	2.5	14	2.2	10.8	14.94	7.21	30.7	0.02	106.7	-	424
Conkling Point	2597	DBSS	6/26/97	-	2.5	13	3.3	10.82	14.66	7.15	31	0.02	106.2	-	426
Conkling Point	2597	DBSS	6/26/97	-	2.5	12	4.2	10.75	14.46	7.11	30.9	0.02	105	-	427
Conkling Point	2597	DBSS	6/26/97	-	2.5	11	5.2	10.87	13.07	7.06	31.2	0.02	103	-	430
Conkling Point	2597	DBSS	6/26/97	-	2.5	10	6.2	10.75	12.66	7.02	30.8	0.02	101	-	431
Conkling Point	2597	DBSS	6/26/97	-	2.5	9	7.2	10.78	12.17	7	30.6	0.02	100.1	-	431
Conkling Point	2597	DBSS	6/26/97	-	2.5	8	8.2	10.73	12	6.95	30.8	0.02	99.3	-	431
Conkling Point	2597	DBSS	6/26/97	-	2.5	7	9.3	10.02	10.77	6.9	29.5	0.02	90	-	434
Conkling Point	2597	DBSS	6/26/97	-	2.5	6	10.2	10.21	9.2	6.83	31.2	0.02	88.4	-	435
Conkling Point	2597	DBSS	6/26/97	-	2.5	5	11.3	9.97	8.66	6.8	32.7	0.02	85.2	-	435
Conkling Point	2597	DBSS	6/26/97	-	2.5	4	12.4	9.36	8.27	6.78	35.8	0.02	79.3	-	436

Conkling Point	2597	DBSS	6/26/97	-	2.5	3	13.3	9.52	7.91	6.8	37.2	0.02	79.9	-	434
Conkling Point	2597	DBSS	6/26/97	-	2.5	2	14.4	9.05	7.56	6.8	38.9	0.02	75.3	-	434
Conkling Point	2597	DBSS	6/26/97	-	2.5	1	15.3	8.74	7.43	6.82	40.2	0.03	72.5	-	433
Conkling Point	2797	DBSS	7/8/97	-	2.8	16	0.3	10.17	18.54	7.16	36.5	0.02	*****	-	434
Conkling Point	2797	DBSS	7/8/97	-	2.8	15	1.1	10.15	18	7.13	35.6	0.02	*****	-	436
Conkling Point	2797	DBSS	7/8/97	-	2.8	14	2	10.31	17.25	7.11	36.3	0.02	*****	-	437
Conkling Point	2797	DBSS	7/8/97	-	2.8	13	3	10.36	16.56	7.09	36.9	0.02	*****	-	438
Conkling Point	2797	DBSS	7/8/97	-	2.8	12	3.9	10.45	16.12	7.06	36.7	0.02	*****	-	439
Conkling Point	2797	DBSS	7/8/97	-	2.8	11	5	10.41	15.54	7.02	36.3	0.02	*****	-	440
Conkling Point	2797	DBSS	7/8/97	-	2.8	10	6	10.41	14.52	7	35.3	0.02	*****	-	441
Conkling Point	2797	DBSS	7/8/97	-	2.8	9	7.1	10.1	13.28	6.92	33.6	0.02	95.9	-	444
Conkling Point	2797	DBSS	7/8/97	-	2.8	8	8	10.03	12.71	6.89	33.8	0.02	93.9	-	445
Conkling Point	2797	DBSS	7/8/97	-	2.8	7	9	9.76	12.11	6.87	33.3	0.02	90.2	-	446
Conkling Point	2797	DBSS	7/8/97	-	2.8	6	10	9.26	11.34	6.84	33.2	0.02	84	-	447
Conkling Point	2797	DBSS	7/8/97	-	2.8	5	11	8.94	10.69	6.84	33.3	0.02	79.9	-	447
Conkling Point	2797	DBSS	7/8/97	-	2.8	4	11.9	8.68	9.59	6.84	35	0.02	75.5	-	448
Conkling Point	2797	DBSS	7/8/97	-	2.8	3	12.8	8.73	8.72	6.86	36.7	0.02	74.5	-	447
Conkling Point	2797	DBSS	7/8/97	-	2.8	2	13.9	8.74	8.45	6.88	37.7	0.02	73.9	-	448
Conkling Point	2797	DBSS	7/8/97	-	2.8	1	14.9	8.73	8.22	6.92	38.6	0.02	73.6	-	446
Conkling Point	2997	SSJD	7/24/97	-	4.5	10	0.4	9.56	21.37	7.46	39.7	0.03	*****	-	408
Conkling Point	2997	SSJD	7/24/97	-	4.5	9	2	9.59	20.79	7.37	37.6	0.02	*****	-	411
Conkling Point	2997	SSJD	7/24/97	-	4.5	8	3.5	10.4	18.18	7.26	38.4	0.02	*****	-	417
Conkling Point	2997	SSJD	7/24/97	-	4.5	7	5	10.43	17.3	7.13	38	0.02	*****	-	420
Conkling Point	2997	SSJD	7/24/97	-	4.5	6	6.5	10	16.31	7.05	35.9	0.02	*****	-	422
Conkling Point	2997	SSJD	7/24/97	-	4.5	5	8	10.02	15.41	6.93	34.8	0.02	99.8	-	427
Conkling Point	2997	SSJD	7/24/97	-	4.5	4	9.5	9.46	12.97	6.83	32.6	0.02	89.2	-	431
Conkling Point	2997	SSJD	7/24/97	-	4.5	3	11	9.31	12.3	6.77	32	0.02	86.4	-	433
Conkling Point	2997	SSJD	7/24/97	-	4.5	2	12.5	8.63	9.87	6.74	33.2	0.02	75.8	-	435
Conkling Point	2997	SSJD	7/24/97	-	4.5	1	14	8.17	8.72	6.74	36.4	0.02	69.7	-	435

Conkling Point	3197	DBSS	8/5/97	-	4.1	15	0.3	9.57	24	8.18	41.5	0.03	112.2	-	329
Conkling Point	3197	DBSS	8/5/97	-	4.1	14	1.8	9.56	22.25	7.5	43.2	0.03	108.4	-	350
Conkling Point	3197	DBSS	8/5/97	-	4.1	13	2.7	9.49	22.04	7.46	42.3	0.03	107.2	-	350
Conkling Point	3197	DBSS	8/5/97	-	4.1	12	3.6	9.48	21.7	7.39	41.4	0.03	106.4	-	352
Conkling Point	3197	DBSS	8/5/97	-	4.1	11	4.7	9.88	21.04	7.33	43.5	0.03	109.5	-	352
Conkling Point	3197	DBSS	8/5/97	-	4.1	10	5.6	9.4	20.23	7.19	40.7	0.03	102.5	-	356
Conkling Point	3197	DBSS	8/5/97	-	4.1	9	6.7	9.32	19.21	7.13	39.5	0.03	99.6	-	356
Conkling Point	3197	DBSS	8/5/97	-	4.1	8	7.7	9.69	18.15	7.13	37.4	0.02	101.4	-	354
Conkling Point	3197	DBSS	8/5/97	-	4.1	7	8.7	10.04	17.18	7.09	36.3	0.02	103	-	353
Conkling Point	3197	DBSS	8/5/97	-	4.1	6	9.7	9.28	15.82	6.99	35.4	0.02	92.4	-	354
Conkling Point	3197	DBSS	8/5/97	-	4.1	5	10.7	8.73	14.39	6.93	34.7	0.02	84.3	-	354
Conkling Point	3197	DBSS	8/5/97	-	4.1	4	11.8	8.22	12.28	6.91	33.7	0.02	75.9	-	350
Conkling Point	3197	DBSS	8/5/97	-	4.1	3	12.6	8.21	11.23	6.93	34.5	0.02	73.8	-	346
Conkling Point	3197	DBSS	8/5/97	-	4.1	2	13.7	8	10.16	6.95	35.9	0.02	70.2	-	342
Conkling Point	3197	DBSS	8/5/97	-	4.1	1	14.8	7.22	9.44	7.02	38.4	0.02	62.2	-	388
Conkling Point	3297	DBSS	8/14/97	-	5	11	0.3	8.64	22.75	7.98	44.7	0.03	99.5	-	368
Conkling Point	3297	DBSS	8/14/97	-	5	10	2.1	8.73	22.56	8.11	44.7	0.03	100.3	-	361
Conkling Point	3297	DBSS	8/14/97	-	5	9	3.6	8.81	22.33	7.87	44.3	0.03	100.7	-	363
Conkling Point	3297	DBSS	8/14/97	-	5	8	5	8.57	21.86	7.31	45.2	0.03	97.1	-	384
Conkling Point	3297	DBSS	8/14/97	-	5	7	6.5	8.56	21.26	7.14	46.4	0.03	95.9	-	389
Conkling Point	3297	DBSS	8/14/97	-	5	6	8	8.56	20.65	7.06	43.6	0.03	94.7	-	391
Conkling Point	3297	DBSS	8/14/97	-	5	5	9.6	8.58	18.75	6.94	39	0.03	91.4	-	396
Conkling Point	3297	DBSS	8/14/97	-	5	4	11	7.69	15.02	6.9	35.7	0.02	75.8	-	399
Conkling Point	3297	DBSS	8/14/97	-	5	3	12.6	6.19	15.07	6.87	36.5	0.02	77	-	399
Conkling Point	3297	DBSS	8/14/97	-	5	2	14	6.57	9.2	6.95	39.1	0.03	56.7	-	401
Conkling Point	3297	DBSS	8/14/97	-	5	1	15.6	6.79	8.9	7.08	39.3	0.03	58.2	-	398
Conkling Point	3497	DBSS	8/27/97	-	7.2	11	0.4	9.02	21.92	7.53	50	0.03	102.3	-	346
Conkling Point	3497	DBSS	8/27/97	-	7.2	10	2	9.03	21.7	7.51	50	0.03	102.1	-	346
Conkling Point	3497	DBSS	8/27/97	-	7.2	9	3.6	9	21.56	7.45	50	0.03	101.6	-	347
Conkling Point	3497	DBSS	8/27/97	-	7.2	8	5	9.01	21.44	7.4	50.3	0.03	101.4	-	349

Conkling Point	3497	DBSS	8/27/97	-	7.2	7	6.6	8.84	21.14	7.33	49.2	0.03	98.9	-	350
Conkling Point	3497	DBSS	8/27/97	-	7.2	6	8	8.73	21	7.17	49.5	0.03	97.4	-	355
Conkling Point	3497	DBSS	8/27/97	-	7.2	5	9.5	8.19	20.49	6.96	49.5	0.03	90.5	-	363
Conkling Point	3497	DBSS	8/27/97	-	7.2	4	11	7.84	17.3	6.89	42.7	0.03	81.2	-	368
Conkling Point	3497	DBSS	8/27/97	-	7.2	3	12.6	8.37	15.61	6.88	40.2	0.03	83.6	-	368
Conkling Point	3497	DBSS	8/27/97	-	7.2	2	14.1	7.65	12.49	6.86	39.9	0.03	71.3	-	369
Conkling Point	3497	DBSS	8/27/97	-	7.2	1	15.8	6.43	9.48	6.87	42.8	0.03	56	-	369
Conkling Point	3797	ASRP	9/17/97	-	3	16	0.2	8.46	14.83	6.87	47.6	0.03	84.4	-	392
Conkling Point	3797	ASRP	9/17/97	-	3	15	1	8.42	14.86	6.86	47.6	0.03	84.1	-	392
Conkling Point	3797	ASRP	9/17/97	-	3	14	2	8.3	14.58	6.79	46.9	0.03	82.4	-	395
Conkling Point	3797	ASRP	9/17/97	-	3	13	3	7.76	13.75	6.68	45.7	0.03	76.9	-	399
Conkling Point	3797	ASRP	9/17/97	-	3	12	4	7.6	10.69	6.62	42.6	0.03	69.1	-	404
Conkling Point	3797	ASRP	9/17/97	-	3	11	5	7.76	9.81	6.62	42.7	0.03	69.1	-	404
Conkling Point	3797	ASRP	9/17/97	-	3	10	6	7.91	9.5	6.63	42.7	0.03	69.9	-	403
Conkling Point	3797	ASRP	9/17/97	-	3	9	7	7.78	9.43	6.63	43.1	0.03	68.6	-	402
Conkling Point	3797	ASRP	9/17/97	-	3	8	8	7.61	9.37	6.63	42.9	0.03	67.2	-	402
Conkling Point	3797	ASRP	9/17/97	-	3	7	9	7.5	9.06	6.62	43	0.03	65.7	-	401
Conkling Point	3797	ASRP	9/17/97	-	3	6	10	7.18	8.74	6.63	43.3	0.03	62.5	-	400
Conkling Point	3797	ASRP	9/17/97	-	3	5	11	7.35	8.68	6.66	43.4	0.03	63.7	-	398
Conkling Point	3797	ASRP	9/17/97	-	3	4	12	8.42	8.29	6.71	43.8	0.03	72.1	-	395
Conkling Point	3797	ASRP	9/17/97	-	3	3	13	8.59	8.2	6.74	43.8	0.03	74.2	-	392
Conkling Point	3797	ASRP	9/17/97	-	3	2	14.1	8.63	8.19	6.76	43.8	0.03	73.9	-	391
Conkling Point	3797	ASRP	9/17/97	-	3	1	15.2	8.7	8.19	6.79	43.8	0.03	74.5	-	389
Conkling Point	3997	ASRA	9/29/97	-	6.2	10	0.2	9.53	16.26	7.21	50.8	0.03	98.2	-	388
Conkling Point	3997	ASRA	9/29/97	-	6.2	9	1.5	9.3	15.79	7.13	50.3	0.03	94.8	-	391
Conkling Point	3997	ASRA	9/29/97	-	6.2	8	3	9.24	15.61	7.06	50.2	0.03	93.9	-	392
Conkling Point	3997	ASRA	9/29/97	-	6.2	7	4.5	8.78	14.69	6.94	48.9	0.03	87.4	-	395
Conkling Point	3997	ASRA	9/29/97	-	6.2	6	6	8.32	13.67	6.83	47.1	0.03	81	-	397
Conkling Point	3997	ASRA	9/29/97	-	6.2	5	7.5	7.78	12.38	6.77	44.3	0.03	73.6	-	399
Conkling Point	3997	ASRA	9/29/97	-	6.2	4	9	7.84	10.9	6.76	44	0.03	71.7	-	398

Conkling Point	3997	ASRA	9/29/97	-	6.2	3	10.5	7.38	9.64	6.77	42.2	0.03	65.1	-	397
Conkling Point	3997	ASRA	9/29/97	-	6.2	2	12	7.86	8.4	6.82	42.3	0.03	67.6	-	395
Conkling Point	3997	ASRA	9/29/97	-	6.2	1	13.4	8.18	8.22	6.92	42.4	0.03	70.1	-	389
Conkling Point	4297	DBAS	10/22/97	-	4.1	16	0.2	10.3	11.54	7.28	48	0.03	94	-	378
Conkling Point	4297	DBAS	10/22/97	-	4.1	15	1	10.28	11.56	7.31	49	0.03	93.9	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	14	2	10.27	11.57	7.29	49.1	0.03	93.8	-	377
Conkling Point	4297	DBAS	10/22/97	-	4.1	13	3	10.26	11.54	7.31	49.2	0.03	93.7	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	12	4	10.28	11.54	7.29	49.3	0.03	93.8	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	11	5	10.25	11.54	7.29	49.1	0.03	93.6	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	10	6	10.28	11.54	7.29	49.2	0.03	93.8	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	9	7	10.26	11.54	7.28	49.3	0.03	93.7	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	8	8	10.25	11.54	7.29	49.3	0.03	93.6	-	375
Conkling Point	4297	DBAS	10/22/97	-	4.1	7	9	10.23	11.53	7.27	49.1	0.03	93.4	-	375
Conkling Point	4297	DBAS	10/22/97	-	4.1	6	10	10.24	11.53	7.27	49.1	0.03	93.5	-	375
Conkling Point	4297	DBAS	10/22/97	-	4.1	5	11	10.25	11.51	7.31	49.3	0.03	93.5	-	372
Conkling Point	4297	DBAS	10/22/97	-	4.1	4	12	10.26	11.5	7.3	49.3	0.03	93.4	-	372
Conkling Point	4297	DBAS	10/22/97	-	4.1	3	13	10.25	11.43	7.3	49.3	0.03	93.4	-	372
Conkling Point	4297	DBAS	10/22/97	-	4.1	2	14	10.63	11.15	7.31	49.5	0.03	96.2	-	371
Conkling Point	4297	DBAS	10/22/97	-	4.1	1	14.9	10.61	10.86	7.32	50	0.03	95.3	-	370
Conkling Point	4497	DBAS	11/3/97	-	3.1	11	0.3	10.59	7.04	9.79	53	0.03	93.2	*****	441
Conkling Point	4497	DBAS	11/3/97	-	3.1	10	1.5	10.54	7.05	9.74	53	0.03	92.5	*****	441
Conkling Point	4497	DBAS	11/3/97	-	3.1	9	3	10.52	7.02	9.6	53.1	0.03	92	*****	442
Conkling Point	4497	DBAS	11/3/97	-	3.1	8	4.5	10.75	6.99	9.24	52.9	0.03	93.3	*****	441
Conkling Point	4497	DBAS	11/3/97	-	3.1	7	6	10.97	6.93	8.74	53.7	0.03	94	*****	440
Conkling Point	4497	DBAS	11/3/97	-	3.1	6	7.5	9.25	6.79	8.48	52.9	0.03	78.8	*****	442
Conkling Point	4497	DBAS	11/3/97	-	3.1	5	9	9.27	6.77	8.48	52.8	0.03	78.9	*****	441
Conkling Point	4497	DBAS	11/3/97	-	3.1	4	10.5	9.32	6.75	8.43	52.5	0.03	79.3	*****	439
Conkling Point	4497	DBAS	11/3/97	-	3.1	3	12	8.81	6.66	7.73	48.8	0.03	73.7	*****	441
Conkling Point	4497	DBAS	11/3/97	-	3.1	2	13.6	8.64	6.66	7.41	47	0.03	71.6	*****	439
Conkling Point	4497	DBAS	11/3/97	-	3.1	1	14.9	8.65	6.71	7.37	46.7	0.03	71.7	*****	441

Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
Hidden Lake	1597	ASSS	4/18/97	-	1.9	5	0.2	12.49	6.73	7.46	38.6	0.02	*****	-	374
Hidden Lake	1597	ASSS	4/18/97	-	1.9	4	2.3	12.51	6.31	7.45	38.4	0.02	*****	-	375
Hidden Lake	1597	ASSS	4/18/97	-	1.9	3	3.7	12.54	6.28	7.45	38.4	0.02	*****	-	375
Hidden Lake	1597	ASSS	4/18/97	-	1.9	2	5.3	12.47	6.26	7.43	38.5	0.02	*****	-	375
Hidden Lake	1597	ASSS	4/18/97	-	1.9	1	6.9	12.38	6.23	7.42	38.3	0.02	99.9	-	375
Hidden Lake	1997	DBAC	5/16/97	-	0.7	11	0.2	11.1	11.97	7	29.9	0.02	102.2	-	371
Hidden Lake	1997	DBAC	5/16/97	-	0.7	10	1.4	11	10.64	6.97	28.7	0.02	98.1	-	376
Hidden Lake	1997	DBAC	5/16/97	-	0.7	9	2.4	11.06	9.38	6.97	28.8	0.02	95.8	-	377
Hidden Lake	1997	DBAC	5/16/97	-	0.7	8	3.4	11.03	9.3	6.97	29	0.02	95.3	-	377
Hidden Lake	1997	DBAC	5/16/97	-	0.7	7	4.5	11.03	9.27	6.96	29.3	0.02	95.3	-	377
Hidden Lake	1997	DBAC	5/16/97	-	0.7	6	5.4	11.01	9.25	6.98	29.4	0.02	95	-	375
Hidden Lake	1997	DBAC	5/16/97	-	0.7	5	6.4	10.95	9.17	6.96	30.2	0.02	94.4	-	376
Hidden Lake	1997	DBAC	5/16/97	-	0.7	4	7.5	10.89	9.1	6.98	29.1	0.02	93.6	-	375
Hidden Lake	1997	DBAC	5/16/97	-	0.7	3	8.5	10.87	9.07	6.98	28.8	0.02	93.4	-	374
Hidden Lake	1997	DBAC	5/16/97	-	0.7	2	9.3	10.86	9.04	6.99	28.9	0.02	93.3	-	373
Hidden Lake	1997	DBAC	5/16/97	-	0.7	1	10.4	10.86	8.97	6.99	30	0.02	93.1	-	373
Hidden Lake	2197	DBSS	5/29/97	-	1.7	10	0.7	10.91	12.61	6.99	26.6	0.02	101.9	-	361
Hidden Lake	2197	DBSS	5/29/97	-	1.7	9	1.8	11.25	9.84	7	26.9	0.02	98.6	-	361
Hidden Lake	2197	DBSS	5/29/97	-	1.7	8	2.8	11.18	9.53	6.99	26.7	0.02	97.3	-	361
Hidden Lake	2197	DBSS	5/29/97	-	1.7	7	3.7	11.14	9.3	6.97	26.6	0.02	96.5	-	362
Hidden Lake	2197	DBSS	5/29/97	-	1.7	6	4.7	11.13	9.19	6.95	26.6	0.02	96.1	-	362
Hidden Lake	2197	DBSS	5/29/97	-	1.7	5	5.7	11.03	9.12	6.95	26.4	0.02	95.3	-	361
Hidden Lake	2197	DBSS	5/29/97	-	1.7	4	6.8	10.74	8.45	6.92	26.4	0.02	91.1	-	361
Hidden Lake	2197	DBSS	5/29/97	-	1.7	3	7.7	10.76	8.38	6.92	26.3	0.02	91.1	-	360
Hidden Lake	2197	DBSS	5/29/97	-	1.7	2	8.8	10.62	8.33	6.91	26.5	0.02	89.8	-	359
Hidden Lake	2197	DBSS	5/29/97	-	1.7	1	9.8	10	8.3	6.91	27	0.02	84.5	-	367

Hidden Lake	2397	DBAS	6/11/97	-	2	10	0.5	11.03	13.17	7.09	29.3	0.02	104.9	-	405
Hidden Lake	2397	DBAS	6/11/97	-	2	9	1.6	11.24	12.28	7.11	29.1	0.02	104.7	-	405
Hidden Lake	2397	DBAS	6/11/97	-	2	8	2.6	11.15	11.98	7.1	29	0.02	103.2	-	405
Hidden Lake	2397	DBAS	6/11/97	-	2	7	3.6	11.13	11.91	7.06	29	0.02	102.9	-	407
Hidden Lake	2397	DBAS	6/11/97	-	2	6	4.3	11.1	10.59	7.02	28.5	0.02	99.5	-	409
Hidden Lake	2397	DBAS	6/11/97	-	2	5	5.3	10.97	10.02	7.01	28.2	0.02	97.1	-	410
Hidden Lake	2397	DBAS	6/11/97	-	2	4	6.3	10.96	9.61	6.99	27.7	0.02	96	-	410
Hidden Lake	2397	DBAS	6/11/97	-	2	3	7.2	10.72	9.35	6.98	27.7	0.02	93.3	-	411
Hidden Lake	2397	DBAS	6/11/97	-	2	2	8.1	10.16	9.13	6.98	28.1	0.02	88	-	411
Hidden Lake	2397	DBAS	6/11/97	-	2	1	8.2	10.15	9.12	6.98	28.1	0.02	87.8	-	411
Hidden Lake	2597	DBSS	6/26/97	-	2.4	11	0.4	10.75	13.72	7.16	30.6	0.02	103.3	-	406
Hidden Lake	2597	DBSS	6/26/97	-	2.4	10	0.3	10.75	13.77	7.15	30.6	0.02	103.5	-	406
Hidden Lake	2597	DBSS	6/26/97	-	2.4	9	1.2	10.78	13.3	7.14	30.4	0.02	102.7	-	409
Hidden Lake	2597	DBSS	6/26/97	-	2.4	8	2.4	10.8	12.94	7.13	30.5	0.02	102	-	409
Hidden Lake	2597	DBSS	6/26/97	-	2.4	7	3.4	10.75	12.74	7.11	30.2	0.02	101	-	410
Hidden Lake	2597	DBSS	6/26/97	-	2.4	6	4.5	10.52	12.44	7.06	30.3	0.02	98.3	-	411
Hidden Lake	2597	DBSS	6/26/97	-	2.4	5	4.5	10.54	12.36	7.02	30.3	0.02	98.3	-	411
Hidden Lake	2597	DBSS	6/26/97	-	2.4	4	5.5	10.38	11.89	6.98	30	0.02	95.8	-	411
Hidden Lake	2597	DBSS	6/26/97	-	2.4	3	6.5	7.98	11.15	6.83	29.8	0.02	72.3	-	416
Hidden Lake	2597	DBSS	6/26/97	-	2.4	2	7.5	6.41	10.43	6.86	30.3	0.02	57.2	-	418
Hidden Lake	2597	DBSS	6/26/97	-	2.4	1	7.4	6.45	10.38	6.88	30.3	0.02	57.4	-	419
Hidden Lake	2797	DBSS	7/8/97	-	2.4	12	0.3	10.08	18.56	7.14	34.7	0.02	*****	-	392
Hidden Lake	2797	DBSS	7/8/97	-	2.4	11	1.4	10.29	16.49	7.1	34.2	0.02	*****	-	395
Hidden Lake	2797	DBSS	7/8/97	-	2.4	10	2.1	10.45	16.29	7.08	34.2	0.02	*****	-	393
Hidden Lake	2797	DBSS	7/8/97	-	2.4	9	2.7	10.27	15.84	7.02	34.1	0.02	*****	-	394
Hidden Lake	2797	DBSS	7/8/97	-	2.4	8	3.4	10.49	15.25	6.98	33.8	0.02	*****	-	394
Hidden Lake	2797	DBSS	7/8/97	-	2.4	7	4.1	10.27	14.49	6.89	33.2	0.02	*****	-	396
Hidden Lake	2797	DBSS	7/8/97	-	2.4	6	4.8	9.94	13.4	6.84	32.4	0.02	94.5	-	396
Hidden Lake	2797	DBSS	7/8/97	-	2.4	5	5.4	9.42	13.18	6.77	32.6	0.02	89.2	-	396

Hidden Lake	2797	DBSS	7/8/97	-	2.4	4	6.1	8.57	12.67	6.72	32.4	0.02	80.2	-	395
Hidden Lake	2797	DBSS	7/8/97	-	2.4	3	6.9	7.84	12.2	6.7	32.5	0.02	72.4	-	392
Hidden Lake	2797	DBSS	7/8/97	-	2.4	2	7.6	6.94	11.93	6.7	32.6	0.02	63.7	-	388
Hidden Lake	2797	DBSS	7/8/97	-	2.4	1	8.3	6.46	11.82	6.82	32.8	0.02	59.3	-	375
Hidden Lake	2997	SSJD	7/24/97	-	3.5	10	0.5	9.66	22.27	7.88	35.2	0.02	*****	-	391
Hidden Lake	2997	SSJD	7/24/97	-	3.5	9	1	9.74	22.11	7.9	35.3	0.02	*****	-	390
Hidden Lake	2997	SSJD	7/24/97	-	3.5	8	1.5	9.8	21.99	7.82	35.2	0.02	*****	-	391
Hidden Lake	2997	SSJD	7/24/97	-	3.5	7	2.5	9.96	21.67	7.59	35.5	0.02	*****	-	395
Hidden Lake	2997	SSJD	7/24/97	-	3.5	6	3.5	10.45	17.59	7.02	32.7	0.02	*****	-	417
Hidden Lake	2997	SSJD	7/24/97	-	3.5	5	4.5	10	16.07	6.88	32	0.02	*****	-	421
Hidden Lake	2997	SSJD	7/24/97	-	3.5	4	5.4	8.64	14.36	6.67	31.6	0.02	84	-	425
Hidden Lake	2997	SSJD	7/24/97	-	3.5	3	6.5	6.29	13.18	6.61	33.2	0.02	59.8	-	427
Hidden Lake	2997	SSJD	7/24/97	-	3.5	2	7.3	5.5	12.9	6.65	33.7	0.02	51.8	-	424
Hidden Lake	2997	SSJD	7/24/97	-	3.5	1	8	4.83	12.77	6.82	34	0.02	45.4	-	432
Hidden Lake	3197	DBSS	8/5/97	-	5.1	10	0.3	10.19	25.4	8.67	38.8	0.02	122.5	-	256
Hidden Lake	3197	DBSS	8/5/97	-	5.1	9	1.5	10	24.66	8.44	38.2	0.02	118.5	-	258
Hidden Lake	3197	DBSS	8/5/97	-	5.1	8	2.5	10	24.16	8.19	38.2	0.02	117.4	-	258
Hidden Lake	3197	DBSS	8/5/97	-	5.1	7	3.5	10.08	21.44	7.21	35.1	0.02	112.5	-	289
Hidden Lake	3197	DBSS	8/5/97	-	5.1	6	4.5	10.33	18.29	7.05	32.4	0.02	108.5	-	293
Hidden Lake	3197	DBSS	8/5/97	-	5.1	5	5.5	8.93	16.04	6.89	32.7	0.02	89.4	-	284
Hidden Lake	3197	DBSS	8/5/97	-	5.1	4	6.6	5.91	14.49	6.83	36.5	0.02	57.1	-	269
Hidden Lake	3197	DBSS	8/5/97	-	5.1	3	7.5	2.2	13.35	6.85	40.1	0.03	20.7	-	237
Hidden Lake	3197	DBSS	8/5/97	-	5.1	2	8.5	0.44	12.85	7.02	52.9	0.03	4.1	-	178
Hidden Lake	3197	DBSS	8/5/97	-	5.1	1	8.5	0.48	12.82	7.09	52.2	0.03	4.5	-	174
Hidden Lake	3297	DBSS	8/14/97	-	6	10	0.3	8.76	23.28	7.95	39.9	0.03	101.9	-	275
Hidden Lake	3297	DBSS	8/14/97	-	6	9	1	8.77	23.22	7.89	39.8	0.03	101.9	-	271
Hidden Lake	3297	DBSS	8/14/97	-	6	8	2	8.82	22.95	7.8	39.9	0.03	102.1	-	269
Hidden Lake	3297	DBSS	8/14/97	-	6	7	3	8.91	22.74	7.54	40.3	0.03	102.6	-	271
Hidden Lake	3297	DBSS	8/14/97	-	6	6	4	8.64	21.72	6.98	38.8	0.02	97.6	-	290

Hidden Lake	3297	DBSS	8/14/97	-	6	5	5	8.67	18.32	6.76	34.5	0.02	91.6	-	296
Hidden Lake	3297	DBSS	8/14/97	-	6	4	6	6.25	16.11	6.67	37.6	0.02	63	-	288
Hidden Lake	3297	DBSS	8/14/97	-	6	3	6.9	2.37	14.47	6.6	41.7	0.03	22.7	-	266
Hidden Lake	3297	DBSS	8/14/97	-	6	2	8	0.46	13.43	6.59	50.7	0.03	4.4	-	242
Hidden Lake	3297	DBSS	8/14/97	-	6	1	8	0.81	13.86	6.92	47.1	0.03	8.1	-	225
Hidden Lake	3497	DBSS	8/27/97	-	5.7	10	0.5	9.39	22.02	7.9	44.9	0.03	106.8	-	235
Hidden Lake	3497	DBSS	8/27/97	-	5.7	9	0.3	9.39	22.02	7.9	44.9	0.03	106.8	-	235
Hidden Lake	3497	DBSS	8/27/97	-	5.7	8	1.6	9.41	21.92	7.88	45	0.03	106.9	-	231
Hidden Lake	3497	DBSS	8/27/97	-	5.7	7	2.4	9.43	21.88	7.83	45	0.03	107	-	223
Hidden Lake	3497	DBSS	8/27/97	-	5.7	6	3.5	9.45	21.85	7.74	45.1	0.03	107.2	-	219
Hidden Lake	3497	DBSS	8/27/97	-	5.7	5	4.6	9.33	21.58	7.44	44.9	0.03	105.3	-	218
Hidden Lake	3497	DBSS	8/27/97	-	5.7	4	5.4	10.33	19.92	7.05	42.8	0.03	112.9	-	228
Hidden Lake	3497	DBSS	8/27/97	-	5.7	3	6.5	3.7	17.44	6.73	47.1	0.03	38.4	-	208
Hidden Lake	3497	DBSS	8/27/97	-	5.7	2	7.5	0.3	14.92	6.67	57.7	0.04	2.9	-	147
Hidden Lake	3497	DBSS	8/27/97	-	5.7	1	8.4	0.4	13.88	6.6	79.9	0.05	3.9	-	139
Hidden Lake	3797	DBAS	9/16/97	-	2.5	9	0.2	8.74	18.01	7.31	47.1	0.03	92.1	-	296
Hidden Lake	3797	DBAS	9/16/97	-	2.5	8	1.2	8.75	18	7.3	47.2	0.03	92.3	-	295
Hidden Lake	3797	DBAS	9/16/97	-	2.5	7	2.2	8.68	17.9	7.27	47.1	0.03	91.3	-	294
Hidden Lake	3797	DBAS	9/16/97	-	2.5	6	3.2	8.57	17.84	7.27	47.1	0.03	90	-	290
Hidden Lake	3797	DBAS	9/16/97	-	2.5	5	4.2	8.63	17.79	7.27	47.1	0.03	90.4	-	286
Hidden Lake	3797	DBAS	9/16/97	-	2.5	4	5.2	8.75	17.73	7.24	47.1	0.03	91.7	-	281
Hidden Lake	3797	DBAS	9/16/97	-	2.5	3	6.2	8	17.44	7.12	49.2	0.03	83.4	-	278
Hidden Lake	3797	DBAS	9/16/97	-	2.5	2	7.2	7.77	17.12	7.07	50.9	0.03	80.4	-	264
Hidden Lake	3797	DBAS	9/16/97	-	2.5	1	8.2	7.96	17.05	7.05	51	0.03	82.3	-	245
Hidden Lake	3997	ASRA	9/29/97	-	3.5	10	0.2	9.65	17.34	7.45	48.2	0.03	101.6	-	350
Hidden Lake	3997	ASRA	9/29/97	-	3.5	9	1.6	9.68	16.21	7.44	48.1	0.03	99.6	-	349
Hidden Lake	3997	ASRA	9/29/97	-	3.5	8	2.4	9.67	15.91	7.44	48.2	0.03	98.8	-	348
Hidden Lake	3997	ASRA	9/29/97	-	3.5	7	3.2	9.61	15.86	7.42	48.2	0.03	98.1	-	347
Hidden Lake	3997	ASRA	9/29/97	-	3.5	6	4	9.5	15.82	7.4	48.2	0.03	97.1	-	346

Hidden Lake	3997	ASRA	9/29/97	-	3.5	5	4.7	9.4	15.77	7.37	48.3	0.03	95.7	-	344
Hidden Lake	3997	ASRA	9/29/97	-	3.5	4	5.6	9.36	15.67	7.34	48.1	0.03	95.2	-	340
Hidden Lake	3997	ASRA	9/29/97	-	3.5	3	6.4	8.83	15.47	7.33	48.7	0.03	89.4	-	333
Hidden Lake	3997	ASRA	9/29/97	-	3.5	2	7.2	9.16	15.34	7.35	48.9	0.03	92.4	-	328
Hidden Lake	3997	ASRA	9/29/97	-	3.5	1	8	9.44	15.32	7.36	48.6	0.03	95.2	-	319
Hidden Lake	4297	DBAS	10/20/97	-	2.5	9	0.3	10.76	11.63	7.44	54.2	0.03	97.8	-	350
Hidden Lake	4297	DBAS	10/20/97	-	2.5	8	1	10.76	11.43	7.46	54	0.03	97.5	-	349
Hidden Lake	4297	DBAS	10/20/97	-	2.5	7	2	10.76	11.25	7.42	54.2	0.03	97.1	-	351
Hidden Lake	4297	DBAS	10/20/97	-	2.5	6	3	10.64	11.12	7.39	54.3	0.03	95.7	-	351
Hidden Lake	4297	DBAS	10/20/97	-	2.5	5	4	10.71	11.05	7.38	54.1	0.03	96.2	-	350
Hidden Lake	4297	DBAS	10/20/97	-	2.5	4	5	10.72	11.02	7.37	54.2	0.03	96.2	-	349
Hidden Lake	4297	DBAS	10/20/97	-	2.5	3	6	10.75	11	7.31	54.3	0.03	96.5	-	351
Hidden Lake	4297	DBAS	10/20/97	-	2.5	2	7	10.77	11	7.28	54.2	0.03	96.6	-	351
Hidden Lake	4297	DBAS	10/20/97	-	2.5	1	8	10.89	10.86	7.25	54.3	0.03	97.4	-	350
Hidden Lake	4497	DBAS	11/3/97	-	2.4	9	0.2	11.64	7.48	8.83	53.2	0.03	100	*****	425
Hidden Lake	4497	DBAS	11/3/97	-	2.4	8	1	11.57	7.44	8.73	53.2	0.03	99.1	*****	427
Hidden Lake	4497	DBAS	11/3/97	-	2.4	7	2	11.5	7.44	8.65	53.1	0.03	98.3	*****	426
Hidden Lake	4497	DBAS	11/3/97	-	2.4	6	3	11.5	7.41	8.61	53.3	0.03	98.2	*****	425
Hidden Lake	4497	DBAS	11/3/97	-	2.4	5	4	11.48	7.43	8.61	53.2	0.03	98.1	*****	422
Hidden Lake	4497	DBAS	11/3/97	-	2.4	4	5	11.38	7.37	8.6	53.2	0.03	97.2	*****	423
Hidden Lake	4497	DBAS	11/3/97	-	2.4	3	6	11.17	7.36	8.45	53.5	0.03	95	*****	422
Hidden Lake	4497	DBAS	11/3/97	-	2.4	2	7	11.03	7.35	8.32	53.6	0.03	93.6	*****	422
Hidden Lake	4497	DBAS	11/3/97	-	2.4	1	7.8	11.02	7.36	8.32	53.7	0.03	93.3	*****	433
Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
Round Lake	1597	DBAC	5/16/97	-	0.4	12	0.2	11.03	10.79	7	26.7	0.02	99	-	372
Round Lake	1597	DBAC	5/16/97	-	0.4	11	0.2	11.11	10.63	7.03	27	0.02	99	-	372
Round Lake	1597	DBAC	5/16/97	-	0.4	10	0.2	11.09	10.63	7.05	27	0.02	98.9	-	371
Round Lake	1597	DBAC	5/16/97	-	0.4	9	1.7	11.09	10.33	7.04	26.9	0.02	98.3	-	373

Round Lake	1597	DBAC	5/16/97	-	0.4	8	1.7	11.06	10.35	7.03	26.8	0.02	98	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	7	1.7	11.07	10.36	7.02	26.9	0.02	98.2	-	374
Round Lake	1597	DBAC	5/16/97	-	0.4	6	2.8	11.15	8.61	7.06	26.5	0.02	94.7	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	5	2.8	11.13	8.6	7.06	26.5	0.02	94.5	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	4	2.8	11.1	8.59	7.06	26.5	0.02	94.2	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	3	3.9	11.17	8.33	7.06	26.4	0.02	94.3	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	2	3.9	11.2	8.32	7.06	26.3	0.02	94.5	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	1	3.9	11.24	8.3	7.06	26.6	0.02	94.8	-	373
Round Lake	2197	DBSS	5/29/97	-	1.4	12	0.3	11.02	10.86	7.11	26.5	0.02	99	-	365
Round Lake	2197	DBSS	5/29/97	-	1.4	11	0.3	11.03	10.92	7.1	26.4	0.02	99.3	-	366
Round Lake	2197	DBSS	5/29/97	-	1.4	10	0.2	11.01	11	7.1	26.2	0.02	99.3	-	366
Round Lake	2197	DBSS	5/29/97	-	1.4	9	1.2	11.39	9.71	7.11	26.6	0.02	99.7	-	366
Round Lake	2197	DBSS	5/29/97	-	1.4	8	1.2	11.37	9.69	7.13	26.7	0.02	99.4	-	366
Round Lake	2197	DBSS	5/29/97	-	1.4	7	1.2	11.35	9.73	7.12	26.7	0.02	99.4	-	366
Round Lake	2197	DBSS	5/29/97	-	1.4	6	2.4	11.44	9.5	7.09	26.7	0.02	99.5	-	368
Round Lake	2197	DBSS	5/29/97	-	1.4	5	2.4	11.44	9.51	7.1	26.3	0.02	99.4	-	368
Round Lake	2197	DBSS	5/29/97	-	1.4	4	2.4	11.5	9.45	7.1	26.7	0.02	99.8	-	367
Round Lake	2197	DBSS	5/29/97	-	1.4	3	3.3	11.53	9.2	7.09	26.7	0.02	99.6	-	368
Round Lake	2197	DBSS	5/29/97	-	1.4	2	3.3	11.54	9.22	7.08	26.4	0.02	99.7	-	369
Round Lake	2197	DBSS	5/29/97	-	1.4	1	3.3	11.54	9.23	7.09	26.4	0.02	99.8	-	368
Round Lake	2397	DBAS	6/11/97	-	1.8	10	0.3	10.67	13.47	7.14	29.4	0.02	102.1	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	9	0.3	10.65	13.45	7.15	29.6	0.02	101.9	-	397
Round Lake	2397	DBAS	6/11/97	-	1.8	8	0.3	10.67	13.45	7.15	29.5	0.02	102.1	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	7	1	11.08	11.69	7.19	29	0.02	101.9	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	6	1	11.02	11.81	7.19	29.1	0.02	101.6	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	5	1	10.99	12	7.19	29	0.02	101.8	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	4	0.9	10.85	12.21	7.19	29	0.02	100.9	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	3	1.5	11.29	11.28	7.21	28.6	0.02	102.8	-	401
Round Lake	2397	DBAS	6/11/97	-	1.8	2	1.5	11.25	11.38	7.22	28.7	0.02	102.7	-	400
Round Lake	2397	DBAS	6/11/97	-	1.8	1	1.6	11.27	11.43	7.21	28.6	0.02	103	-	401

Round Lake	2597	DBSS	6/26/97	-	1.5	10	0.3	11.34	11.69	7.21	32.4	0.02	104.1	-	398
Round Lake	2597	DBSS	6/26/97	-	1.5	9	0.3	11.37	11.7	7.21	31.9	0.02	104.3	-	398
Round Lake	2597	DBSS	6/26/97	-	1.5	8	0.3	11.26	11.95	7.2	32.1	0.02	104.2	-	399
Round Lake	2597	DBSS	6/26/97	-	1.5	7	0.9	11.34	11.21	7.18	32.1	0.02	103	-	401
Round Lake	2597	DBSS	6/26/97	-	1.5	6	0.9	11.25	11.23	7.19	32	0.02	102.2	-	400
Round Lake	2597	DBSS	6/26/97	-	1.5	5	1	11.3	11.02	7.2	31.9	0.02	102.2	-	401
Round Lake	2597	DBSS	6/26/97	-	1.5	4	1.4	11.28	10.98	7.19	31.7	0.02	101.9	-	401
Round Lake	2597	DBSS	6/26/97	-	1.5	3	1.4	11.32	10.92	7.2	31.9	0.02	102.1	-	402
Round Lake	2597	DBSS	6/26/97	-	1.5	2	1.5	11.31	10.95	7.2	31.9	0.02	102.1	-	402
Round Lake	2597	DBSS	6/26/97	-	1.5	1	1.6	11.32	10.95	7.19	31.8	0.02	102.1	-	403
Round Lake	2797	DBSS	7/8/97	-	0.6	2	0.2	9.73	16.76	7.33	35.3	0.02	99.6	-	399
Round Lake	2797	DBSS	7/8/97	-	0.6	1	0.6	10.33	16.11	7.36	35.1	0.02	*****	-	397
Round Lake	2997	SSJD	7/24/97	-	1.7	10	0.3	9.48	19.4	7.27	37.9	0.02	*****	-	405
Round Lake	2997	SSJD	7/24/97	-	1.7	9	0.3	9.47	19.26	7.26	37.9	0.02	*****	-	405
Round Lake	2997	SSJD	7/24/97	-	1.7	8	0.3	9.49	19.28	7.25	38	0.02	*****	-	406
Round Lake	2997	SSJD	7/24/97	-	1.7	7	0.9	9.37	18.66	7.25	37.8	0.02	99.8	-	408
Round Lake	2997	SSJD	7/24/97	-	1.7	6	0.9	9.31	18.63	7.26	37.8	0.02	99	-	408
Round Lake	2997	SSJD	7/24/97	-	1.7	5	0.9	9.36	18.66	7.25	37.8	0.02	99.6	-	408
Round Lake	2997	SSJD	7/24/97	-	1.7	4	0.9	9.37	18.7	7.25	37.9	0.02	99.6	-	408
Round Lake	2997	SSJD	7/24/97	-	1.7	3	1.7	9.47	18.51	7.32	37.8	0.02	*****	-	406
Round Lake	2997	SSJD	7/24/97	-	1.7	2	1.7	9.48	18.51	7.34	37.9	0.02	*****	-	408
Round Lake	2997	SSJD	7/24/97	-	1.7	1	1.7	9.56	18.51	7.38	37.9	0.02	*****	-	411
Round Lake	3197	DBSS	8/5/97	-	1.7	2	0.3	9.22	22.77	7.55	44.2	0.03	105.6	-	334
Round Lake	3197	DBSS	8/5/97	-	1.7	1	1.5	9.56	21.9	7.68	44.2	0.03	107.6	-	329
Round Lake	3297	DBSS	8/14/97	-	1.4	2	0.3	9.3	23.91	7.92	48.7	0.03	109.5	-	292
Round Lake	3297	DBSS	8/14/97	-	1.4	1	1.3	9.75	23.42	8.12	49.1	0.03	113.8	-	280

Round Lake	3497	DBSS	8/27/97	-	2.1	3	0.3	9.01	21.21	7.35	55.7	0.04	100.9	-	294
Round Lake	3497	DBSS	8/27/97	-	2.1	2	1	8.93	20.84	7.35	55.5	0.04	99.5	-	292
Round Lake	3497	DBSS	8/27/97	-	2.1	1	1.9	9.11	20.72	7.38	55.6	0.04	101.1	-	287
Round Lake	3797	DBAS	9/16/97	-	1.3	2	0.2	8.62	17.39	7.29	55.6	0.04	89.7	-	286
Round Lake	3797	DBAS	9/16/97	-	1.3	1	1	8.87	17.39	7.31	55.5	0.04	92.2	-	285
Round Lake	3997	ASRA	9/29/97	-	1.5	8	0.3	11.35	15.24	7.44	51.9	0.03	114.5	-	377
Round Lake	3997	ASRA	9/29/97	-	1.5	7	0.3	11.35	15.25	7.45	51.9	0.03	114.3	-	376
Round Lake	3997	ASRA	9/29/97	-	1.5	6	0.3	11.37	15.27	7.45	51.9	0.03	114.6	-	376
Round Lake	3997	ASRA	9/29/97	-	1.5	5	0.3	11.36	15.29	7.46	51.9	0.03	114.6	-	376
Round Lake	3997	ASRA	9/29/97	-	1.5	4	1.5	11.38	14.79	7.49	51.9	0.03	113.5	-	375
Round Lake	3997	ASRA	9/29/97	-	1.5	3	1.5	11.28	14.69	7.5	52.1	0.03	112.3	-	374
Round Lake	3997	ASRA	9/29/97	-	1.5	2	1.5	10.91	14.71	7.5	51.9	0.03	108.6	-	374
Round Lake	3997	ASRA	9/29/97	-	1.5	1	1.5	11.51	14.67	7.51	51.9	0.03	115.9	-	373
Round Lake	4297	DBAS	10/20/97	-	1.2	3	0.3	10.65	9.38	6.97	57.2	0.04	91.9	-	381
Round Lake	4297	DBAS	10/20/97	-	1.2	2	0.8	10.68	9.35	6.96	57.1	0.04	92.2	-	382
Round Lake	4297	DBAS	10/20/97	-	1.2	1	1.3	10.87	9.19	6.93	57.1	0.04	93.4	-	384
Round Lake	4497	DBAS	11/3/97	-	1	2	0.3	11.93	7.13	6.68	38.7	0.02	97.1	*****	429
Round Lake	4497	DBAS	11/3/97	-	1	1	1.2	11.99	7.11	6.68	38.5	0.02	97.6	*****	431

Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
Chatcolet Lake	1597	ASSS	4/18/97	-	1.5	3	0.5	12.66	6.96	7.41	38.3	0.02	*****	-	380
Chatcolet Lake	1597	ASSS	4/18/97	-	1.5	2	5.4	12.37	5.98	7.41	36.3	0.02	99.3	-	381
Chatcolet Lake	1597	ASSS	4/18/97	-	1.5	1	10.4	12.45	5.7	7.41	33.5	0.02	99	-	381

Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	14	0.2	11.31	14.46	7.12	33.7	0.02	110	-	368
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	13	0.8	11.32	13.83	7.08	33.3	0.02	108.6	-	371
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	12	1.8	11.46	12.2	7.03	32.6	0.02	106.3	-	373
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	11	2.7	11.37	11.66	7.01	32	0.02	103.9	-	374
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	10	3.7	11	10.94	6.95	30.5	0.02	98.7	-	376
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	9	4.7	10.91	9.76	6.93	28.8	0.02	95.4	-	378
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	8	5.6	10.84	9.3	6.9	10.84	*****	5.6	-	376
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	7	6.7	10.87	9.09	6.95	27.9	0.02	93.4	-	376
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	6	7.7	10.88	9.02	6.95	27.9	0.02	93.4	-	376
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	5	8.7	10.89	8.6	6.94	30.2	0.02	92.5	-	377
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	4	9.7	10.86	8.5	6.94	30.3	0.02	92.1	-	377
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	3	10.6	10.75	8.32	6.94	31	0.02	90.7	-	376
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	2	11.6	10.03	7.54	6.92	35.2	0.02	83.2	-	378
Chatcolet Lake	1997	DBSS	5/16/97	-	1.4	1	12.7	10.04	7.48	6.92	35.4	0.02	83	-	377
Chatcolet Lake	2197	DBSS	5/29/97	-	1.6	11	0.3	10.62	13.44	6.98	27.4	0.02	101.2	-	360
Chatcolet Lake	2197	DBSS	5/29/97	-	1.6	10	2.3	10.9	9.6	6.97	26.8	0.02	95	-	363
Chatcolet Lake	2197	DBSS	5/29/97	-	1.6	9	3.4	10.8	8.6	6.98	26.7	0.02	91.9	-	362
Chatcolet Lake	2197	DBSS	5/29/97	-	1.6	8	4.5	10.85	8.55	6.96	26.6	0.02	92.2	-	363
Chatcolet Lake	2197	DBSS	5/29/97	-	1.6	7	6.5	10.88	8.35	6.96	26.5	0.02	92.1	-	362
Chatcolet Lake	2197	DBSS	5/29/97	-	1.6	6	7.4	10.88	8.29	6.95	26.4	0.02	91.9	-	362
Chatcolet Lake	2197	DBSS	5/29/97	-	1.6	5	8.4	11.07	8.11	6.95	26.5	0.02	93.1	-	361
Chatcolet Lake	2197	DBSS	5/29/97	-	1.6	4	9.3	11.05	7.88	6.95	26.4	0.02	92.4	-	360
Chatcolet Lake	2197	DBSS	5/29/97	-	1.6	3	10.4	11.03	7.86	6.93	26.4	0.02	92.2	-	360
Chatcolet Lake	2197	DBSS	5/29/97	-	1.6	2	11.4	11	7.78	6.92	26.4	0.02	91.8	-	359
Chatcolet Lake	2197	DBSS	5/29/97	-	1.6	1	12.3	10.3	7.73	6.91	27.3	0.02	85.8	-	359
Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	12	0.1	11.24	12.99	7.2	29.1	0.02	106.4	-	417
Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	11	1	11.23	11.66	7.23	28.3	0.02	103.2	-	417
Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	10	1.9	11.08	10.38	7.21	27.5	0.02	98.8	-	419
Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	9	3	11.09	10	7.19	27.5	0.02	98	-	421
Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	8	3.9	11.16	9.82	7.19	27.2	0.02	98.1	-	421

Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	7	4.9	11.2	9.72	7.19	27.1	0.02	98.2	-	421
Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	6	6	11.07	9.67	7.2	27.1	0.02	97	-	421
Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	5	7	11.15	9.15	7.21	26.9	0.02	96.5	-	421
Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	4	8	11.07	9.02	7.21	27	0.02	95.5	-	421
Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	3	8.9	10.94	8.99	7.23	27.1	0.02	94.3	-	421
Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	2	9.8	10.84	9.04	7.26	27.3	0.02	93.5	-	419
Chatcolet Lake	2397	DBAS	6/13/97	-	2.1	1	10.9	10.85	8.99	7.29	27.3	0.02	93.4	-	417
Chatcolet Lake	2597	DBSS	6/26/97	-	2.5	11	0.3	10.94	14.59	7.21	31.5	0.02	107.3	-	373
Chatcolet Lake	2597	DBSS	6/26/97	-	2.5	10	1.4	10.94	14.45	7.17	31.5	0.02	106.9	-	375
Chatcolet Lake	2597	DBSS	6/26/97	-	2.5	9	2.5	11.03	13.45	7.17	31.5	0.02	105.5	-	375
Chatcolet Lake	2597	DBSS	6/26/97	-	2.5	8	3.6	10.97	13.25	7.15	31.4	0.02	104.4	-	375
Chatcolet Lake	2597	DBSS	6/26/97	-	2.5	7	4.6	10.99	12.95	7.12	31.2	0.02	103.8	-	375
Chatcolet Lake	2597	DBSS	6/26/97	-	2.5	6	5.6	10.93	12.74	7.09	31.5	0.02	102.8	-	374
Chatcolet Lake	2597	DBSS	6/26/97	-	2.5	5	6.6	10.97	12.1	7.04	31.6	0.02	101.8	-	375
Chatcolet Lake	2597	DBSS	6/26/97	-	2.5	4	7.7	10.35	10.92	7	30.9	0.02	93.4	-	375
Chatcolet Lake	2597	DBSS	6/26/97	-	2.5	3	8.7	9.68	10.68	6.98	30.2	0.02	86.8	-	374
Chatcolet Lake	2597	DBSS	6/26/97	-	2.5	2	9.7	9.38	10.12	6.99	30.4	0.02	83	-	372
Chatcolet Lake	2597	DBSS	6/26/97	-	2.5	1	10.6	9.44	10.1	7.02	30.6	0.02	83.5	-	370
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	12	0.3	10.25	17.45	7.19	35.2	0.02	*****	-	411
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	11	0.9	10.23	17.39	7.17	35.2	0.02	*****	-	411
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	10	2.1	10.2	17.17	7.11	35.1	0.02	*****	-	413
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	9	3.1	9.99	16.11	7.05	35.1	0.02	*****	-	416
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	8	4	9.88	15.35	7.02	34.9	0.02	98.1	-	417
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	7	5	9.83	14.71	6.97	33.8	0.02	96.2	-	418
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	6	6	9.84	13.13	6.94	33.3	0.02	93	-	420
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	5	7	9.5	12.69	6.91	33.1	0.02	88.9	-	421
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	4	8.1	8.93	12.39	6.89	33.3	0.02	83	-	421
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	3	9	9.12	12.25	6.89	33.2	0.02	84.5	-	421
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	2	10.1	8.4	11.77	6.9	33.3	0.02	77	-	418
Chatcolet Lake	2797	DBSS	7/8/97	-	1.8	1	11	8.23	11.64	7	33.7	0.02	75.2	-	423

Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	12	0.6	9.86	22.15	7.99	36.4	0.02	*****	-	378
Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	11	1.8	9.85	22.15	7.96	36.4	0.02	*****	-	378
Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	10	2.9	9.97	21.67	7.85	36.8	0.02	*****	-	379
Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	9	3.9	9.81	19.33	7.18	35.8	0.02	*****	-	402
Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	8	4.9	10.24	16.32	7.08	33.2	0.02	*****	-	406
Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	7	5.9	9.79	14.49	6.93	32.4	0.02	95.4	-	410
Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	6	6.9	8.29	13.58	6.84	32.1	0.02	79.2	-	413
Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	5	7.9	7.71	13.1	6.82	32.2	0.02	72.9	-	413
Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	4	8.9	6.88	12.72	6.82	32.4	0.02	64.5	-	411
Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	3	10	5.03	12.03	6.87	34.1	0.02	46.5	-	408
Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	2	10.9	5.19	12.08	6.97	34.1	0.02	47.9	-	402
Chatcolet Lake	2997	SSJD	7/24/97	-	3.7	1	0	0	0	0	0	0	0	-	0
Chatcolet Lake	3197	DBSS	8/5/97	-	3	13	0.3	11.59	24.51	9.28	42.3	0.03	137.1	-	289
Chatcolet Lake	3197	DBSS	8/5/97	-	3	12	1.7	11.55	24.37	9.22	42.2	0.03	136.3	-	290
Chatcolet Lake	3197	DBSS	8/5/97	-	3	11	2.7	10.64	23.4	8.86	40.4	0.03	123.3	-	299
Chatcolet Lake	3197	DBSS	8/5/97	-	3	10	3.6	10.13	22.02	7.49	39.2	0.03	114.4	-	331
Chatcolet Lake	3197	DBSS	8/5/97	-	3	9	4.6	9.8	18.9	7.05	35.8	0.02	104.2	-	349
Chatcolet Lake	3197	DBSS	8/5/97	-	3	8	5.6	9.77	16.32	6.97	33	0.02	98.4	-	351
Chatcolet Lake	3197	DBSS	8/5/97	-	3	7	6.5	8.09	14.44	6.84	33	0.02	78.2	-	353
Chatcolet Lake	3197	DBSS	8/5/97	-	3	6	7.5	6.42	13.55	6.79	33.4	0.02	60.9	-	353
Chatcolet Lake	3197	DBSS	8/5/97	-	3	5	8.4	5.49	13.15	6.79	33.6	0.02	51.6	-	351
Chatcolet Lake	3197	DBSS	8/5/97	-	3	4	9.5	3.45	12.3	6.81	36.1	0.02	31.8	-	347
Chatcolet Lake	3197	DBSS	8/5/97	-	3	3	10.5	3.05	12.11	6.89	36.7	0.02	28	-	342
Chatcolet Lake	3197	DBSS	8/5/97	-	3	2	11.5	2.57	12.07	7.03	38.4	0.02	23.5	-	335
Chatcolet Lake	3197	DBSS	8/5/97	-	3	1	12.4	2.5	12.13	7.18	39.3	0.03	23	-	343
Chatcolet Lake	3297	DBSS	8/13/97	-	3.5	10	0.8	9.41	22.99	8.77	42.9	0.03	108.9	-	339
Chatcolet Lake	3297	DBSS	8/13/97	-	3.5	9	1.8	9.41	22.58	8.71	42.7	0.03	108.2	-	341
Chatcolet Lake	3297	DBSS	8/13/97	-	3.5	8	2.8	9.27	21.79	8.4	42	0.03	104.7	-	348
Chatcolet Lake	3297	DBSS	8/13/97	-	3.5	7	3.8	8.8	21	7.58	39.8	0.03	98	-	371

Chatcolet Lake	3297	DBSS	8/13/97	-	3.5	6	4.8	8.7	20.35	7.29	39.1	0.03	95.7	-	379
Chatcolet Lake	3297	DBSS	8/13/97	-	3.5	5	5.8	8.91	18.18	6.95	35.4	0.02	93.9	-	392
Chatcolet Lake	3297	DBSS	8/13/97	-	3.5	4	6.8	6.33	15.19	6.8	34.4	0.02	62.6	-	399
Chatcolet Lake	3297	DBSS	8/13/97	-	3.5	3	7.9	5.85	14.18	6.8	34.9	0.02	56.6	-	399
Chatcolet Lake	3297	DBSS	8/13/97	-	3.5	2	8.8	4.53	13.48	6.82	35.8	0.02	43.2	-	399
Chatcolet Lake	3297	DBSS	8/13/97	-	3.5	1	9.8	2.8	13.1	6.87	39.2	0.03	26.5	-	398
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	12	0.4	9.51	21.99	8.48	47.3	0.03	108.2	-	271
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	11	0.7	9.54	21.97	8.49	47.4	0.03	108.4	-	267
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	10	1.7	9.55	21.93	8.47	47.4	0.03	108.5	-	267
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	9	2.7	9.52	21.65	8.38	47.3	0.03	107.5	-	267
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	8	3.7	9.54	21.51	8.34	48.8	0.03	107.5	-	265
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	7	4.7	9.29	21.19	7.74	45.6	0.03	104.1	-	276
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	6	5.7	8.58	20.37	7.14	44.4	0.03	94.7	-	297
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	5	6.7	5.59	17.27	6.77	40.6	0.03	57.9	-	313
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	4	7.7	4.07	16.17	6.73	40.6	0.03	41.1	-	311
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	3	8.8	1.34	13.79	6.75	42.7	0.03	12.9	-	305
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	2	9.8	0.64	13.33	6.84	46.9	0.03	6.1	-	296
Chatcolet Lake	3497	DBSS	8/27/97	-	4.4	1	10.7	0.52	13.09	6.98	49	0.03	4.9	-	284
Chatcolet Lake	3797	DBAS	9/16/97	-	2.2	11	0.3	9.12	17.71	7.49	46.4	0.03	95.6	-	251
Chatcolet Lake	3797	DBAS	9/16/97	-	2.2	10	1.7	9.11	17.71	7.48	46.4	0.03	95.4	-	248
Chatcolet Lake	3797	DBAS	9/16/97	-	2.2	9	2.7	9.05	17.69	7.45	46.4	0.03	94.8	-	246
Chatcolet Lake	3797	DBAS	9/16/97	-	2.2	8	3.7	9.02	17.67	7.42	46.4	0.03	94.4	-	244
Chatcolet Lake	3797	DBAS	9/16/97	-	2.2	7	4.7	8.93	17.66	7.39	46.3	0.03	93.5	-	241
Chatcolet Lake	3797	DBAS	9/16/97	-	2.2	6	5.7	9.01	17.56	7.31	46.1	0.03	93.8	-	231
Chatcolet Lake	3797	DBAS	9/16/97	-	2.2	5	6.7	8.67	17.49	7.23	45.9	0.03	90.4	-	219
Chatcolet Lake	3797	DBAS	9/16/97	-	2.2	4	7.7	8.58	17.49	7.15	45.8	0.03	89.5	-	205
Chatcolet Lake	3797	DBAS	9/16/97	-	2.2	3	8.7	2.12	16.21	6.79	46.4	0.03	21	-	156
Chatcolet Lake	3797	DBAS	9/16/97	-	2.2	2	9.7	0.27	12.49	6.72	74.3	0.05	2.4	-	34
Chatcolet Lake	3797	DBAS	9/16/97	-	2.2	1	10.7	0.35	12.36	6.69	77.1	0.05	3.3	-	42

Chatcolet Lake	3997	ASRA	9/29/97	-	3.3	11	0.6	9.55	16.12	7.43	48.5	0.03	98	-	362
Chatcolet Lake	3997	ASRA	9/29/97	-	3.3	10	1.6	9.51	15.72	7.41	48.3	0.03	96.8	-	362
Chatcolet Lake	3997	ASRA	9/29/97	-	3.3	9	2.6	9.25	15.67	7.37	48.3	0.03	94.1	-	363
Chatcolet Lake	3997	ASRA	9/29/97	-	3.3	8	3.6	9.15	15.54	7.35	48.4	0.03	92.8	-	362
Chatcolet Lake	3997	ASRA	9/29/97	-	3.3	7	4.6	8.95	15.47	7.31	48.4	0.03	90.7	-	362
Chatcolet Lake	3997	ASRA	9/29/97	-	3.3	6	5.6	8.67	15.37	7.3	48.7	0.03	87.6	-	362
Chatcolet Lake	3997	ASRA	9/29/97	-	3.3	5	6.6	8.63	15.32	7.3	48.7	0.03	87.1	-	361
Chatcolet Lake	3997	ASRA	9/29/97	-	3.3	4	7.6	8.53	15.27	7.3	48.8	0.03	86.2	-	359
Chatcolet Lake	3997	ASRA	9/29/97	-	3.3	3	8.6	8.41	15.22	7.3	48.9	0.03	84.7	-	358
Chatcolet Lake	3997	ASRA	9/29/97	-	3.3	2	9.6	8.06	15.06	7.29	49.4	0.03	80.8	-	356
Chatcolet Lake	3997	ASRA	9/29/97	-	3.3	1	10.6	7.99	14.99	7.32	50.4	0.03	80	-	353
Chatcolet Lake	4297	DBAS	10/20/97	-	2.8	11	0.3	11.17	11.63	7.54	54.9	0.04	101.7	-	372
Chatcolet Lake	4297	DBAS	10/20/97	-	2.8	10	1	11.1	11.56	7.5	55	0.04	100.9	-	373
Chatcolet Lake	4297	DBAS	10/20/97	-	2.8	9	2	11.08	11.25	7.5	54.7	0.04	100	-	373
Chatcolet Lake	4297	DBAS	10/20/97	-	2.8	8	3	11.05	11.23	7.45	54.9	0.04	99.6	-	375
Chatcolet Lake	4297	DBAS	10/20/97	-	2.8	7	4	10.97	11.17	7.4	54.6	0.03	98.8	-	376
Chatcolet Lake	4297	DBAS	10/20/97	-	2.8	6	5	10.89	11.13	7.32	54.5	0.03	98	-	378
Chatcolet Lake	4297	DBAS	10/20/97	-	2.8	5	6	10.81	11.07	7.24	54.5	0.03	97.1	-	381
Chatcolet Lake	4297	DBAS	10/20/97	-	2.8	4	7	10.67	11.04	7.15	54.6	0.03	95.8	-	384
Chatcolet Lake	4297	DBAS	10/20/97	-	2.8	3	8	10.53	11	7.08	54.6	0.03	94.5	-	386
Chatcolet Lake	4297	DBAS	10/20/97	-	2.8	2	9	9.17	10.74	6.92	56.4	0.04	81.8	-	392
Chatcolet Lake	4297	DBAS	10/20/97	-	2.8	1	10	8.97	10.64	6.88	56.8	0.04	79.8	-	393
Chatcolet Lake	4497	DBAS	11/3/97	-	2	11	0.2	11.7	7.53	8.55	53.1	0.03	99.8	*****	418
Chatcolet Lake	4497	DBAS	11/3/97	-	2	10	1	11.7	7.5	8.55	53.3	0.03	99.8	*****	419
Chatcolet Lake	4497	DBAS	11/3/97	-	2	9	2	11.69	7.45	8.5	53.2	0.03	99.5	*****	421
Chatcolet Lake	4497	DBAS	11/3/97	-	2	8	3	11.69	7.43	8.4	53.2	0.03	99.3	*****	419
Chatcolet Lake	4497	DBAS	11/3/97	-	2	7	4	11.69	7.39	8.38	53.1	0.03	99.3	*****	420
Chatcolet Lake	4497	DBAS	11/3/97	-	2	6	5	11.7	7.38	8.37	53.1	0.03	99.4	*****	417
Chatcolet Lake	4497	DBAS	11/3/97	-	2	5	6	11.72	7.37	8.33	53.1	0.03	99.4	*****	416
Chatcolet Lake	4497	DBAS	11/3/97	-	2	4	7	11.77	7.31	8.19	52.5	0.03	99.5	*****	417

Chatcolet Lake	4497	DBAS	11/3/97	-	2	3	8	11.73	7.29	7.97	52	0.03	98.6	*****	416
Chatcolet Lake	4497	DBAS	11/3/97	-	2	2	9	11.46	7.25	7.55	52.2	0.03	95.4	*****	415
Chatcolet Lake	4497	DBAS	11/3/97	-	2	1	9.8	11.55	7.26	6.91	47.7	0.03	94.6	*****	414

Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
Chatcolet Shallow	1597	ASSS	4/18/97	-	0.5	2	0.2	12.75	5.46	7.43	32.4	0.02	*****	-	325
Chatcolet Shallow	1597	ASSS	4/18/97	-	0.5	1	0.7	13.38	5.47	7.41	32.6	0.02	*****	-	320
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	13	0.3	11.04	10.48	6.99	27.2	0.02	98.1	-	369
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	12	0.3	11.05	10.49	7	27.2	0.02	98.2	-	369
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	11	0.3	11.04	10.44	7.01	27.3	0.02	98	-	369
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	10	0.3	11.03	10.46	7.01	27.2	0.02	98	-	369
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	9	1.3	11.02	9.97	6.97	27	0.02	95.7	-	374
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	8	1.3	11	9.89	6.96	27.1	0.02	96.4	-	374
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	7	1.3	11.01	9.51	6.99	27	0.02	95.6	-	373
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	6	1.3	10.97	10.15	6.95	27.4	0.02	96.7	-	375
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	5	3.1	11.21	8.56	7	26.4	0.02	95.1	-	375
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	4	3.1	11.21	8.58	6.99	26.3	0.02	95.2	-	375
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	3	3.1	11.22	8.55	6.99	26.3	0.02	95.2	-	376
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	2	3.1	11.22	8.59	7	26.3	0.02	95.3	-	375
Chatcolet Shallow	1997	DBSS	5/16/97	-	0.3	1	3.1	11.21	8.56	7.01	26.4	0.02	95.1	-	375
Chatcolet Shallow	2197	DBSS	5/29/97	-	1.6	10	0.2	10.8	11.38	7.04	26.8	0.02	98.2	-	368
Chatcolet Shallow	2197	DBSS	5/29/97	-	1.6	9	0.2	10.85	11.72	7.1	18.3	0.01	99.5	-	363
Chatcolet Shallow	2197	DBSS	5/29/97	-	1.6	8	0.2	10.87	11.59	7.1	15.3	0.01	99.3	-	364
Chatcolet Shallow	2197	DBSS	5/29/97	-	1.6	7	1.4	11.32	9.74	7.07	26.7	0.02	99	-	368
Chatcolet Shallow	2197	DBSS	5/29/97	-	1.6	6	1.4	11.32	9.69	7.07	26.7	0.02	99.1	-	368
Chatcolet Shallow	2197	DBSS	5/29/97	-	1.6	5	1.4	11.35	9.68	7.08	26.6	0.02	99.4	-	368
Chatcolet Shallow	2197	DBSS	5/29/97	-	1.6	4	2.3	11.51	9.32	7.08	26.5	0.02	99.7	-	369
Chatcolet Shallow	2197	DBSS	5/29/97	-	1.6	3	2.3	11.53	9.32	7.08	26.5	0.02	99.9	-	369

Chatcolet Shallow	2197	DBSS	5/29/97	-	1.6	2	2.3	11.52	9.33	7.07	26.5	0.02	100	-	369
Chatcolet Shallow	2197	DBSS	5/29/97	-	1.6	1	2.4	11.57	9.35	7.08	26.6	0.02	100.3	-	368
Chatcolet Shallow	2397	DBAS	6/11/97	-	1.6	10	0.4	10.75	11.8	7.09	28.7	0.02	99.1	-	394
Chatcolet Shallow	2397	DBAS	6/11/97	-	1.6	9	0.4	10.7	11.74	7.1	28.8	0.02	98.5	-	395
Chatcolet Shallow	2397	DBAS	6/11/97	-	1.6	8	0.3	10.71	11.86	7.11	28.7	0.02	98.8	-	394
Chatcolet Shallow	2397	DBAS	6/11/97	-	1.6	7	0.9	10.95	11.15	7.1	28.7	0.02	99.4	-	396
Chatcolet Shallow	2397	DBAS	6/11/97	-	1.6	6	0.9	10.93	11.31	7.11	28.5	0.02	99.6	-	396
Chatcolet Shallow	2397	DBAS	6/11/97	-	1.6	5	0.9	10.94	11.18	7.12	28.3	0.02	99.4	-	395
Chatcolet Shallow	2397	DBAS	6/11/97	-	1.6	4	0.9	10.97	11.1	7.11	28.4	0.02	99.5	-	396
Chatcolet Shallow	2397	DBAS	6/11/97	-	1.6	3	1.5	11.07	10.98	7.11	28.3	0.02	100.1	-	398
Chatcolet Shallow	2397	DBAS	6/11/97	-	1.6	2	1.5	11.12	10.89	7.11	28.4	0.02	100.4	-	398
Chatcolet Shallow	2397	DBAS	6/11/97	-	1.6	1	1.5	11.16	10.88	7.12	28.3	0.02	100.7	-	398
Chatcolet Shallow	2597	DBAC	6/26/97	-	0.7	10	0.2	11.42	11.88	7.25	31.8	0.02	105.4	-	388
Chatcolet Shallow	2597	DBAC	6/26/97	-	0.7	9	0.2	11.38	11.97	6.9	0.7	0	105.1	-	405
Chatcolet Shallow	2597	DBAC	6/26/97	-	0.7	8	0.2	11.43	11.9	7.25	31.8	0.02	105.4	-	389
Chatcolet Shallow	2597	DBAC	6/26/97	-	0.7	7	0.2	11.44	11.88	7.26	31.8	0.02	105.6	-	389
Chatcolet Shallow	2597	DBAC	6/26/97	-	0.7	6	0.2	11.44	11.92	7.26	31.8	0.02	105.5	-	389
Chatcolet Shallow	2597	DBAC	6/26/97	-	0.7	5	0.7	11.39	11.87	7.24	31.9	0.02	105	-	392
Chatcolet Shallow	2597	DBAC	6/26/97	-	0.7	4	0.7	11.41	11.85	7.27	31.8	0.02	105.2	-	391
Chatcolet Shallow	2597	DBAC	6/26/97	-	0.7	3	0.7	11.43	11.84	7.27	31.8	0.02	105.3	-	391
Chatcolet Shallow	2597	DBAC	6/26/97	-	0.7	2	0.7	11.4	11.87	7.27	31.8	0.02	105.2	-	391
Chatcolet Shallow	2597	DBAC	6/26/97	-	0.7	1	0.7	11.44	11.87	7.27	31.8	0.02	105.5	-	391
Chatcolet Shallow	2797	DBSS	7/8/97	-	0.7	2	0.2	10.12	16.22	7.28	35.2	0.02	*****	-	406
Chatcolet Shallow	2797	DBSS	7/8/97	-	0.7	1	0.8	10.17	16.19	7.29	35.2	0.02	*****	-	409
Chatcolet Shallow	2997	SSJD	7/24/97	-	0.8	10	0.3	11.24	22.77	9.09	38.9	0.02	*****	-	356
Chatcolet Shallow	2997	SSJD	7/24/97	-	0.8	9	0.3	11.33	22.93	9.1	39	0.02	*****	-	357
Chatcolet Shallow	2997	SSJD	7/24/97	-	0.8	8	0.3	11.39	23.04	9.12	39	0.03	*****	-	356
Chatcolet Shallow	2997	SSJD	7/24/97	-	0.8	7	0.3	11.5	22.99	9.1	39	0.03	*****	-	357

Chatcolet Shallow	2997	SSJD	7/24/97	-	0.8	6	0.2	11.19	22.95	9.03	39	0.02	*****	-	361
Chatcolet Shallow	2997	SSJD	7/24/97	-	0.8	5	1	11.36	20.13	8.43	38.2	0.02	*****	-	382
Chatcolet Shallow	2997	SSJD	7/24/97	-	0.8	4	1	11.45	20.09	8.47	38	0.02	*****	-	379
Chatcolet Shallow	2997	SSJD	7/24/97	-	0.8	3	1	11.51	20.11	8.49	38.1	0.02	*****	-	378
Chatcolet Shallow	2997	SSJD	7/24/97	-	0.8	2	0	11.47	20.18	8.45	38.1	0.02	*****	-	379
Chatcolet Shallow	2997	SSJD	7/24/97	-	0.8	1	1	11.55	20.09	8.47	38	0.02	*****	-	378
Chatcolet Shallow	3197	DBSS	8/5/97	-	1	2	0.3	12.26	25.72	9.28	46	0.03	148.1	-	295
Chatcolet Shallow	3197	DBSS	8/5/97	-	1	1	0.9	12.94	22.95	9.04	46.6	0.03	148.9	-	304
Chatcolet Shallow	3297	DBSS	8/14/97	-	1.1	2	0.3	11.62	24.37	9.54	53.3	0.03	138	-	279
Chatcolet Shallow	3297	DBSS	8/14/97	-	1.1	1	1.1	11.73	24.29	9.63	52.4	0.03	139.1	-	276
CHATSH	3497	DBSS	8/27/97	-	0.8	1	0.8	11.39	21.49	8.62	56.9	0.04	128.4	-	277
Chatcolet Shallow	3797	DBAS	9/16/97	-	1	1	0.8	10.41	15.56	7.79	54.3	0.03	104.2	-	256
Chatcolet Shallow	3997	ASRA	9/29/97	-	0.4	1	0.4	12.26	16.46	8.31	53.6	0.03	126.8	-	362
Chatcolet Shallow	4297	DBAS	10/20/97	-	1	2	0.3	10.98	10.61	7.11	53.4	0.03	97.6	-	372
Chatcolet Shallow	4297	DBAS	10/20/97	-	1	1	0.7	10.16	9.02	7	57.2	0.04	87	-	379
Chatcolet Shallow	4497	DBAS	11/3/97	-	0.9	2	0.2	11.72	7.28	6.97	42.6	0.03	96.2	*****	418
Chatcolet Shallow	4497	DBAS	11/3/97	-	0.9	1	0.8	11.86	7.26	6.96	43	0.03	97.3	*****	424

Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
Benewah Lake	1597	ASSS	4/18/97	-	0.8	3	0.2	11.66	9.27	7.36	28.1	0.02	*****	-	363
Benewah Lake	1597	ASSS	4/18/97	-	0.8	2	1.6	11.46	8.92	7.32	27.9	0.02	99	-	367
Benewah Lake	1597	ASSS	4/18/97	-	0.8	1	4.3	11.42	7.02	7.36	24.8	0.02	*****	-	366
Benewah Lake	1997	DBSS	5/16/97	-	1.1	10	0.3	10.12	16.39	6.97	31.6	0.02	102.6	-	369

Benewah Lake	1997	DBSS	5/16/97	-	1.1	9	1.1	9.81	15.1	6.95	31.2	0.02	96.8	-	371
Benewah Lake	1997	DBSS	5/16/97	-	1.1	8	1.8	11.11	8.71	7	26.6	0.02	94.8	-	372
Benewah Lake	1997	DBSS	5/16/97	-	1.1	7	2.5	11.1	8.53	7.02	26.6	0.02	94.1	-	372
Benewah Lake	1997	DBSS	5/16/97	-	1.1	6	3.3	11.07	8.4	7.01	26.5	0.02	93.6	-	372
Benewah Lake	1997	DBSS	5/16/97	-	1.1	5	3.9	11.04	8.38	7.01	26.7	0.02	93.3	-	372
Benewah Lake	1997	DBSS	5/16/97	-	1.1	4	4.7	11	8.36	7.02	26.7	0.02	92.9	-	372
Benewah Lake	1997	DBSS	5/16/97	-	1.1	3	5.6	10.94	8.36	7.03	27	0.02	92.5	-	371
Benewah Lake	1997	DBSS	5/16/97	-	1.1	2	6.2	10.8	8.35	7.02	27.2	0.02	91	-	371
Benewah Lake	1997	DBSS	5/16/97	-	1.1	1	7	10.47	8.25	7.04	27.7	0.02	88.2	-	371
Benewah Lake	2197	DBSS	5/29/97	-	2	12	0.8	10.09	13.9	6.97	28	0.02	97.1	-	351
Benewah Lake	2197	DBSS	5/29/97	-	2	11	0.8	10.05	13.88	6.97	27.6	0.02	96.7	-	350
Benewah Lake	2197	DBSS	5/29/97	-	2	10	1.8	10.85	9.35	6.97	27	0.02	94.1	-	351
Benewah Lake	2197	DBSS	5/29/97	-	2	9	1.8	11.02	9.17	6.96	27	0.02	95.1	-	351
Benewah Lake	2197	DBSS	5/29/97	-	2	8	2.8	11.1	8.71	6.94	26.7	0.02	94.8	-	351
Benewah Lake	2197	DBSS	5/29/97	-	2	7	2.8	11.08	8.65	6.96	26.7	0.02	94.4	-	350
Benewah Lake	2197	DBSS	5/29/97	-	2	6	3.9	10.82	8.37	6.92	26.8	0.02	91.6	-	350
Benewah Lake	2197	DBSS	5/29/97	-	2	5	3.9	10.83	8.35	6.93	26.6	0.02	91.6	-	349
Benewah Lake	2197	DBSS	5/29/97	-	2	4	4.9	10.54	7.89	6.92	26.5	0.02	88.2	-	346
Benewah Lake	2197	DBSS	5/29/97	-	2	3	4.9	10.59	7.89	6.92	26.7	0.02	88.6	-	347
Benewah Lake	2197	DBSS	5/29/97	-	2	2	5.9	10.3	7.66	6.92	26.6	0.02	85.7	-	352
Benewah Lake	2197	DBSS	5/29/97	-	2	1	5.9	10.35	7.65	6.92	26.5	0.02	86.1	-	350
Benewah Lake	2397	DBAS	6/11/97	-	2.5	10	0.4	9.39	17.73	6.99	32.6	0.02	98.5	-	399
Benewah Lake	2397	DBAS	6/11/97	-	2.5	9	0.4	9.43	17.83	7	32.5	0.02	99.1	-	399
Benewah Lake	2397	DBAS	6/11/97	-	2.5	8	0.3	9.43	17.9	7	32.4	0.02	99.2	-	399
Benewah Lake	2397	DBAS	6/11/97	-	2.5	7	0.9	9.82	15.89	7.01	32.7	0.02	99.1	-	399
Benewah Lake	2397	DBAS	6/11/97	-	2.5	6	1.9	10.25	14.21	7	30.3	0.02	99.8	-	400
Benewah Lake	2397	DBAS	6/11/97	-	2.5	5	2.8	11.19	11.04	6.95	28.6	0.02	101.4	-	402
Benewah Lake	2397	DBAS	6/11/97	-	2.5	4	3.9	9.41	8.78	6.86	28.8	0.02	80.9	-	407
Benewah Lake	2397	DBAS	6/11/97	-	2.5	3	4.8	8.36	8.6	6.85	30.2	0.02	71.5	-	407
Benewah Lake	2397	DBAS	6/11/97	-	2.5	2	4.8	8.38	8.6	6.86	29.9	0.02	71.6	-	407

Benewah Lake	2397	DBAS	6/11/97	-	2.5	1	4.8	8.41	8.56	6.87	29.7	0.02	71.8	-	406
Benewah Lake	2597	DBSS	6/26/97	-	3.1	12	0.3	10.31	18.63	7.36	33.9	0.02	110	-	384
Benewah Lake	2597	DBSS	6/26/97	-	3.1	11	0.3	10.3	18.65	7.36	33.9	0.02	110	-	383
Benewah Lake	2597	DBSS	6/26/97	-	3.1	10	0.9	10.32	18.57	7.34	33.9	0.02	110	-	384
Benewah Lake	2597	DBSS	6/26/97	-	3.1	9	0.9	10.31	18.59	7.32	33.9	0.02	109.9	-	384
Benewah Lake	2597	DBSS	6/26/97	-	3.1	8	1.9	10.39	17.97	7.22	34	0.02	109.4	-	386
Benewah Lake	2597	DBSS	6/26/97	-	3.1	7	1.9	10.33	18.02	7.21	33.8	0.02	108.9	-	386
Benewah Lake	2597	DBSS	6/26/97	-	3.1	6	2.8	11.07	13.35	7.02	31.1	0.02	105.6	-	391
Benewah Lake	2597	DBSS	6/26/97	-	3.1	5	2.8	11.04	13.35	7	30.9	0.02	105.3	-	391
Benewah Lake	2597	DBSS	6/26/97	-	3.1	4	3.7	8.49	10.92	6.78	30.5	0.02	76.6	-	398
Benewah Lake	2597	DBSS	6/26/97	-	3.1	3	3.7	8.43	10.9	6.78	30.3	0.02	76	-	398
Benewah Lake	2597	DBSS	6/26/97	-	3.1	2	4.7	5.4	9.84	6.77	33.7	0.02	47.5	-	398
Benewah Lake	2597	DBSS	6/26/97	-	3.1	1	4.7	5.43	9.84	6.78	33.7	0.02	47.7	-	398
Benewah Lake	2797	DBSS	7/8/97	-	2.3	6	0.3	10.59	21.76	8.31	35.9	0.02	*****	-	370
Benewah Lake	2797	DBSS	7/8/97	-	2.3	5	0.8	10.62	21.56	7.85	36	0.02	*****	-	377
Benewah Lake	2797	DBSS	7/8/97	-	2.3	4	1.8	11.49	17.39	7.29	35.3	0.02	*****	-	398
Benewah Lake	2797	DBSS	7/8/97	-	2.3	3	2.7	11.51	14.86	7.09	33.8	0.02	*****	-	408
Benewah Lake	2797	DBSS	7/8/97	-	2.3	2	3.6	9.61	13.13	6.92	33.1	0.02	90.9	-	417
Benewah Lake	2797	DBSS	7/8/97	-	2.3	1	4.6	5.87	11.66	6.9	36	0.02	53.6	-	421
Benewah Lake	2997	SSJD	7/24/97	-	3	10	0.4	10.59	23.51	9.06	37.8	0.02	*****	-	356
Benewah Lake	2997	SSJD	7/24/97	-	3	9	0	10.66	23.29	9.02	37.8	0.02	*****	-	358
Benewah Lake	2997	SSJD	7/24/97	-	3	8	1	10.58	23.37	9.03	37.8	0.02	*****	-	358
Benewah Lake	2997	SSJD	7/24/97	-	3	7	1.9	10.62	23.2	8.9	37.5	0.02	*****	-	361
Benewah Lake	2997	SSJD	7/24/97	-	3	6	2	10.67	23.01	8.72	37.6	0.02	*****	-	366
Benewah Lake	2997	SSJD	7/24/97	-	3	5	3	11.46	18.22	7.41	34	0.02	*****	-	407
Benewah Lake	2997	SSJD	7/24/97	-	3	4	3	11.38	18.08	7.31	33.6	0.02	*****	-	409
Benewah Lake	2997	SSJD	7/24/97	-	3	3	4	10.54	15.01	7.05	33	0.02	*****	-	421
Benewah Lake	2997	SSJD	7/24/97	-	3	2	4	9.11	14.54	6.99	34.9	0.02	88.9	-	426
Benewah Lake	2997	SSJD	7/24/97	-	3	1	4.8	5.06	13.37	6.97	40.5	0.03	48.2	-	437

Benewah Lake	3197	DBSS	8/5/97	-	2.7	5	0.3	11.3	26.45	9.38	42.4	0.03	138.4	-	259
Benewah Lake	3197	DBSS	8/5/97	-	2.7	4	1.6	11.69	24.11	9.41	42.5	0.03	137.3	-	256
Benewah Lake	3197	DBSS	8/5/97	-	2.7	3	2.8	10.7	22.54	8.41	39.8	0.03	122	-	276
Benewah Lake	3197	DBSS	8/5/97	-	2.7	2	3.6	10.2	20.44	7.28	37.3	0.02	111.7	-	309
Benewah Lake	3197	DBSS	8/5/97	-	2.7	1	4.7	2.78	15.59	7.06	47.9	0.03	27.2	-	337
Benewah Lake	3297	DBSS	8/14/97	-	4.3	9	0.4	8.91	23.87	8.9	42	0.03	104.8	-	260
Benewah Lake	3297	DBSS	8/14/97	-	4.3	8	0.9	8.91	23.86	8.9	42	0.03	104.8	-	256
Benewah Lake	3297	DBSS	8/14/97	-	4.3	7	1.4	8.89	23.86	8.91	42	0.03	104.6	-	251
Benewah Lake	3297	DBSS	8/14/97	-	4.3	6	1.9	8.89	23.76	8.83	42.1	0.03	104.4	-	250
Benewah Lake	3297	DBSS	8/14/97	-	4.3	5	2.3	8.88	23.75	8.74	42	0.03	104.3	-	248
Benewah Lake	3297	DBSS	8/14/97	-	4.3	4	2.9	7.94	22.77	8.28	41.6	0.03	91.6	-	254
Benewah Lake	3297	DBSS	8/14/97	-	4.3	3	3.4	8.65	20.97	7.3	41.2	0.03	96.3	-	277
Benewah Lake	3297	DBSS	8/14/97	-	4.3	2	3.9	8.53	20.2	7.12	41.6	0.03	93.4	-	277
Benewah Lake	3297	DBSS	8/14/97	-	4.3	1	4.4	2.15	18.22	6.93	49.6	0.03	22.7	-	293
Benewah Lake	3497	DBSS	8/27/97	-	3.8	10	0.3	9.39	22.33	8.27	46.4	0.03	107.6	-	271
Benewah Lake	3497	DBSS	8/27/97	-	3.8	9	0.8	9.41	22.18	8.36	46.5	0.03	107.5	-	264
Benewah Lake	3497	DBSS	8/27/97	-	3.8	8	1.3	9.42	22.08	8.35	46.6	0.03	107.3	-	263
Benewah Lake	3497	DBSS	8/27/97	-	3.8	7	1.8	9.46	21.85	8.37	46.6	0.03	107.3	-	260
Benewah Lake	3497	DBSS	8/27/97	-	3.8	6	2.3	9.64	21.58	8.49	46.6	0.03	108.8	-	253
Benewah Lake	3497	DBSS	8/27/97	-	3.8	5	2.8	9.6	21.49	8.45	46.6	0.03	108.1	-	250
Benewah Lake	3497	DBSS	8/27/97	-	3.8	4	3.3	9.59	21.44	8.39	46.7	0.03	108	-	248
Benewah Lake	3497	DBSS	8/27/97	-	3.8	3	3.7	9.2	21.32	8.03	46.6	0.03	103.3	-	248
Benewah Lake	3497	DBSS	8/27/97	-	3.8	2	4.3	3.62	19.73	6.74	54.2	0.03	39.4	-	292
Benewah Lake	3497	DBSS	8/27/97	-	3.8	1	4.8	1.44	18.97	6.69	57.1	0.04	15.5	-	280
Benewah Lake	3797	DBAS	9/16/97	-	1.5	10	0.2	8.58	17.07	7.22	46.1	0.03	88.5	-	308
Benewah Lake	3797	DBAS	9/16/97	-	1.5	9	0.5	8.57	17.07	7.22	46	0.03	88.6	-	308
Benewah Lake	3797	DBAS	9/16/97	-	1.5	8	1	8.56	17.05	7.22	46.1	0.03	88.4	-	307
Benewah Lake	3797	DBAS	9/16/97	-	1.5	7	1.5	8.53	17.07	7.23	46	0.03	88.3	-	306

Benewah Lake	3797	DBAS	9/16/97	-	1.5	6	2	8.57	17.07	7.23	46	0.03	88.6	-	304
Benewah Lake	3797	DBAS	9/16/97	-	1.5	5	2.5	8.64	17.05	7.23	46.1	0.03	89.3	-	302
Benewah Lake	3797	DBAS	9/16/97	-	1.5	4	3	8.7	17.05	7.23	46	0.03	90	-	300
Benewah Lake	3797	DBAS	9/16/97	-	1.5	3	3.5	8.73	17.03	7.23	46.1	0.03	90.2	-	297
Benewah Lake	3797	DBAS	9/16/97	-	1.5	2	4	8.71	17.03	7.24	46	0.03	90	-	296
Benewah Lake	3797	DBAS	9/16/97	-	1.5	1	4.5	8.73	17.03	7.23	46	0.03	90.2	-	300
Benewah Lake	3997	ASRA	9/29/97	-	2.2	8	0.3	9.77	16.41	7.41	45.9	0.03	100.9	-	382
Benewah Lake	3997	ASRA	9/29/97	-	2.2	7	1	9.9	15.76	7.41	46	0.03	100.8	-	382
Benewah Lake	3997	ASRA	9/29/97	-	2.2	6	1.5	9.87	15.4	7.39	45.8	0.03	99.8	-	383
Benewah Lake	3997	ASRA	9/29/97	-	2.2	5	2	9.78	15.3	7.37	45.8	0.03	98.7	-	383
Benewah Lake	3997	ASRA	9/29/97	-	2.2	4	2.5	9.49	15.19	7.33	45.8	0.03	95.5	-	385
Benewah Lake	3997	ASRA	9/29/97	-	2.2	3	3	9.42	15.1	7.32	45.8	0.03	94.6	-	384
Benewah Lake	3997	ASRA	9/29/97	-	2.2	2	3.5	9.16	15.04	7.3	45.8	0.03	91.9	-	385
Benewah Lake	3997	ASRA	9/29/97	-	2.2	1	4	9.09	15.04	7.31	45.9	0.03	91.2	-	384
Benewah Lake	4297	DBAS	10/20/97	-	2.2	9	0.3	10.61	10.45	7.15	49.1	0.03	94	-	369
Benewah Lake	4297	DBAS	10/20/97	-	2.2	8	0.6	10.61	10.48	7.12	49.3	0.03	94	-	372
Benewah Lake	4297	DBAS	10/20/97	-	2.2	7	1.1	10.63	10.48	7.11	49.3	0.03	94.2	-	372
Benewah Lake	4297	DBAS	10/20/97	-	2.2	6	1.6	10.63	10.43	7.11	49.4	0.03	94.1	-	372
Benewah Lake	4297	DBAS	10/20/97	-	2.2	5	2.1	10.6	10.45	7.08	49.3	0.03	93.8	-	372
Benewah Lake	4297	DBAS	10/20/97	-	2.2	4	2.6	10.55	10.41	7.04	49.3	0.03	93.3	-	373
Benewah Lake	4297	DBAS	10/20/97	-	2.2	3	3.1	10.17	10.41	7.02	49.5	0.03	90	-	373
Benewah Lake	4297	DBAS	10/20/97	-	2.2	2	3.6	9.84	10.4	6.97	49.8	0.03	87	-	375
Benewah Lake	4297	DBAS	10/20/97	-	2.2	1	4.1	9.71	10.38	6.86	49.8	0.03	85.8	-	378

Location	Phase	Sampler	Date	Time	Secchi	Sequence	Depth (m)	Dissolved Oxygen (mg/l)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Percent Saturation	Statime	Redox
ST.JOE	1597	AS SS	4/18/97	-	1.1	2	0.2	12.89		7.41	32.4	0.02	102.6	-	-
ST.JOE	1597	AS SS	4/18/97	-	1.1	1	5	13.21	5.54	7.41	32.3	0.02	*****	-	356

ST.JOE	1997	DB SS	5/16/97	-	0.4	12	0.2	11.4	8.54	6.99	25.9	0.02	96.7	-	356
ST.JOE	1997	DB SS	5/16/97	-	0.4	11	1	11.41	8.46	6.96	25.9	0.02	96.6	-	364
ST.JOE	1997	DB SS	5/16/97	-	0.4	10	1.9	11.44	8.36	6.97	25.9	0.02	96.6	-	365
ST.JOE	1997	DB SS	5/16/97	-	0.4	9	3	11.44	8.36	6.96	25.9	0.02	96.4	-	365
ST.JOE	1997	DB SS	5/16/97	-	0.4	8	4.1	11.44	8.36	6.96	25.9	0.02	96.5	-	366
ST.JOE	1997	DB SS	5/16/97	-	0.4	7	5	11.44	8.35	6.95	25.9	0.02	96.6	-	367
ST.JOE	1997	DB SS	5/16/97	-	0.4	6	6	11.46	8.35	6.96	26	0.02	96.7	-	367
ST.JOE	1997	DB SS	5/16/97	-	0.4	5	6.9	11.43	8.38	6.96	25.9	0.02	96.5	-	368
ST.JOE	1997	DB SS	5/16/97	-	0.4	4	8	11.43	8.38	6.96	26	0.02	96.6	-	369
ST.JOE	1997	DB SS	5/16/97	-	0.4	3	9.2	11.39	8.4	6.97	26	0.02	96.3	-	369
ST.JOE	1997	DB SS	5/16/97	-	0.4	2	10	11.44	8.4	6.99	25.9	0.02	96.7	-	371
ST.JOE	1997	DB SS	5/16/97	-	0.4	1	11.2	11.45	8.4	6.99	25.9	0.02	96.8	-	373
ST.JOE	2197	DBSS	5/29/97	-	1.1	10	0.3	11.53	8.97	7.08	26.3	0.02	99.1	-	363
ST.JOE	2197	DBSS	5/29/97	-	1.1	9	0.3	11.53	8.99	7.09	26.4	0.02	99.1	-	362
ST.JOE	2197	DBSS	5/29/97	-	1.1	8	0.3	11.51	8.99	7.08	26.6	0.02	98.9	-	363
ST.JOE	2197	DBSS	5/29/97	-	1.1	7	0.3	11.53	8.97	7.09	26.1	0.02	99.1	-	363
ST.JOE	2197	DBSS	5/29/97	-	1.1	6	0.3	11.53	8.99	7.09	26.4	0.02	99.1	-	363
ST.JOE	2197	DBSS	5/29/97	-	1.1	5	9.1	11.53	8.97	7.06	26.5	0.02	98.7	-	366
ST.JOE	2197	DBSS	5/29/97	-	1.1	4	10	11.51	8.97	7.06	26.5	0.02	98.9	-	366
ST.JOE	2197	DBSS	5/29/97	-	1.1	3	10.1	11.51	8.99	7.07	26.7	0.02	98.8	-	366
ST.JOE	2197	DBSS	5/29/97	-	1.1	2	10.5	11.5	8.97	7.06	26.4	0.02	98.9	-	366
ST.JOE	2197	DBSS	5/29/97	-	1.1	1	10.6	11.49	8.97	7.06	26.6	0.02	99.1	-	366
ST.JOE	2397	DBAS	6/11/97	-	1.7	10	0.8	11.35	10.28	7.13	28.1	0.02	100.9	-	394
ST.JOE	2397	DBAS	6/11/97	-	1.7	9	0.8	11.33	10.3	7.13	28.1	0.02	100.9	-	394
ST.JOE	2397	DBAS	6/11/97	-	1.7	8	0.9	11.33	10.3	7.13	28.1	0.02	100.9	-	394
ST.JOE	2397	DBAS	6/11/97	-	1.7	7	0.9	11.33	10.3	7.13	28.1	0.02	100.9	-	394
ST.JOE	2397	DBAS	6/11/97	-	1.7	6	0.8	11.35	10.3	7.12	28.1	0.02	101	-	395
ST.JOE	2397	DBAS	6/11/97	-	1.7	5	0.9	11.35	10.3	7.13	28.1	0.02	101	-	395
ST.JOE	2397	DBAS	6/11/97	-	1.7	4	0.9	11.36	10.3	7.13	28.1	0.02	101.1	-	395
ST.JOE	2397	DBAS	6/11/97	-	1.7	3	0.9	11.37	10.28	7.13	28.1	0.02	101.1	-	395

ST.JOE	2397	DBAS	6/11/97	-	1.7	2	1.1	11.37	10.28	7.14	28.1	0.02	101.2	-	395
ST.JOE	2397	DBAS	6/11/97	-	1.7	1	0.9	11.38	10.3	7.11	28	0.02	101.3	-	398
ST.JOE	2597	DBSS	6/26/97	-	3.1	11	0.2	11.21	10.68	7.18	32.1	0.02	100.6	-	399
ST.JOE	2597	DBSS	6/26/97	-	3.1	10	1	11.17	10.66	7.17	32.1	0.02	100.1	-	400
ST.JOE	2597	DBSS	6/26/97	-	3.1	9	1.9	11.2	10.64	7.17	32.1	0.02	100.4	-	402
ST.JOE	2597	DBSS	6/26/97	-	3.1	8	2.9	11.17	10.64	7.17	32.1	0.02	100.2	-	402
ST.JOE	2597	DBSS	6/26/97	-	3.1	7	4	11.19	10.64	7.17	32	0.02	100.3	-	402
ST.JOE	2597	DBSS	6/26/97	-	3.1	6	4.9	11.17	10.64	7.17	32.1	0.02	100.2	-	402
ST.JOE	2597	DBSS	6/26/97	-	3.1	5	6.1	11.19	10.64	7.17	32	0.02	100.3	-	402
ST.JOE	2597	DBSS	6/26/97	-	3.1	4	7.1	11.18	10.61	7.18	32	0.02	100.1	-	401
ST.JOE	2597	DBSS	6/26/97	-	3.1	3	8.1	11.18	10.62	7.17	32.1	0.02	100	-	401
ST.JOE	2597	DBSS	6/26/97	-	3.1	2	9	11.18	10.62	7.18	32	0.02	100.2	-	400
ST.JOE	2597	DBSS	6/26/97	-	3.1	1	11.2	11.2	10.67	7.19	32	0.02	100.4	-	400
ST.JOE	2797	DBSS	7/8/97	-	2.5	13	0.4	9.9	15.06	7.14	34.6	0.02	97.6	-	414
ST.JOE	2797	DBSS	7/8/97	-	2.5	12	1.3	9.89	15.04	7.16	34.6	0.02	97.5	-	414
ST.JOE	2797	DBSS	7/8/97	-	2.5	11	2.4	9.9	15.07	7.15	34.6	0.02	97.6	-	415
ST.JOE	2797	DBSS	7/8/97	-	2.5	10	3.5	9.92	15.02	7.15	34.6	0.02	97.7	-	415
ST.JOE	2797	DBSS	7/8/97	-	2.5	9	4.4	9.9	15.09	7.15	34.6	0.02	97.8	-	415
ST.JOE	2797	DBSS	7/8/97	-	2.5	8	5.4	9.9	15.06	7.15	34.6	0.02	97.7	-	416
ST.JOE	2797	DBSS	7/8/97	-	2.5	7	6.4	9.89	15.02	7.15	34.6	0.02	97.5	-	416
ST.JOE	2797	DBSS	7/8/97	-	2.5	6	7.4	9.88	15.02	7.16	34.6	0.02	97.4	-	416
ST.JOE	2797	DBSS	7/8/97	-	2.5	5	8.3	9.9	15.02	7.16	34.6	0.02	97.6	-	416
ST.JOE	2797	DBSS	7/8/97	-	2.5	4	9.4	9.89	15.06	7.16	34.6	0.02	97.5	-	416
ST.JOE	2797	DBSS	7/8/97	-	2.5	3	10.4	9.91	15.06	7.18	34.6	0.02	97.7	-	416
ST.JOE	2797	DBSS	7/8/97	-	2.5	2	11.4	9.93	15.06	7.19	34.6	0.02	98	-	416
ST.JOE	2797	DBSS	7/8/97	-	2.5	1	12.3	10.07	15.07	7.22	34.6	0.02	99.3	-	416
ST.JOE	2997	SSJD	7/24/97	-	3	11	0.3	9.37	18.94	7.2	38.3	0.02	*****	-	430
ST.JOE	2997	SSJD	7/24/97	-	3	10	1.3	9.42	18.47	7.2	38.2	0.02	99.9	-	431
ST.JOE	2997	SSJD	7/24/97	-	3	9	2.3	9.4	18.22	7.21	38.1	0.02	99.2	-	432

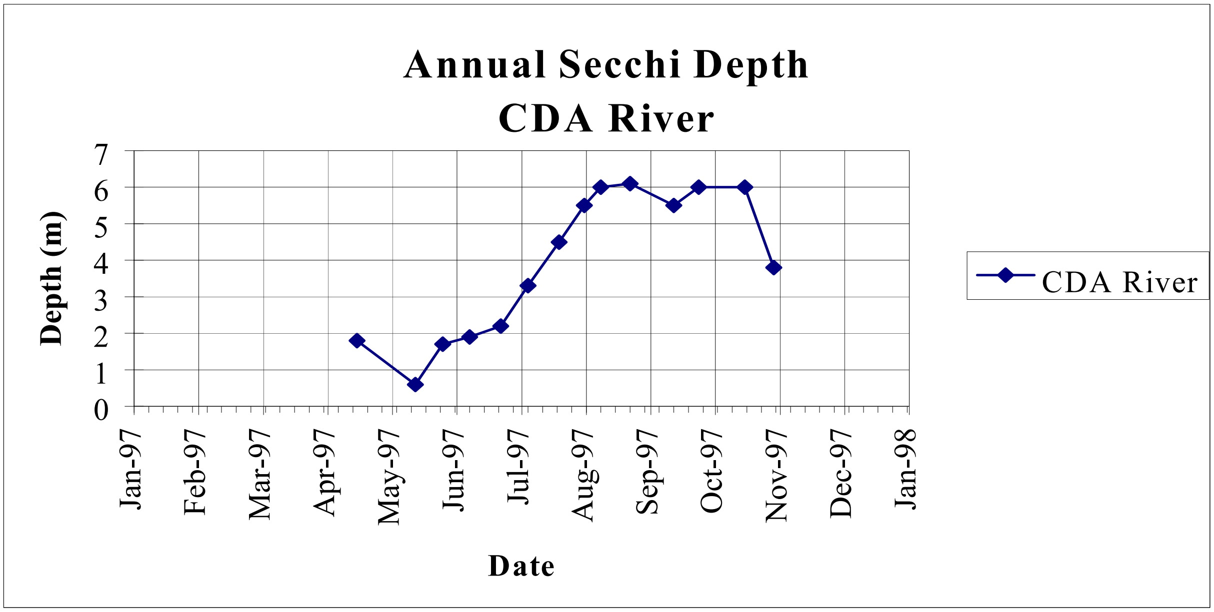
ST.JOE	2997	SSJD	7/24/97	-	3	8	3.3	9.42	18.15	7.21	38.2	0.02	99.2	-	432
ST.JOE	2997	SSJD	7/24/97	-	3	7	4.3	9.43	18.22	7.21	38.2	0.02	99.5	-	433
ST.JOE	2997	SSJD	7/24/97	-	3	6	5.3	9.41	18.22	7.2	38.1	0.02	99.3	-	434
ST.JOE	2997	SSJD	7/24/97	-	3	5	6.3	9.4	18.1	7.21	38.1	0.02	99	-	433
ST.JOE	2997	SSJD	7/24/97	-	3	4	7.3	9.41	18.22	7.21	38.1	0.02	99.3	-	434
ST.JOE	2997	SSJD	7/24/97	-	3	3	8.3	9.4	18.18	7.22	38.1	0.02	99.1	-	434
ST.JOE	2997	SSJD	7/24/97	-	3	2	9.3	9.43	18.1	7.25	38.1	0.02	99.3	-	434
ST.JOE	2997	SSJD	7/24/97	-	3	1	10.3	9.47	18.08	7.29	38.1	0.02	99.7	-	434
ST.JOE	3197	DBSS	8/5/97	-	3	13	0.3	9.07	23.01	7.3	44.8	0.03	104.4	-	351
ST.JOE	3197	DBSS	8/5/97	-	3	12	1.5	9.11	21.37	7.26	44.5	0.03	101.5	-	354
ST.JOE	3197	DBSS	8/5/97	-	3	11	2.4	9	21.28	7.25	44.7	0.03	100.2	-	355
ST.JOE	3197	DBSS	8/5/97	-	3	10	3.4	8.91	20.55	7.22	44.3	0.03	97.8	-	356
ST.JOE	3197	DBSS	8/5/97	-	3	9	4.5	8.64	19.94	7.19	44	0.03	93.7	-	357
ST.JOE	3197	DBSS	8/5/97	-	3	8	5.5	8.62	19.71	7.19	44.1	0.03	93.1	-	356
ST.JOE	3197	DBSS	8/5/97	-	3	7	6.5	8.54	19.57	7.19	43.7	0.03	92	-	356
ST.JOE	3197	DBSS	8/5/97	-	3	6	7.5	8.51	19.45	7.19	43.7	0.03	91.3	-	356
ST.JOE	3197	DBSS	8/5/97	-	3	5	8.5	8.46	19.33	7.19	43.8	0.03	90.6	-	356
ST.JOE	3197	DBSS	8/5/97	-	3	4	9.5	8.44	19.26	7.19	43.6	0.03	90.3	-	356
ST.JOE	3197	DBSS	8/5/97	-	3	3	10.5	8.43	19.25	7.19	43.7	0.03	90.2	-	356
ST.JOE	3197	DBSS	8/5/97	-	3	2	11.5	8.4	19.25	7.19	43.7	0.03	89.8	-	355
ST.JOE	3197	DBSS	8/5/97	-	3	1	12.1	8.4	19.3	7.2	43.6	0.03	89.9	-	354
ST.JOE	3497	DBSS	8/27/97	-	4	14	0.2	8.47	20.77	7.23	55.6	0.04	94.3	-	317
ST.JOE	3497	DBSS	8/27/97	-	4	13	0.8	8.49	20.27	7.25	55.8	0.04	93.4	-	316
ST.JOE	3497	DBSS	8/27/97	-	4	12	1.7	8.47	20.2	7.24	55.7	0.04	93.1	-	317
ST.JOE	3497	DBSS	8/27/97	-	4	11	2.7	8.49	20.2	7.25	55.6	0.04	93.2	-	316
ST.JOE	3497	DBSS	8/27/97	-	4	10	3.7	8.49	20.2	7.24	55.7	0.04	93.3	-	316
ST.JOE	3497	DBSS	8/27/97	-	4	9	4.6	8.48	20.15	7.24	55.6	0.04	93	-	316
ST.JOE	3497	DBSS	8/27/97	-	4	8	5.6	8.46	20.09	7.24	55.6	0.04	92.9	-	316
ST.JOE	3497	DBSS	8/27/97	-	4	7	6.4	8.41	20.08	7.23	55.5	0.04	92.3	-	316
ST.JOE	3497	DBSS	8/27/97	-	4	6	7.5	8.4	20.02	7.23	55.6	0.04	92	-	316

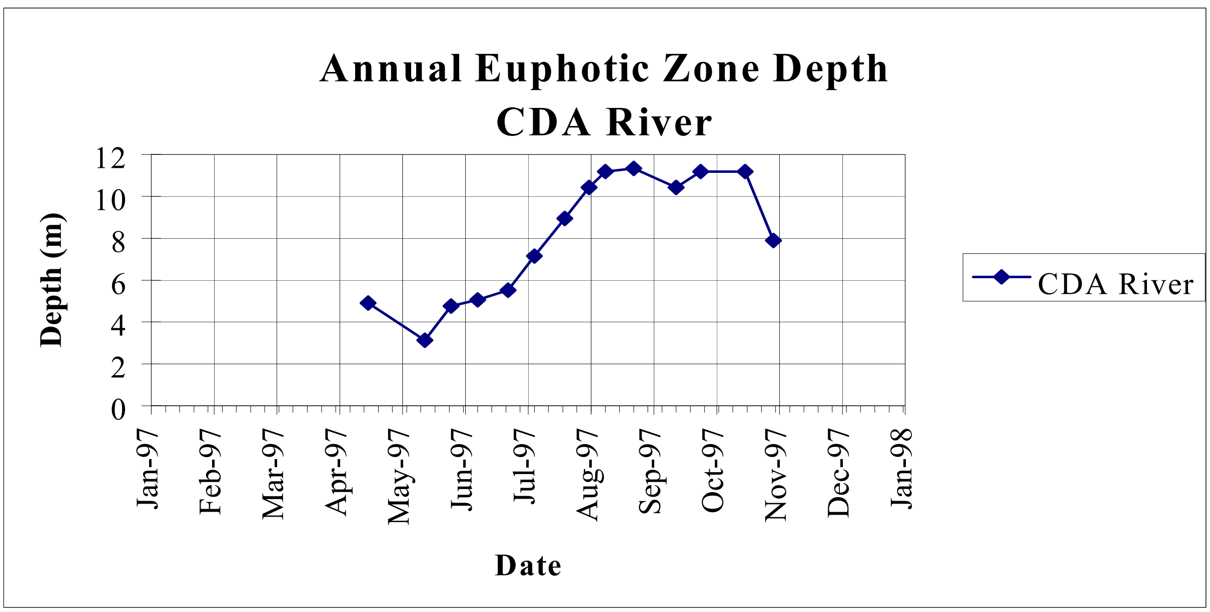
ST.JOE	3497	DBSS	8/27/97	-	4	5	8.5	8.39	20.02	7.24	55.5	0.04	91.9	-	315
ST.JOE	3497	DBSS	8/27/97	-	4	4	9.6	8.38	20.01	7.24	55.6	0.04	91.7	-	315
ST.JOE	3497	DBSS	8/27/97	-	4	3	10.4	8.38	20.01	7.25	55.5	0.04	91.7	-	314
ST.JOE	3497	DBSS	8/27/97	-	4	2	11.5	8.41	20.01	7.26	55.7	0.04	92	-	313
ST.JOE	3497	DBSS	8/27/97	-	4	1	12.7	8.43	20.04	7.27	55.6	0.04	92.3	-	313
ST.JOE	3797	DBAS	9/16/97	-	3.5	13	0.2	8.51	17.45	7.2	54.9	0.04	88.7	-	308
ST.JOE	3797	DBAS	9/16/97	-	3.5	12	0.9	8.48	17.51	7.21	55.2	0.04	88.5	-	307
ST.JOE	3797	DBAS	9/16/97	-	3.5	11	1.9	8.47	17.47	7.2	55.1	0.04	88.3	-	308
ST.JOE	3797	DBAS	9/16/97	-	3.5	10	2.9	8.47	17.45	7.19	55.2	0.04	88.3	-	307
ST.JOE	3797	DBAS	9/16/97	-	3.5	9	3.9	8.48	17.44	7.21	55.1	0.04	88.3	-	305
ST.JOE	3797	DBAS	9/16/97	-	3.5	8	4.9	8.49	17.43	7.2	55.1	0.04	88.5	-	305
ST.JOE	3797	DBAS	9/16/97	-	3.5	7	5.9	8.51	17.44	7.2	55.3	0.04	88.6	-	305
ST.JOE	3797	DBAS	9/16/97	-	3.5	6	6.9	8.49	17.42	7.2	55.2	0.04	88.6	-	303
ST.JOE	3797	DBAS	9/16/97	-	3.5	5	7.9	8.48	17.42	7.21	55.2	0.04	88.3	-	303
ST.JOE	3797	DBAS	9/16/97	-	3.5	4	8.9	8.51	17.42	7.21	55.3	0.04	88.6	-	302
ST.JOE	3797	DBAS	9/16/97	-	3.5	3	9.9	8.51	17.42	7.21	55.2	0.04	88.6	-	301
ST.JOE	3797	DBAS	9/16/97	-	3.5	2	10.9	8.53	17.44	7.22	55.2	0.04	88.8	-	300
ST.JOE	3797	DBAS	9/16/97	-	3.5	1	11.9	8.54	17.41	7.23	55.2	0.04	89	-	299
ST.JOE	3997	ASRA	9/29/97	-	2.7	11	0.2	9.83	16.29	7.24	52.9	0.03	101.3	-	397
ST.JOE	3997	ASRA	9/29/97	-	2.7	10	1.6	9.77	14.01	7.22	52.5	0.03	95.8	-	400
ST.JOE	3997	ASRA	9/29/97	-	2.7	9	2.6	9.71	13.91	7.22	52.4	0.03	95	-	400
ST.JOE	3997	ASRA	9/29/97	-	2.7	8	3.6	9.72	13.88	7.23	52.5	0.03	95.1	-	400
ST.JOE	3997	ASRA	9/29/97	-	2.7	7	4.6	9.66	13.86	7.23	52.4	0.03	94.4	-	399
ST.JOE	3997	ASRA	9/29/97	-	2.7	6	5.6	9.47	13.86	7.24	52.5	0.03	92.6	-	399
ST.JOE	3997	ASRA	9/29/97	-	2.7	5	6.6	9.44	13.86	7.25	52.3	0.03	92.3	-	399
ST.JOE	3997	ASRA	9/29/97	-	2.7	4	7.6	9.46	13.83	7.25	52.3	0.03	92.3	-	398
ST.JOE	3997	ASRA	9/29/97	-	2.7	3	8.6	9.43	13.88	7.27	52.2	0.03	92.1	-	398
ST.JOE	3997	ASRA	9/29/97	-	2.7	2	9.6	9.55	13.83	7.27	52.3	0.03	93.3	-	398
ST.JOE	3997	ASRA	9/29/97	-	2.7	1	10.6	9.5	13.83	7.29	52.3	0.03	92.7	-	397

ST.JOE	4297	DBAS	10/20/97	-	2.1	11	0.3	10.77	9.06	6.97	56.7	0.04	92.3	-	399
ST.JOE	4297	DBAS	10/20/97	-	2.1	10	1.3	10.75	9.07	6.95	56.7	0.04	92.1	-	402
ST.JOE	4297	DBAS	10/20/97	-	2.1	9	2.3	10.76	9.06	6.93	56.7	0.04	92.1	-	403
ST.JOE	4297	DBAS	10/20/97	-	2.1	8	3.3	10.76	9.06	6.91	56.7	0.04	92.1	-	404
ST.JOE	4297	DBAS	10/20/97	-	2.1	7	4.3	10.74	9.06	6.91	56.6	0.04	92	-	405
ST.JOE	4297	DBAS	10/20/97	-	2.1	6	5.3	10.76	9.06	6.88	56.6	0.04	92.1	-	406
ST.JOE	4297	DBAS	10/20/97	-	2.1	5	6.3	10.76	9.04	6.87	56.7	0.04	92.2	-	406
ST.JOE	4297	DBAS	10/20/97	-	2.1	4	7.3	10.78	9.02	6.85	56.6	0.04	92.3	-	407
ST.JOE	4297	DBAS	10/20/97	-	2.1	3	8.3	10.78	9.04	6.83	56.6	0.04	92.3	-	408
ST.JOE	4297	DBAS	10/20/97	-	2.1	2	9.3	10.8	9.02	6.81	56.5	0.04	92.4	-	408
ST.JOE	4297	DBAS	10/20/97	-	2.1	1	10.3	10.83	9.04	6.76	56.7	0.04	92.8	-	411
ST.JOE	4497	DB AS	11/3/97	-	1	11	0.4	11.9	7.03	6.63	39.7	0.03	96.8	*****	436
ST.JOE	4497	DB AS	11/3/97	-	1	10	1.8	11.93	7.02	6.61	39.9	0.03	96.9	*****	438
ST.JOE	4497	DB AS	11/3/97	-	1	9	2.8	11.9	7.03	6.63	39.8	0.03	96.8	*****	438
ST.JOE	4497	DB AS	11/3/97	-	1	8	3.8	11.92	7.03	6.61	39.8	0.03	96.9	*****	438
ST.JOE	4497	DB AS	11/3/97	-	1	7	4.8	11.89	7.04	6.61	39.9	0.03	96.6	*****	437
ST.JOE	4497	DB AS	11/3/97	-	1	6	5.8	11.93	7.06	6.61	39.8	0.03	96.9	*****	436
ST.JOE	4497	DB AS	11/3/97	-	1	5	6.8	11.93	7.06	6.61	39.9	0.03	96.9	*****	436
ST.JOE	4497	DB AS	11/3/97	-	1	4	7.8	11.95	7.07	6.61	40.2	0.03	97.1	*****	438
ST.JOE	4497	DB AS	11/3/97	-	1	3	8.8	11.96	7.08	6.61	39.9	0.03	97.3	*****	438
ST.JOE	4497	DB AS	11/3/97	-	1	2	9.8	12	7.08	6.61	39.9	0.03	97.6	*****	438
ST.JOE	4497	DB AS	11/3/97	-	1	1	10.7	11.99	7.09	6.63	39.9	0.03	97.5	*****	441

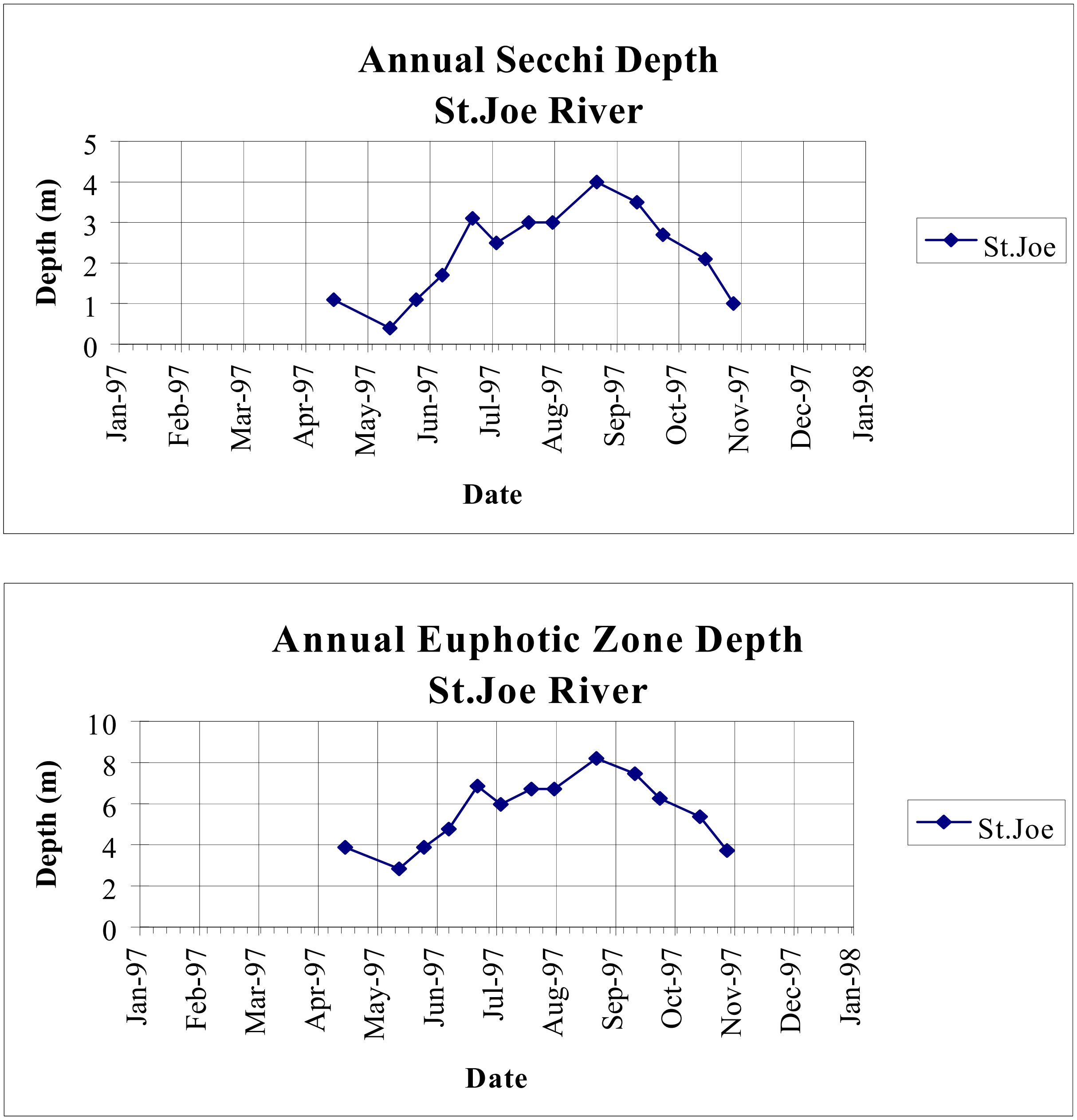
Appendix B

Secchi readings and empirically derived estimates of euphotic zone depth for thirteen stations in Coeur d'Alene Lake, 1997.

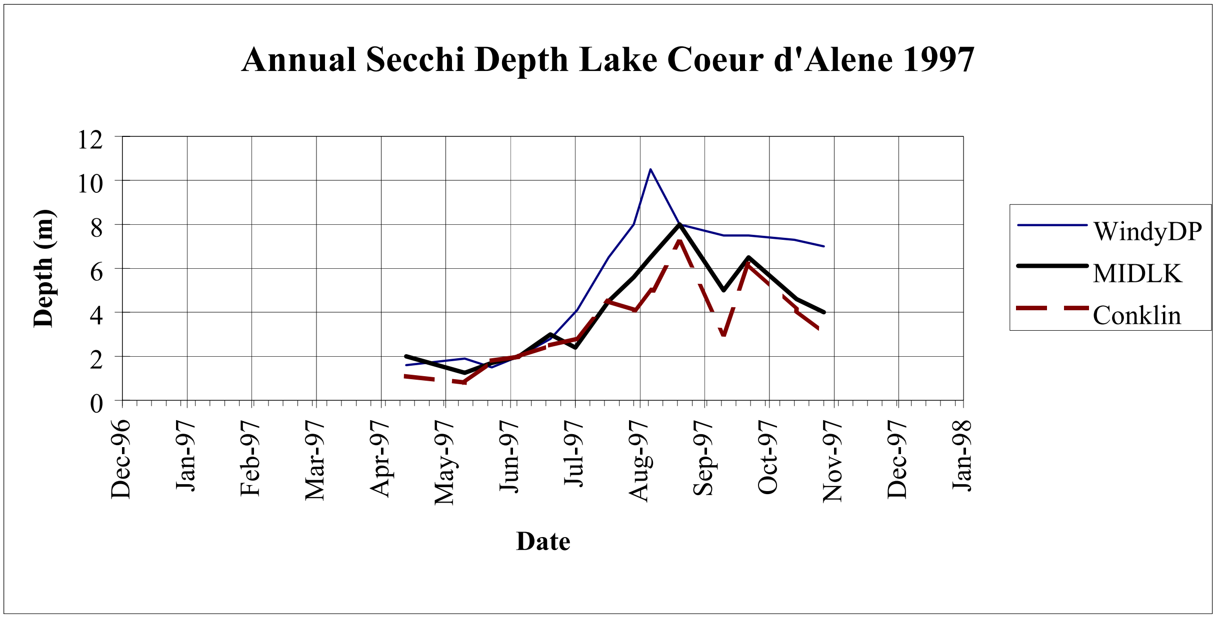


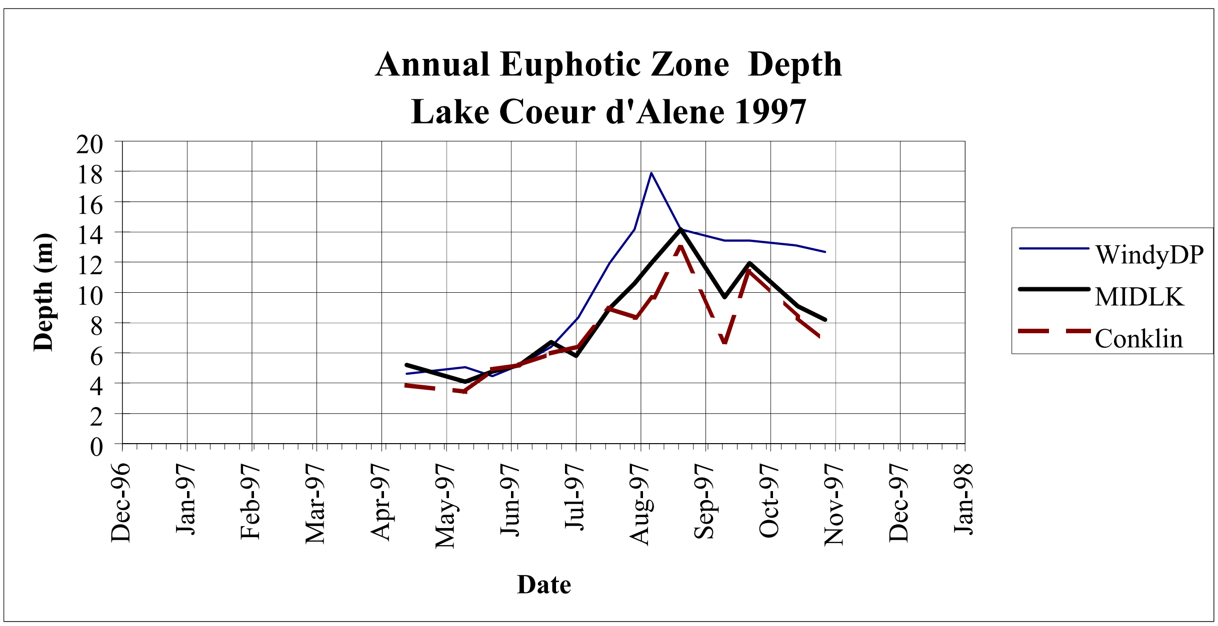


(a) Annual secchi readings (SD) for the mouth of the Coeur d'Alene River, 1997. **(b)** Empirically derived estimate of euphotic zone depth (EZD). Values are calculated using the following regression equation published by Alaska Department of Fish and Game (1987): $EZD=2.2303 + 1.4914SD$ ($r^2 = .78$)

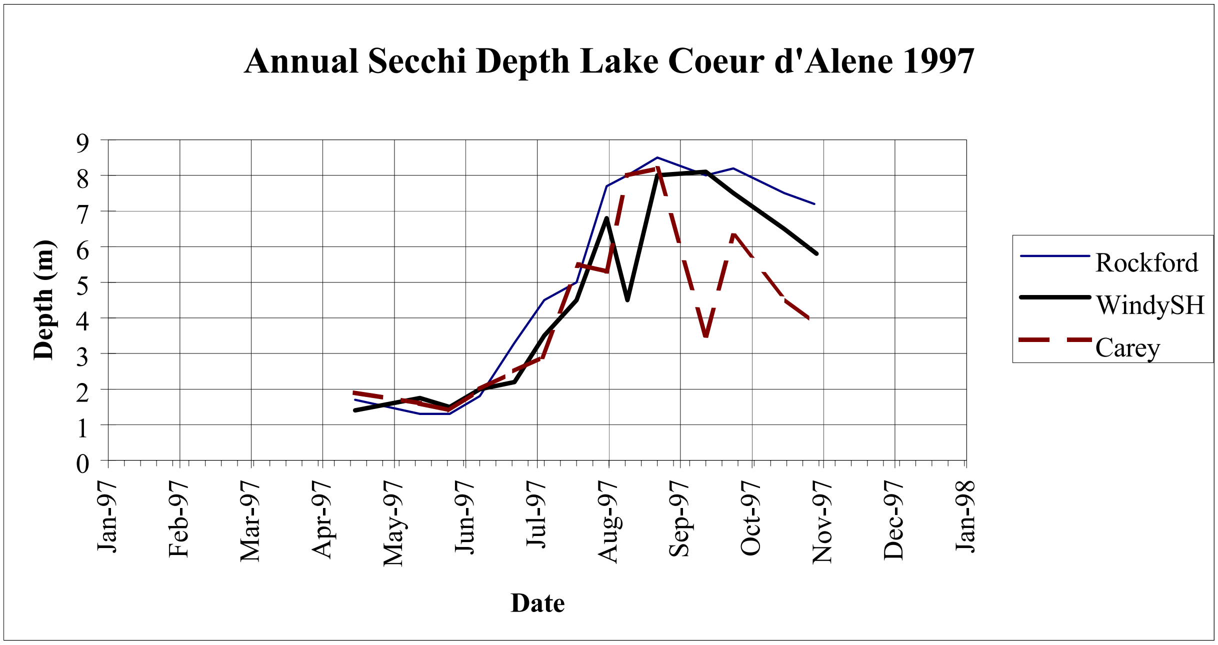


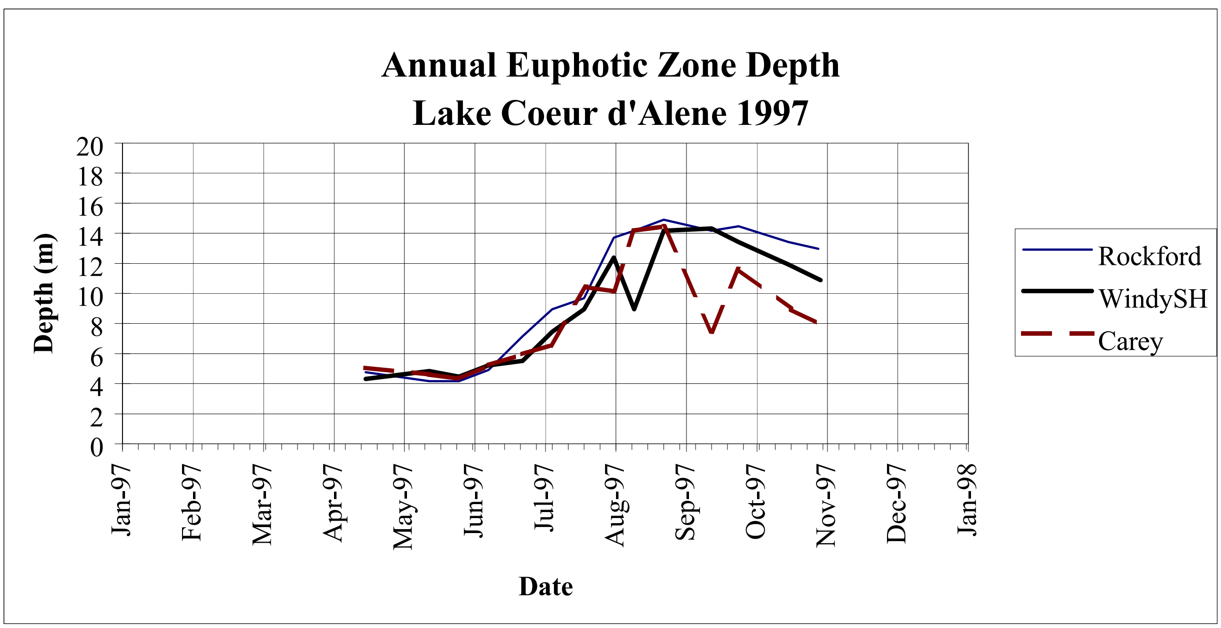
(a) Annual secchi readings (SD) for the mouth of the St. Joe River, 1997. **(b)** Empirically derived estimate of euphotic zone depth (EZD). Values are calculated using the following regression equation published by Alaska Department of Fish and Game (1987): EZD=2.2303 + 1.4914SD (r^2 = .78)



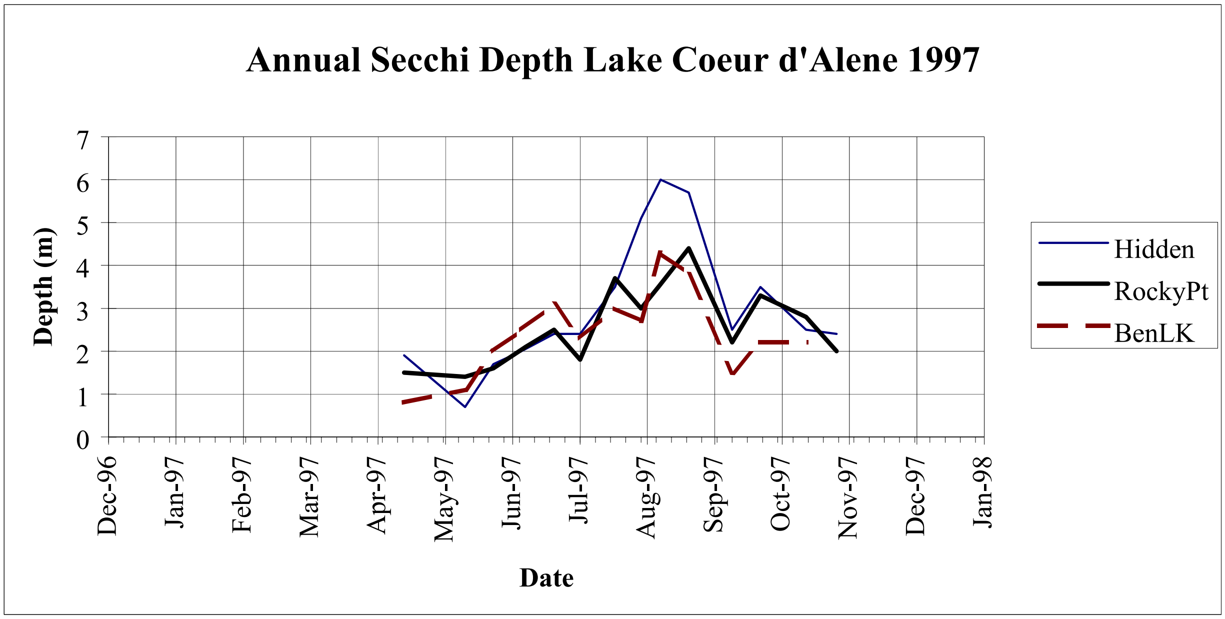


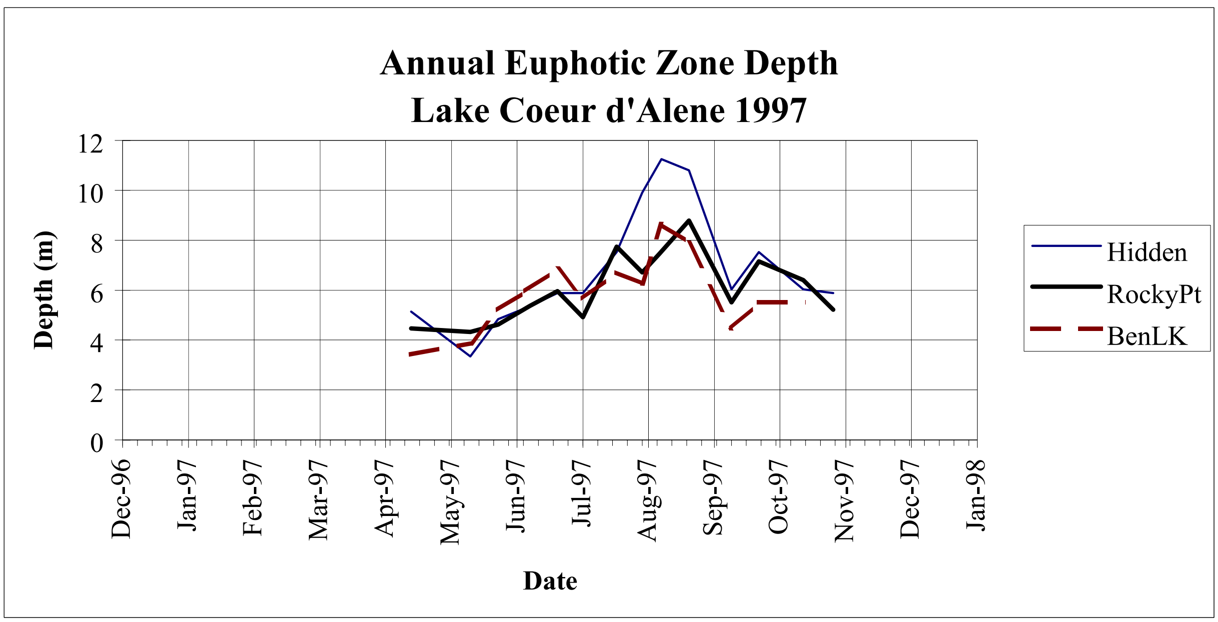
(a) Annual secchi readings (SD) for three geomorphically similar sampling locations on Coeur d'Alene Lake, 1997. **(b)** Empirically derived estimate of euphotic zone depth (EZD). Values are calculated using the following regression equation published by Alaska Department of Fish and Game (1987): $EZD=2.2303 + 1.4914SD$ ($r^2 = .78$)



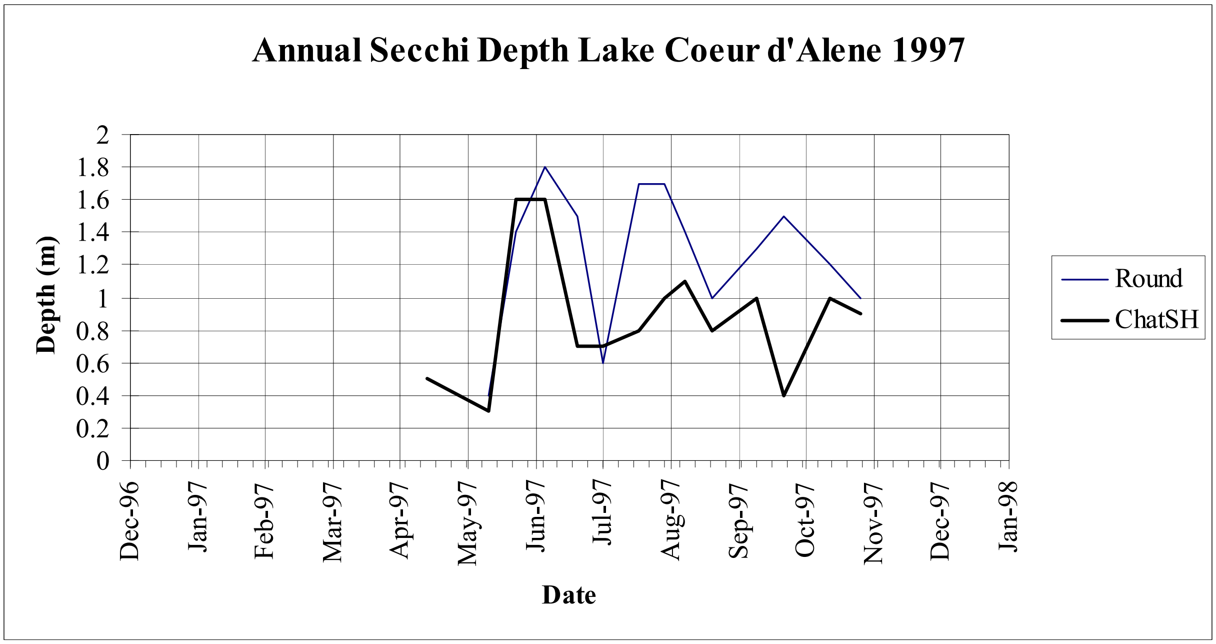


(a) Annual secchi readings (SD) for three geomorphically similar sampling locations on Coeur d'Alene Lake, 1997. **(b)** Empirically derived estimate of euphotic zone depth (EZD). Values are calculated using the following regression equation published by Alaska Department of Fish and Game (1987): EZD=2.2303 + 1.4914SD (r^2 = .78)





(a) Annual secchi readings (SD) for three geomorphically similar sampling locations on Coeur d'Alene Lake, 1997. **(b)** Empirically derived estimate of euphotic zone depth (EZD). Values are calculated using the following regression equation published by Alaska Department of Fish and Game (1987): EZD=2.2303 + 1.4914SD (r^2 = .78)



(a) Annual secchi readings (SD) for two geomorphically similar sampling locations on Coeur d'Alene Lake, 1997. Due to the shallowness of these lakes, the euphotic zone depth is encompasses the entire water column.

Appendix C

Cohort analysis of growth for cutthroat trout and brook trout, 1996-1997.

Mean back-calculated lengths at annulus formation by age class and cohort - 1996

SPECIES

Cutthroat Trout **Age Class**

LOCATION	Cohort	Number	1	2	3	4	5	6	7	8
ALDER	1995	1	81	#####	#####	#####	#####	#####	#####	#####
	1994	31	84	120	#####	#####	#####	#####	#####	#####
	1993	20	81	116	147	#####	#####	#####	#####	#####
	1992	2	90	119	160	192	#####	#####	#####	#####
ALDER Total		54	83	118	148	192	#####	#####	#####	#####
BENEWAH	1996	6	#####	#####	#####	#####	#####	#####	#####	#####
	1995	28	85	#####	#####	#####	#####	#####	#####	#####
	1994	153	83	120	#####	#####	#####	#####	#####	#####
	1993	38	83	123	155	#####	#####	#####	#####	#####
	1992	7	88	131	167	206	#####	#####	#####	#####
	1991	1	78	115	152	199	236	#####	#####	#####
	1990	2	91	136	181	222	269	316	#####	#####
	1989	1	84	117	151	191	224	265	318	#####
BENEWAH Total		236	83	121	158	207	250	299	318	#####
CHERRY	1994	1	83	133	#####	#####	#####	#####	#####	#####
	1993	1	89	137	168	#####	#####	#####	#####	#####
	1990	6	87	135	177	214	256	298	#####	#####
CHERRY Total		8	86	135	176	214	256	298	#####	#####
EVANS	1996	7	#####	#####	#####	#####	#####	#####	#####	#####
	1995	35	84	#####	#####	#####	#####	#####	#####	#####
	1994	54	84	121	#####	#####	#####	#####	#####	#####
	1993	31	84	129	162	#####	#####	#####	#####	#####
	1992	6	86	131	169	207	#####	#####	#####	#####
EVANS Total		133	84	124	163	207	#####	#####	#####	#####
LAKE	1996	59	#####	#####	#####	#####	#####	#####	#####	#####
	1995	54	79	#####	#####	#####	#####	#####	#####	#####
	1994	72	86	127	#####	#####	#####	#####	#####	#####
	1993	30	85	131	161	#####	#####	#####	#####	#####
	1992	6	88	134	173	211	#####	#####	#####	#####
	1990	21	94	142	184	228	269	314	#####	#####
	1989	6	91	132	172	216	251	291	336	#####
	1988	1	88	133	170	201	246	283	328	366
LAKE Total		249	85	131	171	222	264	308	335	366
Grand Total		680	84	124	163	216	261	306	333	366

Standard deviation of mean back-calculated lengths at annulus formation - 1996

SPECIES

Cutthroat Trout **Age Class**

LOCATION	Cohort	Number	1	2	3	4	5	6	7	8
ALDER	1995	1	#####	#####	#####	#####	#####	#####	#####	#####
	1994	31	3	6	#####	#####	#####	#####	#####	#####
	1993	20	4	7	9	#####	#####	#####	#####	#####
	1992	2	1	2	11	9	#####	#####	#####	#####
ALDER Total		54	4	7	10	9	#####	#####	#####	#####
BENEWAH	1996	6	#####	#####	#####	#####	#####	#####	#####	#####
	1995	28	6	#####	#####	#####	#####	#####	#####	#####
	1994	153	6	10	#####	#####	#####	#####	#####	#####
	1993	38	5	8	19	#####	#####	#####	#####	#####
	1992	7	4	6	6	7	#####	#####	#####	#####
	1991	1	#####	#####	#####	#####	#####	#####	#####	#####
	1990	2	8	10	25	32	18	4	#####	#####
	1989	1	#####	#####	#####	#####	#####	#####	#####	#####
BENEWAH Total		236	6	10	19	15	25	30	#####	#####
CHERRY	1994	1	#####	#####	#####	#####	#####	#####	#####	#####
	1993	1	#####	#####	#####	#####	#####	#####	#####	#####
	1990	6	4	7	12	15	21	22	#####	#####
CHERRY Total		8	4	6	12	15	21	22	#####	#####
EVANS	1996	7	#####	#####	#####	#####	#####	#####	#####	#####
	1995	35	6	#####	#####	#####	#####	#####	#####	#####
	1994	54	8	20	#####	#####	#####	#####	#####	#####
	1993	31	6	8	23	#####	#####	#####	#####	#####
	1992	6	5	5	5	4	#####	#####	#####	#####
EVANS Total		133	7	16	21	4	#####	#####	#####	#####
LAKE	1996	59	#####	#####	#####	#####	#####	#####	#####	#####
	1995	54	7	#####	#####	#####	#####	#####	#####	#####
	1994	72	5	9	#####	#####	#####	#####	#####	#####
	1993	30	5	9	23	#####	#####	#####	#####	#####
	1992	6	8	10	13	17	#####	#####	#####	#####
	1990	21	3	7	8	9	11	11	#####	#####
	1989	6	4	5	11	10	13	13	17	#####
	1988	1	#####	#####	#####	#####	#####	#####	#####	#####
LAKE Total		249	7	10	20	13	14	15	16	#####
Grand Total		680	6	12	20	15	17	18	16	#####

Mean back-calculated lengths at annulus formation by age class and cohort - 1996

SPECIES

Brook Trout

LOCATION	Cohort	Number	1	2	3	4	5	6	7	8
ALDER	1996	19	#####	#####	#####	#####	#####	#####	#####	#####
	1995	3	84	#####	#####	#####	#####	#####	#####	#####
	1994	28	83	116	#####	#####	#####	#####	#####	#####
	1993	34	85	121	152	#####	#####	#####	#####	#####
	1992	21	85	126	150	200	#####	#####	#####	#####
	1991	8	81	118	150	192	227	#####	#####	#####
ALDER Total		113	84	120	151	198	227	#####	#####	#####
BENEWAH	1996	4	#####	#####	#####	#####	#####	#####	#####	#####
	1995	4	76	#####	#####	#####	#####	#####	#####	#####
	1993	4	112	119	161	#####	#####	#####	#####	#####
	1992	8	83	126	162	211	#####	#####	#####	#####
	1991	6	87	134	176	220	268	#####	#####	#####
BENEWAH Total		26	88	127	166	215	268	#####	#####	#####
Grand Total		139	85	121	155	203	244	#####	#####	#####

Standard deviation of mean back-calculated lengths at annulus formation - 1996

SPECIES

Brook Trout

LOCATION	Cohort	Number	1	2	3	4	5	6	7	8
ALDER	1996	19	#####	#####	#####	#####	#####	#####	#####	#####
	1995	3	5	#####	#####	#####	#####	#####	#####	#####
	1994	28	5	9	#####	#####	#####	#####	#####	#####
	1993	34	6	7	12	#####	#####	#####	#####	#####
	1992	21	5	6	31	10	#####	#####	#####	#####
	1991	8	4	8	9	16	21	#####	#####	#####
ALDER Total		113	5	8	20	12	21	#####	#####	#####
BENEWAH	1996	4	#####	#####	#####	#####	#####	#####	#####	#####
	1995	4	1	#####	#####	#####	#####	#####	#####	#####
	1993	4	54	18	18	#####	#####	#####	#####	#####
	1992	8	4	5	12	15	#####	#####	#####	#####
	1991	6	8	13	20	16	21	#####	#####	#####
BENEWAH Total		26	24	12	17	16	21	#####	#####	#####
Grand Total		139	12	9	20	16	29	#####	#####	#####

Mean back-calculated lengths at annulus formation by age class and cohort - 1997

SPECIES

Cutthroat Trout

Age Class

LOCATION	Cohort	Number	0	1	2	3	4	5	6	7	8
ALDER	1997	6	55	####	####	####	####	####	####	####	####
	1996	7	####	67	####	####	####	####	####	####	####
	1995	6	####	65	110	####	####	####	####	####	####
	1994	6	####	71	118	159	####	####	####	####	####
ALDER Total		25	55	68	114	159	####	####	####	####	####
BENEWAH	1997	5	60	####	####	####	####	####	####	####	####
	1996	7	####	69	####	####	####	####	####	####	####
	1995	20	####	67	113	####	####	####	####	####	####
	1994	9	####	80	128	183	####	####	####	####	####
	1993	6	####	74	124	177	220	####	####	####	####
	1992	1	####	72	135	189	242	295	####	####	####
	1990	1	####	73	117	179	214	258	302	337	####
	1989	1	####	68	107	154	193	224	271	302	349
BENEWAH Total		50	60	71	119	180	219	259	286	320	349
EVANS	1997	3	60	####	####	####	####	####	####	####	####
	1996	9	####	70	####	####	####	####	####	####	####
	1995	7	####	68	121	####	####	####	####	####	####
	1994	8	####	69	115	160	####	####	####	####	####
	1993	7	####	66	113	164	202	####	####	####	####
	1992	1	####	64	106	148	190	232	####	####	####
EVANS Total		35	60	68	116	161	200	232	####	####	####
LAKE	1997	5	57	####	####	####	####	####	####	####	####
	1996	5	####	68	####	####	####	####	####	####	####
	1995	22	####	65	114	####	####	####	####	####	####
	1994	14	####	62	110	151	####	####	####	####	####
	1993	3	####	67	105	155	205	####	####	####	####
	1991	1	####	63	125	176	227	268	320	####	####
	1990	2	####	67	122	167	207	248	297	338	####
LAKE Total		52	57	65	112	154	210	255	305	338	####
Grand Total		162	58	68	115	164	210	253	297	329	349

Standard deviation of mean back-calculated lengths at annulus formation - 1997

SPECIES

Age Class

Location	Cohort	Number	0	1	2	3	4	5	6	7	8
ALDER	1997	6	7	####	####	####	####	####	####	####	####
	1996	7	####	17	####	####	####	####	####	####	####
	1995	6	####	6	6	####	####	####	####	####	####
	1994	6	####	10	17	26	####	####	####	####	####
ALDER Total		25	7	12	13	26	####	####	####	####	####
BENEWAH	1997	5	2	####	####	####	####	####	####	####	####
	1996	7	####	7	####	####	####	####	####	####	####
	1995	20	####	11	14	####	####	####	####	####	####
	1994	9	####	8	15	27	####	####	####	####	####
	1993	6	####	10	12	23	27	####	####	####	####
	1992	1	####	####	####	####	####	####	####	####	####
	1990	1	####	####	####	####	####	####	####	####	####
	1989	1	####	####	####	####	####	####	####	####	####
BENEWAH Total		50	2	11	15	24	25	35	22	25	####
EVANS	1997	3	14	####	####	####	####	####	####	####	####
	1996	9	####	11	####	####	####	####	####	####	####
	1995	7	####	8	9	####	####	####	####	####	####
	1994	8	####	6	7	11	####	####	####	####	####
	1993	7	####	4	4	6	6	####	####	####	####
	1992	1	####	####	####	####	####	####	####	####	####
EVANS Total		35	14	7	8	9	7	####	####	####	####
LAKE	1997	5	3	####	####	####	####	####	####	####	####
	1996	5	####	5	####	####	####	####	####	####	####
	1995	22	####	6	10	####	####	####	####	####	####
	1994	14	####	5	9	10	####	####	####	####	####
	1993	3	####	3	8	8	12	####	####	####	####
	1991	1	####	####	####	####	####	####	####	####	####
	1990	2	####	0	1	1	8	2	9	3	####
LAKE Total		52	3	6	10	11	12	12	14	3	####
Grand Total		162	6	9	12	20	18	24	18	18	####

Mean back-calculated lengths at annulus formation by age class and cohort - 1997

SPECIES

Brook Trout

Location	Cohort	Number	0	1	2	3	4	5	6	7	8
ALDER	1997	3	58	####	####	####	####	####	####	####	####
	1996	5	####	69	####	####	####	####	####	####	####
	1995	16	####	58	104	####	####	####	####	####	####
	1994	10	####	65	107	143	####	####	####	####	####
	1993	4	####	63	102	133	167	####	####	####	####
	1992	3	####	73	128	183	244	299	####	####	####
ALDER Total		41	58	63	107	148	200	299	####	####	####
BENEWAH	1996	1	####	60	####	####	####	####	####	####	####
	1995	4	####	55	90	####	####	####	####	####	####
	1994	2	####	80	117	148	####	####	####	####	####
	1993	2	####	94	142	190	224	####	####	####	####
	1992	1	####	96	163	230	313	347	####	####	####
BENEWAH Total		10	####	72	115	181	254	347	####	####	####
Grand Total		51	58	65	109	155	216	311	####	####	####

Standard deviation of mean back-calculated lengths at annulus formation - 1997

SPECIES

Brook Trout

Location	Cohort	Number	0	1	2	3	4	5	6	7	8
ALDER	1997	3	7	####	####	####	####	####	####	####	####
	1996	5	####	3	####	####	####	####	####	####	####
	1995	16	####	17	22	####	####	####	####	####	####
	1994	10	####	10	20	30	####	####	####	####	####
	1993	4	####	6	19	28	48	####	####	####	####
	1992	3	####	7	14	13	18	22	####	####	####
ALDER Total		41	7	13	21	31	55	22	####	####	####
BENEWAH	1996	1	####	####	####	####	####	####	####	####	####
	1995	4	####	4	17	####	####	####	####	####	####
	1994	2	####	5	10	2	####	####	####	####	####
	1993	2	####	1	8	15	3	####	####	####	####
	1992	1	####	####	####	####	####	####	####	####	####
BENEWAH Total		10	####	19	30	35	51	####	####	####	####
Grand Total		51	7	15	23	34	57	30	####	####	####

Coeur d'Alene Tribe
Fish, Water, and Wildlife Program

BPA Annual Report, 1998

Coeur d'Alene Tribe Department of Natural Resources
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Abstract

As part of an ongoing project to restore fisheries resources in tributaries located on the Coeur d'Alene Indian Reservation, this report details the activities of the Coeur d'Alene Tribe's Fisheries Program for FY 1997 and 1998. This report 1) analyses the effect introduced species and water quality have on the abundance of native trout in Coeur d'Alene Lake and selected target tributaries; 2) details results from an ongoing mark-recapture study on predatory game fish; 3) characterizes spawning habitats in target tributaries and evaluates the effects of fine sediment on substrate composition and estimated emergence success; and 4) provides population estimates for westslope cutthroat trout in target tributaries.

Low dissolved oxygen values in the hypolimnion of Coeur d'Alene Lake continue to be a cause for concern with regard to available fisheries habitat. Four sample sites in 1997 and eight sample sites in 1998 had measured levels of dissolved oxygen below what is considered optimum (6.0 mg/L) for cutthroat trout. As well, two sample points located north of the Coeur d'Alene River showed hypolimnetic dissolved oxygen deficits. This could lead to a more serious problem associated with the high concentration of heavy metals bound up in the sediment north of the Coeur d'Alene River. Most likely these oxygen deficits are a result of allochthonous input of organic matter and subsequent decomposition.

Sediment loading from tributaries continues to be a problem in the lake. The build up of sediments at the mouths of all incoming tributaries results in the modification of existing wetlands and provides ideal habitat for predators of cutthroat trout, such as northern pike and largemouth bass. Furthermore, increased sediment deposition provides additional substrate for colonization by aquatic macrophytes, which serve as forage and habitat for other non-native species.

There was no significant difference in the relative abundance of fishes in Coeur d'Alene Lake from 1997 to 1998. Four out of the six most commonly sampled species are non-native. Northern pikeminnow and largescale suckers are the only native species among the six most commonly sampled. Northern pikeminnow comprise 8-9% of the electroshocking catch and 18-20% of the gillnet catch. Largescale suckers comprise 24-28% of the electroshocking catch and 9-21% of the gillnet catch. Cutthroat trout and mountain whitefish, on the other hand, comprise less than 1% of the catch when using electroshocking methods and about 1.4% of the gillnet catch.

Since 1994, the Coeur d'Alene Tribe Fish, Water and Wildlife Program has conducted an extensive mark-recapture study (Peters et al. 1999). To date, 636 fish have been tagged and 23 fish have been recaptured. We are finding that northern pike have a tendency to migrate from the original sampling site, while largemouth bass appear very territorial, rarely moving from the site where they were tagged. Both species are most commonly associated with shallow, near-shore habitats, where the potential for encountering seasonal migrations of cutthroat trout is maximized.

Low-order tributaries provide the most important spawning habitat for cutthroat trout on the Reservation. The mapped distribution of potentially suitable spawning gravel was patchy and did not vary considerably within reaches or between watersheds. Furthermore, the quantity of spawning gravel was low, averaging just 4.1% of measured stream area. The lack of a strong association between spawning gravel abundance and several reach characteristics (gradient, proportion of gravel and pea gravel) corroborates the findings of other authors who suggest that local hydrologic features influence spawning gravel availability. Although the distribution of spawning substrate was patchy within the target watersheds, there is probably adequate habitat to support resident and adfluvial spawners because of currently depressed numbers.

Spawning gravels in target tributaries of the Reservation contained proportions of fine sediments comparable to those in egg pockets of salmonid redds in the Rocky Mountain region. At 23 of 29 sample sites, low levels of fine sediment led to high predictions of overall embryo survival (mean = 28.4%). The estimates of fry production potential at sample sites ranged widely (0.0 to 31.2 fry/100 square meters) due, primarily, to the quantity of suitable gravels present. Only in the mainstem of Lake Creek were the proportions of both small and coarse fines considered above the levels for these particle sizes (10% and 30%, respectively) shown to adversely affect salmonid emergence success. Of the 6 sites where high levels of small or coarse fines were recorded, only the sites located in the mainstem of Lake Creek showed supporting evidence for low recruitment. The other sites had juvenile and adults densities (range = 12.4 – 33.8/100 square meters) that were notably higher than the average density (9.2/100 square meters) reported for seven other westslope cutthroat trout populations in Idaho and Montana. The habitat areas that supported higher than average trout densities, however, comprise relatively small fractions of the available habitat in the respective watersheds.

Due to the persistence of adverse water quality and habitat conditions in Reservation streams, cutthroat trout populations are thought to be at least moderately damaged. The average spawning escapements fall between the minimum viable population and the number of adults needed to produce 50% of the carrying capacity of the stream environment. None of the populations on the Coeur d'Alene Reservation are thought to be greater than or equal to 50% of the historic potential. These weakened populations may be particularly susceptible to normal environmental variability (such as temperature and stream discharge patterns) and to the frequency of extreme events such as wildfires, floods, or debris torrents. On the other hand, very little hybridization has occurred, suggesting that preservation of the existing genetic diversity may continue to allow for genetic combinations that permit survival in highly variable environments.

Acknowledgements

Many individuals contributed to the completion of this report. A special thanks to:

George Aripa
Abel C. Sanchez
Richard Allen
John LaSarte
Sam Sanchez
Jeff Jordon
Kevin Brown
Darryl Trevino
Jim Whistocken
Charles Peone
Brian Harper
Carla Moore
And the rest of the Coeur d'Alene Tribe Fish, Water and Wildlife Program Staff
And the Coeur d'Alene Tribal Council, Ernie Stensgar Tribal Chairman

Funding was provided by the U.S. Department of Energy, Bonneville Power Administration.

Table of Contents

1.0 Introduction 1

Fisheries Management History of the Coeur d'Alene System 1
Current Study Objectives 3
Study Area 3

2.0 Methods and Materials 4

2.1 Lake Studies 4
2.1.1 Water Quality 4
2.1.2 Fisheries 6

2.2 Stream Studies 8
2.2.1 Water Quality 8
2.2.2 Spawning Gravel Survey and Analysis 9
2.2.3 Population Surveys 10

3.0 Results 16

3.1 Lake Studies 16
3.1.1 Water Quality 16
3.1.2 Fisheries 33

3.2 Stream Studies 38
3.2.1 Water Quality 38
3.2.2 Spawning Gravel Survey and Analysis 41
3.2.3 Population Surveys 41

4.0 Discussion 48

4.1 Lake Studies 48
4.2 Stream Studies 51

5.0 Bibliography 55

Appendix A. Vertical hydrolab profiles of thirteen stations on Coeur d'Alene Lake, 1997 and 1998.

Appendix B. Water quality results from Coeur d'Alene Lake during 1997 and 1998.

Appendix C. Secchi readings and empirically derived estimates of euphotic zone depth for thirteen stations on Coeur d'Alene Lake, 1997 and 1998.

Appendix D. Age distribution, length and weight frequencies and length and weight regression graphs for aged species sampled in Coeur d'Alene Lake, 1997 and 1998.

Appendix E. Statistics of mean length and weight, standard deviation and range for all aged species sampled in Coeur d'Alene Lake, 1997 and 1998.

Appendix F. Analysis of Spawning gravel beds in select tributaries of the Coeur d'Alene Reservation, 1998.

Appendix G. Cohort analysis of growth for cutthroat trout and brook trout in select tributaries of the Coeur d'Alene Reservation, 1998.

List of Tables

Table 2.1 Water quality sample sites on Coeur d'Alene Lake grouped by habitat area 6

Table 2.2 Stream water quality sites and monitoring parameters... 9

Table 2.3 Juvenile and adult fish traps were operated at eleven different locations in the four target drainages 16

Table 3.1 Water qualilty stations on Coeur d'Alene Lake that had dissolved oxygen readings less than 6.0 mg/L 17

Table 3.2 Average annual and sesonal secchi measurements taken at thirteen stations on Coeur d'Alene Lake, 1997.. 31

Table 3.3 Average annual and sesonal secchi measurements taken at thirteen stations on Coeur d'Alene Lake, 1998.. 32

Table 3.4 Electroshocking relative abundance results from 1997 and 1998 33

Table 3.5 Electroshocking catch per unit effort during 1997 35

Table 3.6 Gillnetting relative abundance results from 1997 and 1998... 35

Table 3.7 Gillnetting catch per unit effort during 1997... 36

Table 3.8 Electroshocking catch per unit effort during 1998 36

Table 3.9 Gillnetting catch per unit effort during 1998... 37

Table 3.10 Habitat suitability index for lucustrine cutthroat trout 1997 39

Table 3.11 Habitat suitability index for lucustrine cutthroat trout 1998 40

Table 3.12 Means of habitat features in spawning reaches of the four target watersheds 41

Table 3.13 Number of cores, substrate composition of cores, predicted mean emergence success and mean estimated production potential for reaches of the four target watersheds 42

Table 3.14 Cutthroat trout abundance and distribution 1998 44

Table 3.15 Brook trout abundance and distribution 1998 45

Table 3.16 Age frequency distribution of cutthroat trout 1998... 45

Table 4.1 Mean portion of fines and mean fredle index of egg pockets in salmonid redds..................... 52

Table 4.2 Estimated mean annual variance in the infinitesimal rate of growth and probabilities of persistence over 100 years 53

List of Figures

Figure 2.1 Coeur d'Alene Lake water quality sample sites 5

Figure 2.2 Coeur d'Alene Lake fisheries sample sites 7

Figure 2.3 Lake Creek shock sites 12

Figure 2.4 Benewah Creek shock sites 13

Figure 2.5 Evans Creek shock sites 14

Figure 2.6 Alder Creek shock sites 15

Figure 3.1 Temperature profiles for Chatcolet Lake Shallow and Round Lake, 1997 and 1998 19

Figure 3.2 Temperature profiles for Benewah Lake, Chatcolet Lake Deep and Hidden Lake, 1997 and 1998 21

Figure 3.3 Temperature profiles for Rockford Bay, Carey Bay, Windy Bay Shallow, 1997 and 1998 22

Figure 3.4 Temperature profiles for Conkling Point, Mid Lake Coeur d'Alene and Windy Bay Deep, 1997 and 1998 23

Figure 3.5 Temperature profiles for Coeur d'Alene River, 1997 and 1998 24

Figure 3.6 Temperature profiles for St. Joe River, 1997 and 1998 25

Figure 3.7 pH profiles for Benewah Lake, Chatcolet Lake Deep and Hidden Lake, 1997 and 1998 27

Figure 3.8 pH profile for Chatcolet Lake Shallow, 1998 28

Figure 3.9 Conductivity profile Coeur d'Alene River, 1997 29

Figure 3.10 Regression equations of body length and age for cutthroat and brook trout, 1998 46

Figure 3.11 Cutthroat trout migration timing and age frequency in Benewah Creek, 1998 47

Figure 3.12 Cutthroat trout migration timing and age frequency in Lake Creek, 1998 47

1.0 Introduction

The recent decline in native salmonid stocks, in particular cutthroat trout (Oncorhynchus clarki lewisi, Richardson) and bull trout (Salvelinus confluentus, Walbaum) throughout the Coeur d'Alene basin has eliminated the subsistence fisheries for the Coeur d'Alene Tribe. Historically, the Coeur d'Alene Tribe depended on runs of anadromous salmon and steelhead along the Spokane River and Hangman Creek, as well as resident and adfluvial forms of trout and char in Coeur d'Alene Lake. Dams constructed on the Spokane River at Monroe Street in the City of Spokane and at Little Falls further downstream, were the first dams that initially cut-off the anadromous fish runs from the Coeur d'Alene Tribe. These fisheries were further removed by the construction of Chief Joseph and Grand Coulee Dams on the Columbia River. Together, these actions forced the Tribe to rely solely on the resident fish resources of Coeur d'Alene Lake (Staff Communication).

Many factors contributed to the decline of native salmonid fish stocks in the Coeur d'Alene Basin. These factors include: construction of dams along the Spokane and Columbia Rivers, pollution caused by mining and municipal waste, increases in logging and agricultural activities and species interactions between introduced and native fish species in Coeur d'Alene Lake. Post Falls Dam, built on an exiting natural migration barrier in 1906 to supply hydroelectric power to the growing community, raised the water level of Coeur d'Alene Lake by approximately 3.6 meters. This higher lake level inundated traditional Coeur d'Alene Tribal fish traps like the one operated on the St. Joe River at Mission Point for over 50 years (Scholz et al. 1985) and forever changed the physical and hydrologic characteristics of Coeur d'Alene Lake. The higher lake level created conditions that favored introduced species, as well as, native species other than salmonids.

Fisheries Management History of the Coeur d'Alene System

Scholz et al. (1985) estimated that historically the Coeur d'Alene Indian Tribe harvested around 42,000 cutthroat per year. In 1967, Mallet (1968, 1969) reported that 3,329 cutthroat were harvested from the St. Joe River, and a catch of 887 was reported from Coeur d'Alene Lake. This catch is far less than the 42,000 fish per year the tribe harvested historically. Today, only limited opportunities exist to harvest cutthroat trout. Within the Reservation boundaries Lake Creek and its tributaries and Benewah Creek and its tributaries are closed to all fishing until further notice. Both of the above closures extend 100 yards into Coeur d'Alene Lake from the mouth of the respective streams. Bull trout were listed as threatened under the Endangered Species Act in 1998, eliminating harvest opportunities for this species. In other portions of the Spokane River basin, including Coeur d'Alene Lake, only one cutthroat trout over 14" may be harvested per day. The Coeur d'Alene Lake system has three very distinct stocks of cutthroat trout. They are adfluvial-lacustrine, fluvial and resident. Peters et al. (1999) and Graves et al. (1990) have a more detailed description of the different stock types.

In an attempt to diversify the fishery in Coeur d'Alene Lake and offset losses to native trout fisheries, kokanee salmon (Oncorhynchus nerka, Walbaum) were introduced into the Coeur d'Alene Lake system in 1937. As kokanee salmon numbers began to increase and stocking was no longer necessary they soon became the most abundant and sought after fish in the lake. By 1967, total harvest of kokanee salmon from Coeur d'Alene Lake was second only to Pend Oreille Lake within the State of Idaho. However, kokanee soon reached their carrying capacity within the lake and in 1982, the Idaho Department of Fish and Game introduced chinook salmon (Oncorhynchus tshawytscha, Walbaum) in an attempt to control the burgeoning yet stunted kokanee population. A hatchery run of chinook salmon was established in Wolf Lodge Creek. Attempts were made to control the establishment of naturally reproducing populations of chinook salmon in the lakes' tributaries, however, chinook salmon became established in both the Coeur d'Alene and St. Joe River systems. It is unclear what impacts spawning and rearing chinook salmon have or will have on native trout species.

In 1987, the Northwest Power Planning Council (NPPC) amended the Columbia River Basin Fish and Wildlife Program to include baseline stream survey of tributaries located on the Coeur d'Alene Indian Reservation [section 903 (g)(1)(B)]. Initial studies conducted in 1990 by the Coeur d'Alene Tribe identified twenty-one Reservation streams flowing into Coeur d'Alene Lake, the St. Joe River and the St. Maries River as having potentially suitable habitat for trout species. Data obtained from a subsequent aerial survey prioritized ten of the original twenty-one survey streams for further study, based geographic location, accessibility by trout, and acceptable gradient and habitat (Graves et al. 1990). After compiling data on trout abundance and distribution, growth rates, and benthic macroinvertebrate densities, four tributary streams including Lake, Benewah, Evans and Alder Creeks were selected as having the highest potential for improvement and enhancement. See Graves et al. (1990) and Lillengreen et al. (1993) for further discussions of the past history of the study area.

In 1994, the NPPC adopted the recommendations set forth by the Coeur d'Alene Tribe to improve the Reservation fisheries. These actions included: 1.) Implement habitat restoration and enhancement measures in Lake, Benewah, Evans, and Alder Creeks; 2.) Purchase critical watershed areas for protection of fisheries habitat; 3.) Conduct an educational/outreach program for the general public within the Coeur d'Alene Indian Reservation to facilitate a "holistic" watershed protection process; 4.) Develop an interim fishery for Tribal and non-Tribal members on the Reservation through construction, operation and maintenance of five trout ponds; 5.) Design, construct, operate and maintain a trout production facility; and 6.) Implement a five-year monitoring program to evaluate the effectiveness of the hatchery and habitat improvement projects. These principles, priorities, and objectives were also adopted into the 1995 Fish and Wildlife Program (Section 10 Resident Fish, see paragraph 10.8B.20).

Subsequent studies by the Coeur d'Alene Tribe have determined that the following factors effectively limit the population of cutthroat trout in natal streams and in Coeur d'Alene Lake:

- Stochastic events that result in increased mortality of embryo, fry, and juvenile lifestages (e.g. peak flow events) have been exacerbated by land use practices during the last 60 years;
- Competition for limited space and food during base flow conditions cause displacement of juveniles into water quality limited stream reaches;
- Competitive interactions with introduced salmonids may result in replacement of native trout in Alder Creek and Benewah Creek;
- Water temperatures in the upper ten meters of the water column in Coeur d'Alene Lake exceed the optimum as described in the Habitat Suitability Index for cutthroat trout;
- Sediment loading from tributaries in combination with large quantities of aquatic macrophyte growth and low dissolved oxygen concentrations in the hypolimnion promote conditions more favorable for introduced fish species in the lake; and
- Competitive interactions with introduced species for food, living space, and through predation limit cutthroat trout in both the littoral and limnetic zones of Coeur d'Alene Lake.

Spikes in peak flows exceeded the sheer stress for spawning gravels (5-cm geometric mean particle diameter) during the cutthroat trout egg incubation period in some tributaries during the last few years (Peters et al. 1999). It is conceivable that flow events of this magnitude could scour trout redds and result in complete year class failures. Water quality has been sampled on the four target tributaries since 1990 and studies show that conditions have remained fairly consistent for dissolved oxygen, temperature, pH and conductivity (Graves et al. 1990; Lillengreen et al. 1993 and 1996; Peters et al. 1999). Temperature appears to be the factor that is most influencing cutthroat trout production in the streams. All streams exceeded the optimum limit of 15.5^{o} C for cutthroat trout during low flow periods in each of the last nine years. Today, there are 21 identified fish species in Coeur d'Alene Lake. Of these 21, only seven are native to Coeur d'Alene Lake. They include cutthroat trout, bull trout, mountain whitefish (Prosopium williamsoni, Girard), sculpin (Cottus sp.), (there may be more than one species of sculpin in the lake), northern pikeminnow (Ptychocheilus oregonensis, Richardson), largescale sucker (Catostomus macrocheilus, Girard), and longnose sucker (Catostomus catostomus, Forster). For a list of the 14 non-native species and their scientific names see Peters et al. (1999).

Current Study Objectives

Objective 1: Estimate fisheries relative abundance in Coeur d'Alene Lake using electroshocking and gillnetting.

Tasks 1.1 Measure all fish species for length and weight, and take scale samples from game fish.

Objective 2: Examine the effects of introduced fishes on native species of cutthroat and bull trout in Coeur d'Alene Lake.

Tasks 2.1 Correlate population statistics with data on habitat types.

Objective 3: Conduct population estimates in Coeur d'Alene Lake using mark-recapture techniques.

Tasks 3.1 Game fish that are greater than 300g and/or 300mm mark with a floy tag to obtain density estimates and monitor movement.

Objective 4: Examine the age structure of sampled fish from scales taken during sampling periods.

Tasks 4.1 Scale data will be used to monitor the status of successive cohorts.

Objective 5: Continue collecting baseline water quality data on Coeur d'Alene Lake.

Tasks 5.1 Nutrients, total kjeldahl nitrogen, total phosphorus, turbidity, total suspended solids, metals and chlorophyll$_a$ will be sampled.

Tasks 5.2 Dissolved oxygen, temperature, pH, conductivity, depth and secchi readings will be taken.

Objective 6: Examine the effects of water quality parameters on the abundance and distribution of westslope cutthroat trout in target tributaries.

Tasks 6.1 Continue monitoring stream discharge, dissolved oxygen, temperature, pH and conductivity at selected sites in Alder, Benewah, Evans and Lake creeks.

Objective 7: Determine if fine sediment is limiting recruitment of cutthroat trout populations in target tributaries.

Tasks 7.1 Characterize spawning habitats of cutthroat trout in areas annually sampled for population estimation.

Tasks 7.2 Evaluate effects of sedimentation on substrate composition and estimated emergence success.

Objective 8: Characterize the abundance and distribution of westslope cutthroat trout and brook trout in target tributaries and compare results with previous sample efforts.

Tasks 8.1 Develop population estimates for selected sites using electroshocking techniques.

Tasks 8.2 Examine age class structure of resident trout.

Tasks 8.3 Monitor immigration and emigration of cutthroat trout in Lake and Benewah Creeks.

Study Area

The Coeur d'Alene Indian Reservation encompasses 139,005 hectares (343,478 acres) in the panhandle section of north Idaho. Many lakes, streams, and rivers are located on the Reservation. The principle waterbody on the Reservation is Coeur d'Alene Lake. Coeur d'Alene Lake is the second largest lake in Idaho and is located within the 1,730,023-hectare (4,274,888 acres) Spokane River drainage basin. The lake lies in a naturally dammed river valley with the outflow currently controlled by Post Falls Dam. Post Falls Dam also controls the level of the St. Joe River upstream to the town of St. Maries. At full pool (lake elevation 648.7 meters) the lake covers 129 square kilometers and at minimum pool level (lake elevation of 646.2 meters) the lake covers 122 square kilometers. The lake is 43 kilometers long and anywhere from 2 to 10 kilometers wide. Mean depth is 22 meters with a maximum depth of 63.7 meters (Woods and Berenbrock 1994). The lake is located in two Idaho counties: Kootenai and Benewah. Population centers around the lake are located on the northern most shoreline (Coeur d'Alene) and at the mouth of the Coeur d'Alene River (Harrison). The city of Coeur d'Alene is the largest in Kootenai County and Harrison is the second largest in Benewah County. The largest town in Benewah County (St. Maries) lies about 12 miles upstream of Coeur d'Alene Lake on the St. Joe River.

The two main tributaries of Coeur d'Alene Lake, the Coeur d'Alene and St. Joe Rivers, drain the Coeur d'Alene and St. Joe Mountains. These mountains are composed of primarily metasedimentary rocks of the belt group with local intrusions of granitics. Lower elevations are composed primarily of glaciofluvial deposits. This area receives some of the highest amounts of precipitation in Idaho. The lake receives about 25.4 inches of precipitation annually with more in the higher elevations around the lake (38.3 inches Wallace, ID). The southern end of Coeur d'Alene Lake is made up of four shallow lakes (Hidden, Round, Chatcolet, and Benewah) flooded as a result of construction of Post Falls Dam. Geological data was taken from U.S. Department of Agriculture (1984).

The four tributaries selected for restoration are located almost exclusively on the Reservation and have a combined basin area of 34,853 hectares (86,123 acres) and include 529 kilometers (328 miles) of intermittent and perennial stream channels. The climate and hydrology of the target watersheds are similar in that they are influenced by the maritime air masses from the pacific coast, which are modified by continental air masses from Canada. Summers are mild and relatively dry, while fall, winter, and spring brings abundant moisture in the form of both rain and snow. A seasonal snowpack generally covers the landscape at elevations above 4,500 feet from late November to May. Snowpack between elevations of 3,000 and 4,500 feet falls within the “rain-on-snow zone” and may accumulate and deplete several times during a given winter due to mild storms (US Forest Service 1998). The precipitation that often accompanies these mild storms is added directly to the runoff, since the soils are either saturated or frozen, causing significant flooding.

Anthropogenic disturbances are common in the target watersheds. Recent clearing of land for homesteads, logging, pasture, and agriculture has enhanced the rain-on-snow phenomenon and accelerated the rate of snow pack depletion. In Lake Creek for example, where nearly 40 percent of the basin area has been cleared for agriculture, peak discharges have increased by an estimated 55% for 100-year events when compared with the pre-settlement period (Peters et al. 1999). Lesser amounts of forest clearing have occurred in the other target watersheds, suggesting measurable increases in peak discharges for these areas as well. One of the more profound disturbances that the watersheds have been subjected to is from road construction. The road network includes five state highways, numerous county and municipal roads, and an extensive network of unimproved roads. Those areas with the highest density of roads occur on lands managed primarily for timber production. This road system has been constructed in many of the most sensitive locations (floodplains, and unstable land types) within the watersheds. The density of unimproved roads exceeds 2.5-miles/mile^2 in each of the affected watersheds.

2.0 Materials and Methods

2.1 Lake Studies

2.1.1 Water Quality

There are five distinct habitat areas in the southern third of Coeur d’Alene Lake that can be distinguished based on geomorphologic condition. The first of these areas is comprised of two shallow water stations

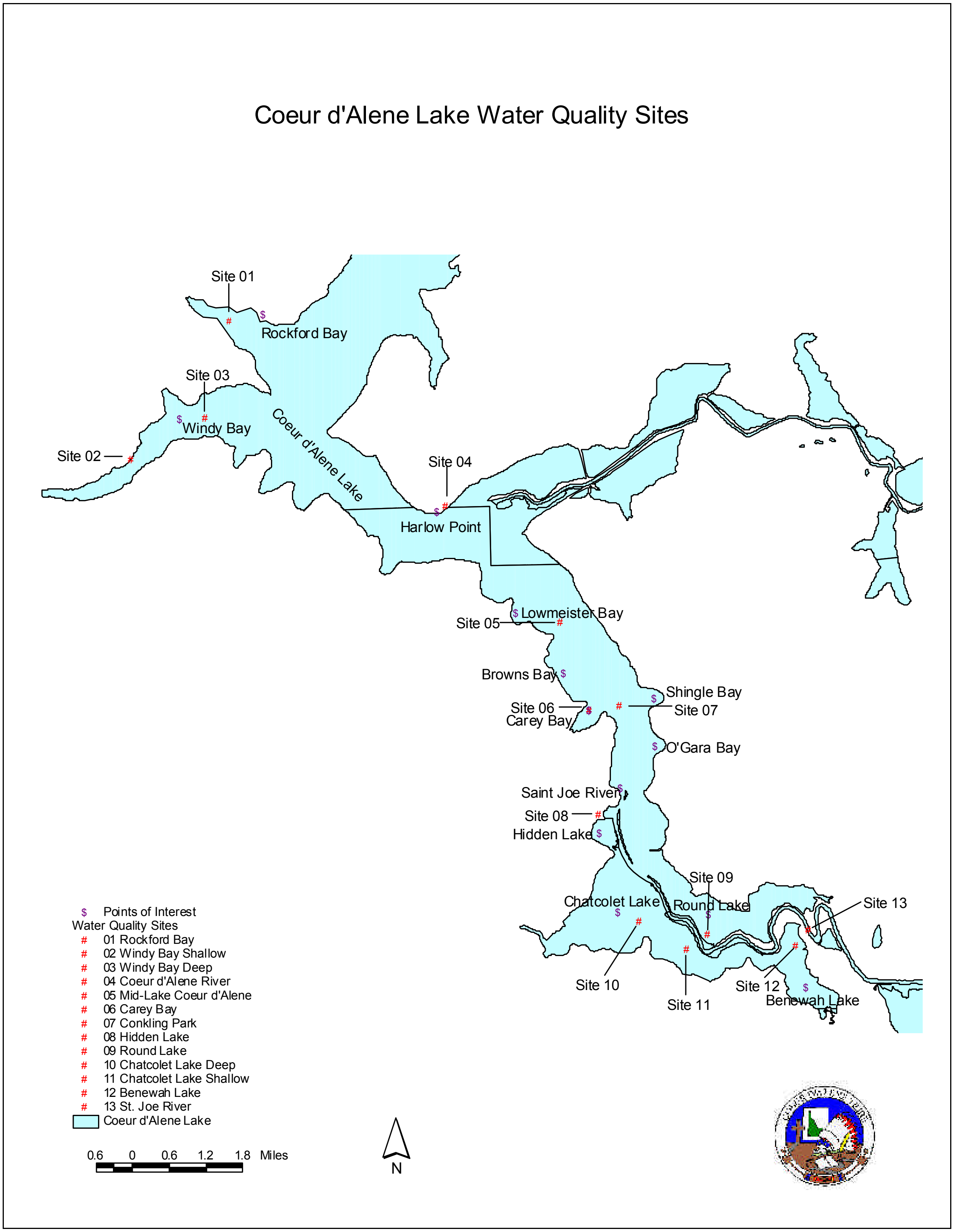


Figure 2.1 Water quality sites on Coeur d'Alene Lake, 1997 and 1998.

created entirely by inundation from Post Falls Dam. This area is dry during the drawdown period and wetted at full pool. The second habitat area is comprised of the three shallow, southern chain lakes of the St. Joe River. These lakes were separated from the Coeur d'Alene Lake system until the completion of Post Falls Dam. The third area consists of three deep, open water sections within the main body of Coeur d'Alene Lake. These areas are considered pelagic in nature. The fourth habitat area consists of three semi-isolated shallow bay areas located in the main Coeur d'Alene Lake. The fifth area is riverine habitat inundated by waters from Post Falls Dam.

A total of thirteen monitoring stations have been established to cover each distinct habitat area (Figure 2.1 and Table 2.1). Combinations of field and laboratory analytical methods were used to sample Coeur d'Alene Lake. See Peters et al. (1999) for a further description on the physical and chemical parameters being sampled as well as, methods used for sampling. A Hydrolab (trade name for a multi-parameter testing probe) was used to get vertical profiles of dissolved oxygen, temperature, pH and conductivity. A kemmerer bottle was used for sampling all other parameters except for water clarity, where a secchi disk was used.

2.1.2 Fisheries

The southern section of Coeur d'Alene Lake from Windy Bay south has twelve transect sampling areas that can be grouped based on similar geomorphology (Figure 2.2). Each transect is broken into sample reaches that encompass all habitat types within the transect. Each transect has from 1 to 4 sample reaches. The reach locations were determined by visual habitat characteristics and transect size. These reaches were chosen in order to best represent the shoreline habitat within the transect area. The collective submerged habitat within all reaches spans the range of conditions within each transect area (Peters et al. 1999).

Table 2.1 Water quality sample stations grouped by habitat area.

Habitat Area	Stations
Shallow Water	Round Lake Chatcolet Lake Shallow
Southern Chain Lakes	Benewah Lake Chatcolet Lake Hidden Lake
Interior Bays	Carey Bay Windy Bay Shallow Rockford Bay
Open Water	Conkling Point Mid Lake Windy Bay Deep
Inundated Rivers	Coeur d'Alene River St. Joe River

<u>*Shoreline Electrofishing*</u>

The sampling schedule for electroshocking and gillnetting is designed to capture data related to significant changes in relative abundance of various fish species throughout the year. A custom-built aluminum boat equipped with a Smith Root 7.5 GPP electroshock unit was used to conduct shoreline electrofishing. This technique is most effective in water less than 8 feet deep. Each reach was sampled for 5-10 minute, depending on fish density. After completion of the shocking effort, all captured fishes were measured for total length and weight, with scale samples taken only from game species.

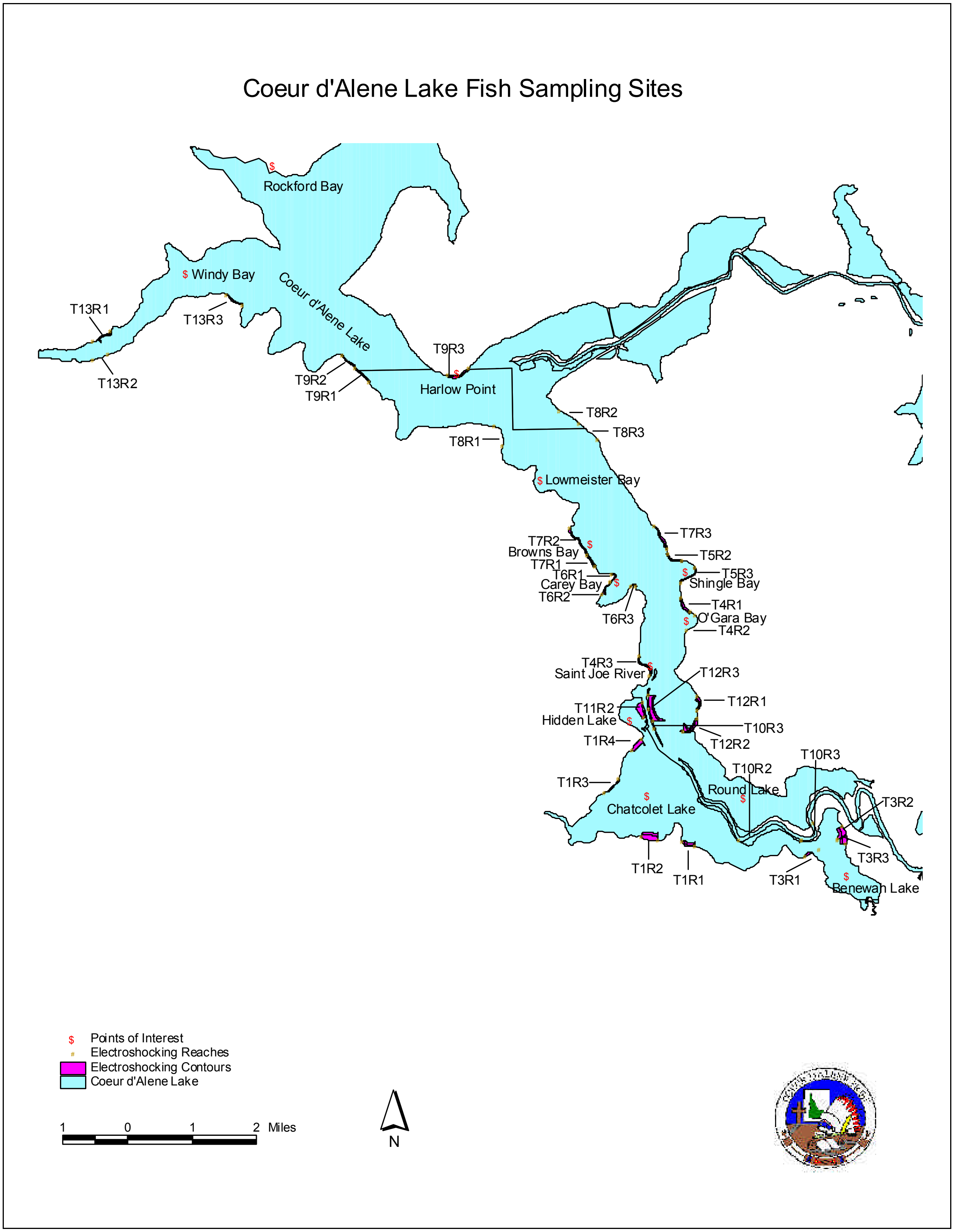


Figure 2.2 Electroshocking and gillnet sites on Coeur d'Alene Lake, 1997 and 1998.

Gillnet Sampling
Nets were used to sample areas that could not be efficiently sampled using the electrofishing technique, and helped examine species composition as well as seasonal usage in the littoral and limnetic zones. Two different types of nets were used for sampling fish in different habitat areas. Vertical gillnets were used in areas with water depths greater than 30 feet (pelagic zones), while horizontal gillnets were used in shallow areas (8-30 feet deep). The vertical gillnets were 6 feet wide and 120 feet in length with mesh sizes of 2.5", 3", 4", and 5 inches. Horizontal gillnets were made of graded mesh monofilamant 8'X200', 10'X200' and 12'X150'. Data recorded following the sample effort included depth of capture, total length, weight and scale samples.

Age Analysis
Age was determined for all game species captured using methods described by Jearld (1983). Age frequency distributions were plotted for each species to describe the status of successive cohorts. By examining age frequency over time, instances of mortality as well as overall population trends will be identifiable.

Habitat Suitability Index
The lacustrine habitat suitability index model developed by Hickman and Raleigh (1982) was used to predict suitable habitat for cutthroat trout in Coeur d'Alene Lake. The model consists of a water quality and a reproduction component. The lucustrine water quality component uses three variables: maximum temperature (V_1), average minimum dissolved oxygen (V_3) and pH (V_{13}). Individual suitability index (SI) values were calculated for each variable using curves published in Hickman and Raleigh (1982). The following equation was used to ascertain the final SI values:

$$C_{wq} = (V_1 x V_3 x V_{13})^{1/3}$$

Where C_{wq} = HSI for the water quality component, and
V_n = suitability index for water quality variables.

2.2 Stream Studies

2.2.1 Water Quality
Water quality monitoring was conducted on 13 streams in 1997 (Table 2.2). Each stream was sampled for the same parameters as described above for lake studies, except for $chlorophyll_a$. Metals analyses were only completed at the two Fighting Creek sample sites. Additional monitoring parameters are described below.

A stage/discharge relationship was developed for each stream based on a linear regression of staff gauge height vs. stream discharge. The rating curve was used to determine the annual water budget for each stream sampled. Staff gauge heights were recorded to the nearest 0.002 of a foot. Discharge measurements were taken at low, medium, and high flows in order to complete the rating curve. Discharge measurements were taken in accordance with standard IFIM methodologies (Bovee 1982). The wetted stream channel was divided into 20 equal cells and water velocity was measured in each cell using a Price model 622 digital flow meter. Discharge for each cell was calculated by multiplying the cell width by depth and velocity. All individual cell discharges were summed to determine total discharge in cubic feet per second. Channel profiles were measured to evaluate changing flow dynamics over time.

2.2.2 Spawning Gravel Survey and Analysis
Potential spawning tributaries were identified over the past six years based on trapping results and population surveys. Active migration into tributaries by adult fish and/or presence of young-of-the-year trout was used as an indication of spawning activity for the purposes of this survey. Habitat features and the area of potential spawning gravel were measured at established shock sites in each tributary.

Table 2.2 Stream water quality sites and monitoring parameters, 1998.

Location	Discharge	Temperature	DO	pH	Conductivity	Turbidity	TSS	Metals	Nutrients
Lower Plummer Creek	X	X	X	X	X	X	X		X
Little Plummer Creek	X	X	X	X	X	X	X		X
Lower Lake Creek	X	X	X	X	X	X	X		X
Upper Lake Creek	X	X	X	X	X	X	X		X
Lower Fighting Creek		X	X	X	X	X	X	X	X
Upper Fighting Creek		X	X	X	X	X	X	X	X
Evans Creek[a]	X	X	X	X	X	X	X		X
East Fork Evans	X	X	X	X	X	X	X		X
Cherry Creek	X	X	X	X	X	X	X		X
Benewah Creek[b]	X	X	X	X	X	X	X		X
Windfall Creek	X	X	X	X	X	X	X		X
School House Creek	X	X	X	X	X	X	X		X
West Fork Benewah Creek	X	X	X	X	X				
Northr Fork Alder	X	X	X	X	X	X	X		X
Alder Creek	X	X	X	X	X	X	X		X
Hangman Creek	X	X	X	X	X	X	X		X
Little Hangman Creek	X	X	X	X	X	X	X		X
Indian Creek	X	X	X	X	X	X	X		X
Moctileme Creek	X	X	X	X	X	X	X		X
North Fork Rock Creek	X	X	X	X	X	X	X		X

[a] Evans Creek had two sampling stations, Evans and Upper Evans.
[b] Benewah Creek had two sampling stations, Three Mile and Upper Benewah.

Habitat features were measured according to the procedures described by Hankin and Reeves (1988). Proceeding upstream, we described each channel unit (pool, riffle, etc.) and measured its length, mean wetted width, and mean and maximum depths. The area of potential spawning gravel was measured with a meter stick and expressed as a percent of the total surface area at bank full flow. Potential spawning gravel was defined according to Magee et al. (1996) as patches of substrate at least 0.25 m^2 in area with particles 2-35 mm in diameter. In pool tailouts and riffles, we measured substrate composition with the pebble count technique (Wolman 1954), using 100 data points at each site. Substrate was classified as sand-silt (<2 mm in diameter), pea gravel (2-16 mm), gravel (17-64 mm), rubble (65-128 mm), cobble (129-256 mm), or boulder (>256 mm).

To quantify substrate conditions near the time of emergence, we collected core samples using a McNeil hollow-core sampler (Platts et al. 1983) from pockets of potentially suitable spawning gravel. Cores were taken to a depth of 10-20 cm to mimic egg pocket depths observed in cutthroat trout redds (Magee et al. 1996). Oven-dried samples were weighed after being mechanically shaken through sieves of 63.5, 31.5, 16, 8, 6.3, 4.75, 2.0, 1.0, 0.85, 0.5, 0.125, and 0.25 mm. As recommended by Chapman (1988) and Young et al. (1991), we expressed substrate composition by two methods: the percentage of fine substrate smaller than a given size (6.3 and 0.85 mm), and by a measure of central tendency, the fredle index ($F_i = D_g/S_o$; where D_g is the geometric mean particle diameter and S_o is a sorting coefficient).

We predicted fry emergence success for each core sample using the equation developed by Weaver and Fraley (1993) for westslope cutthroat trout:

$$\% \text{ emergence} = -0.7512 (\text{arcsine } \% \; SP_{6.3}) + 39.67$$

where, $SP_{6.3}$ = percentage of substrate particles smaller than 6.3 mm.

The maximum fry production potential for each shock reach was estimated by combining data on potential redd number, estimated egg deposition, and average substrate composition of core samples. Egg deposition (E) was calculated using a length-fecundity relation for westslope cutthroat trout: $E = 82.63e^{0.007958L}$, where L is fork length in millimeters (C. Downs and B. Shepard, Montana State University, personal communication). The average fork length for adfluvial females (310 mm), as measured at migration traps over the last four years, was used in the equation. Fry production was estimated by multiplying total estimated egg deposition by estimated emergence success.

2.2.3 Population Survey

The channel types delineated during previous surveys (Lillengreen, 1993) served as the basic geomorphic units for selecting sample sites for conducting fish population surveys. In these early channel type surveys, stream reaches were classified into relatively homogeneous types according to broad geomorphologic characteristics of stream morphology as defined by Rosgen (1994). Sample sites within each reach were selected to include habitat types representative of the reach as a whole (Figures 2.3 – 2.6). The length of each sample unit was defined as twenty times the average stream width, with a minimum sample distance of 100 meters. Longer stream reaches were sampled more intensively than shorter reaches. Sample sites were also selected in each of the tributaries known to have spawning activity, regardless of whether channel type surveys had been completed. In these cases, sample sites were distributed evenly at approximately 1,500 meter intervals.

Sites were sampled in the summer to quantify the abundance and distribution of fishes during base flow conditions (June 26 – August 12). Trout populations were estimated using the removal-depletion method (Seber and LeCren 1967, Zippen 1958). Blocknets were placed at the upstream and downstream boundaries to prevent immigration and emigration. Each sample site was electrofished using the standard guidelines and procedures described by Reynolds (1983). Fish were collected by spot shocking using a Smith-Root Type VII pulsed-DC backpack electrofisher. Two electrofishing passes were made for each sample site. Salmonid species, including cutthroat trout, brook trout, and bull trout, were the target species for this study. Captured fish were identified, enumerated, measured (TL to nearest mm), and weighed. Cutthroat trout greater than 200 mm in length were tagged with a Floy FD-6B numbered anchor tag. Other species such as longnose dace, redside shiner, longnose sucker, and sculpin (sp.) were considered incidental catch and were only counted.

Population estimates were calculated using the following equation (Armour et al. 1983):

$$N = \frac{U_1}{1-(U_2/U_1)}$$

where:
N = estimated population size;
U_1= number of fish collected in the first pass; and
U_2= number of fish collected in the second pass.
The standard error of the estimate was calculated as:

$$se(N) = \sqrt{\frac{M(1-M/N)}{A-\left[(2p)^2(U_2/U_1)\right]}}$$

where:
se(N) = standard error of the population estimate;
M= $U_1 + U_2$;
A= $(M/N)^2$; and
p= $1-\frac{U_2}{U_1}$.

The population estimates were converted into density values (# fish/100 square meters) for each sample site then extrapolated to the reach in which the samples were collected. The confidence intervals were converted in the same manner. Total reach lengths were obtained from the digital data layer maintained by the Tribal GIS Program.

Age Analysis

Raw scales were used for age determination and calculating growth rates. Salmonid scales were taken from the side of the body just behind the dorsal fin and above the lateral line (Jearld 1983). Scale samples were sorted by watershed to allow for independent determination of age and growth rate. In the laboratory, several dried scales were mounted between two glass microscope slides and viewed using a Realist, Inc., Vantage 5 microfiche reader. Age was determined by counting the number of annuli (Lux 1971, Jearld 1983). Simultaneous to age determination, a measurement was made from the center of the focus to the furthest edge of the scale. Along this line, measurements were made to each annulus under a constant magnification. Annual growth was then back calculated using the Lee method as described by Carlander (1981). The formula used:

$$L_i = a + \left(\frac{L_c - a}{S_c} \right) S_i$$

where:

Li = Length of fish (in mm) at each annulus;
a = intercept of the body scale regression line;
Lc = length of fish (in mm) at time of capture;
Sc = distance (in mm) from the focus to the edge of the scale; and
Si = scale measurement to each annulus.

The intercept (a) was obtained from the linear regression of body length versus scale length at time of capture. The proportional method of back-calculation was used for species with small sample sizes due to poor regression results. The following equation was used:

$$L_i = \left(\frac{S_i}{S_c} \right) L_c$$

This formula does not take into account the size of fish at scale formation as does the Lee method. A linear regression of body length versus age was calculated independently for fish from each subject watershed and the resulting equation was used to determine the age of fish for which scale samples were not taken.

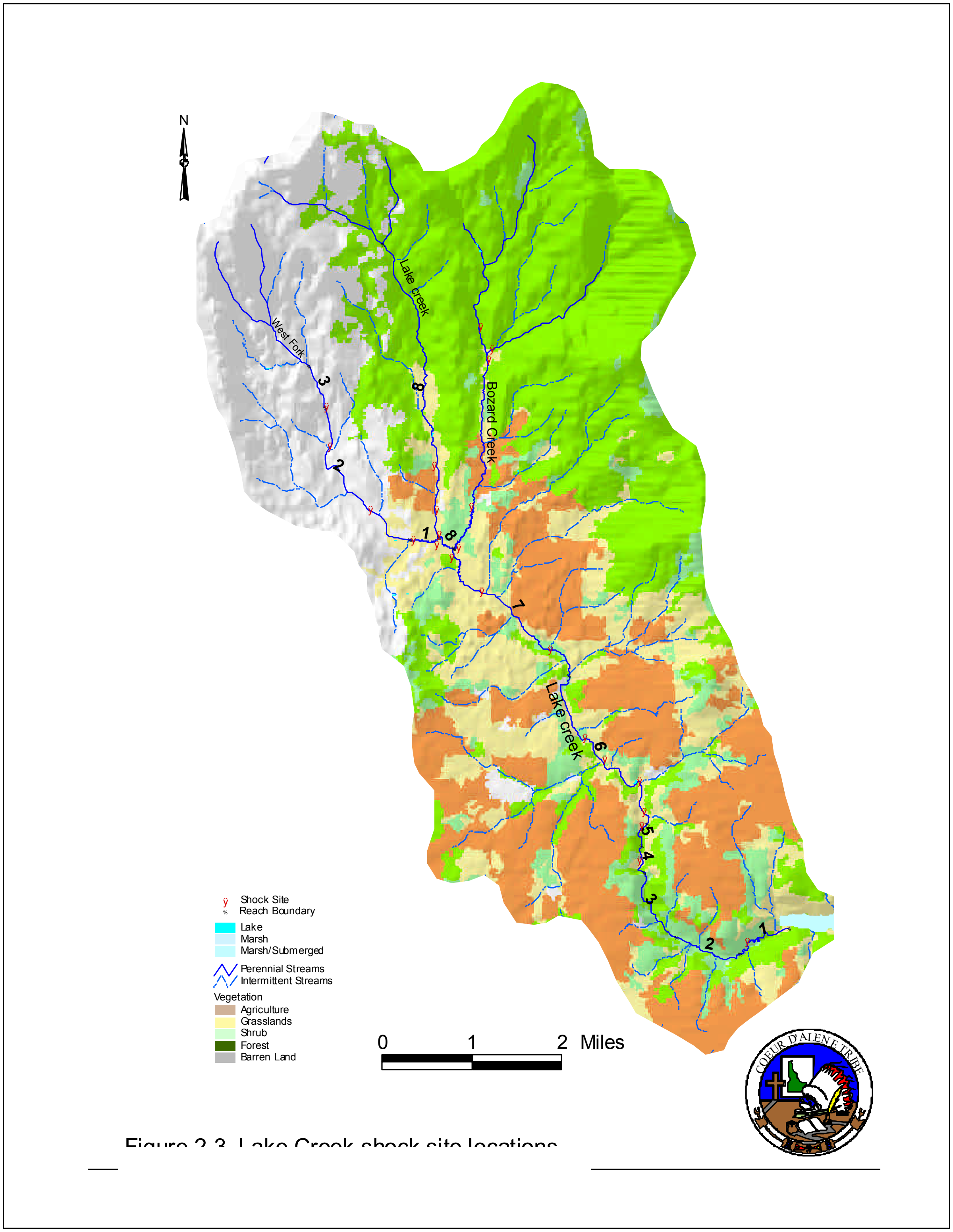


Figure 2.3 Lake Creek shock site locations.

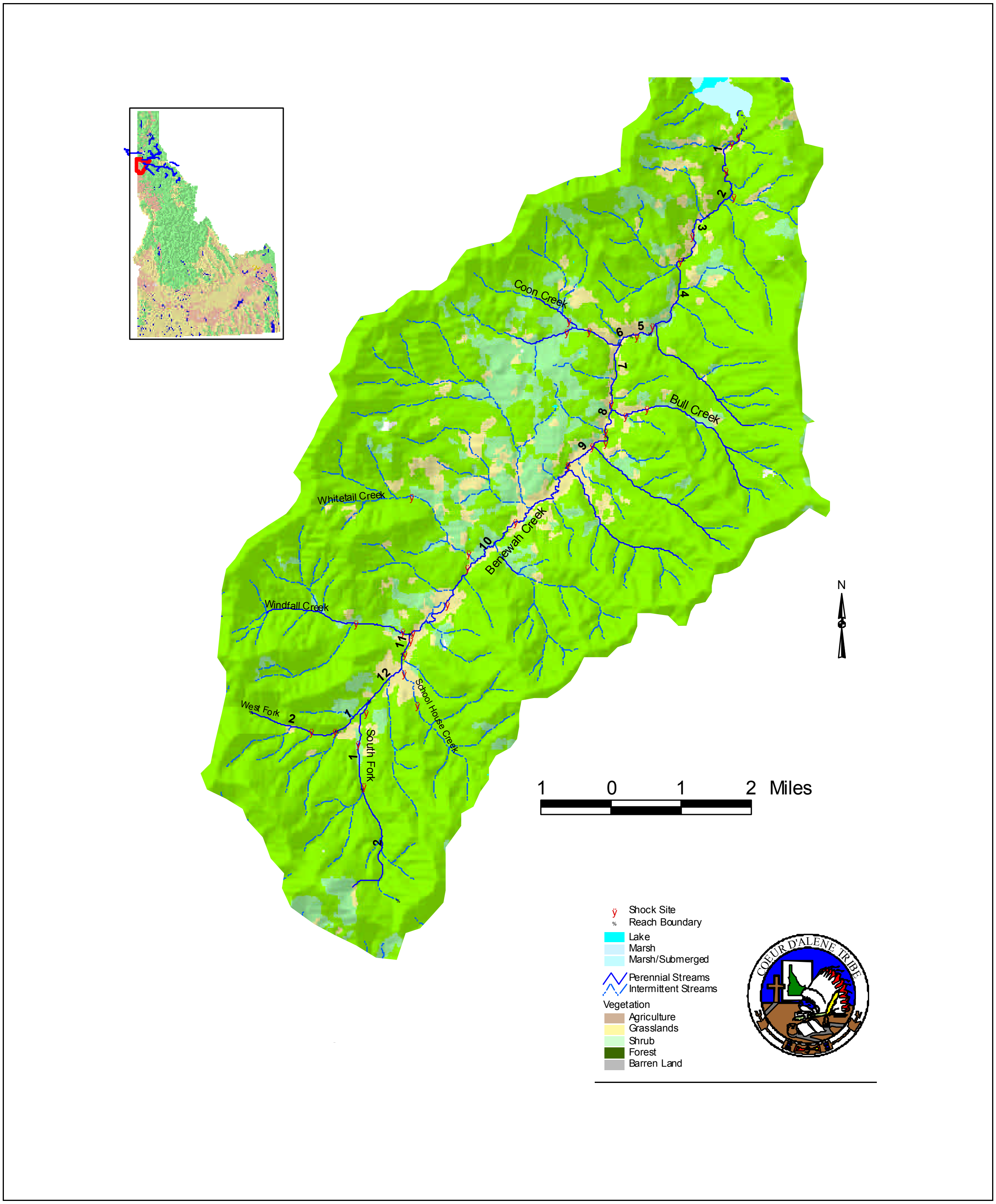


Figure 2.4 Benewah Creek shock site locations.

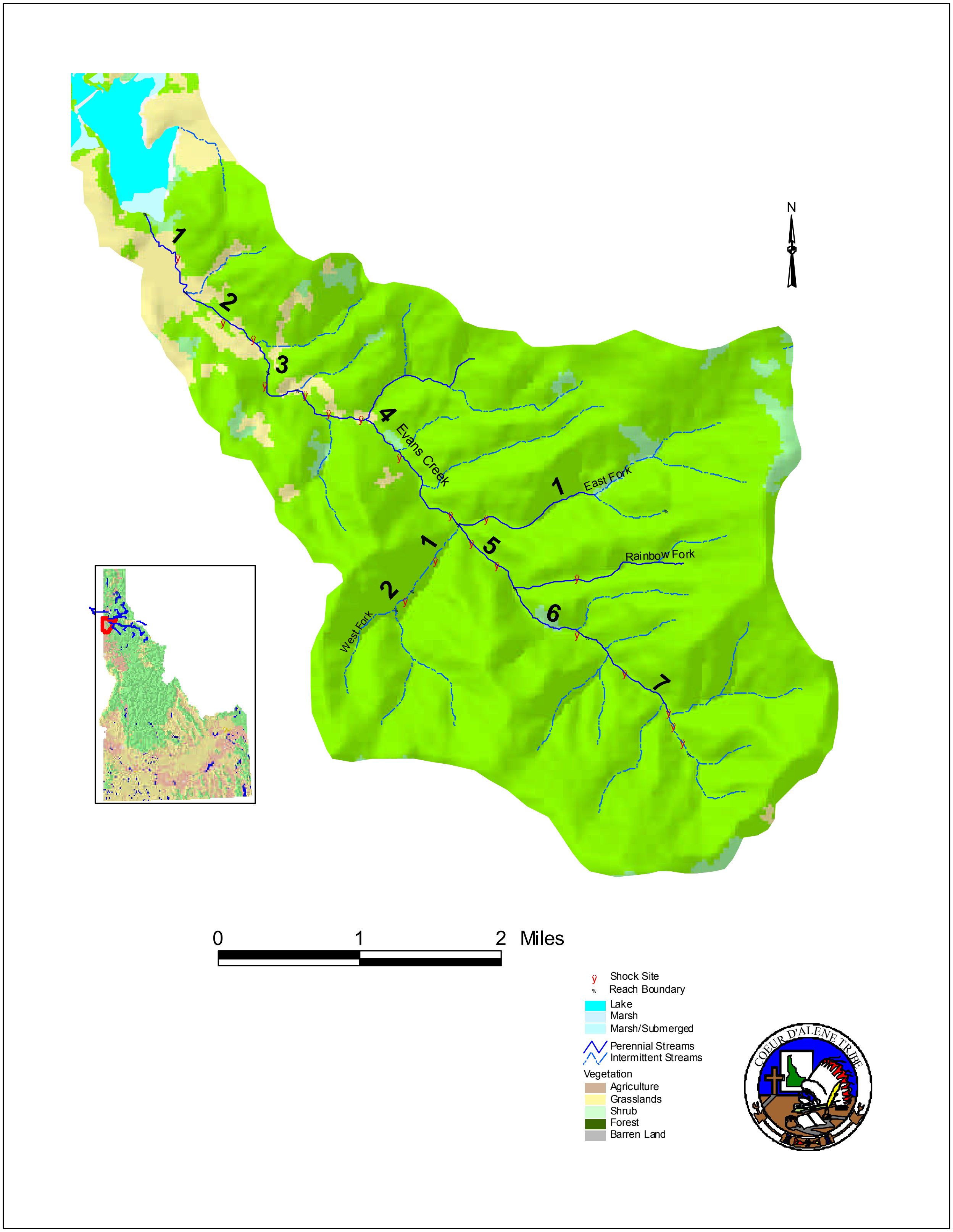


Figure 2.5 Evans Creek shock site locations.

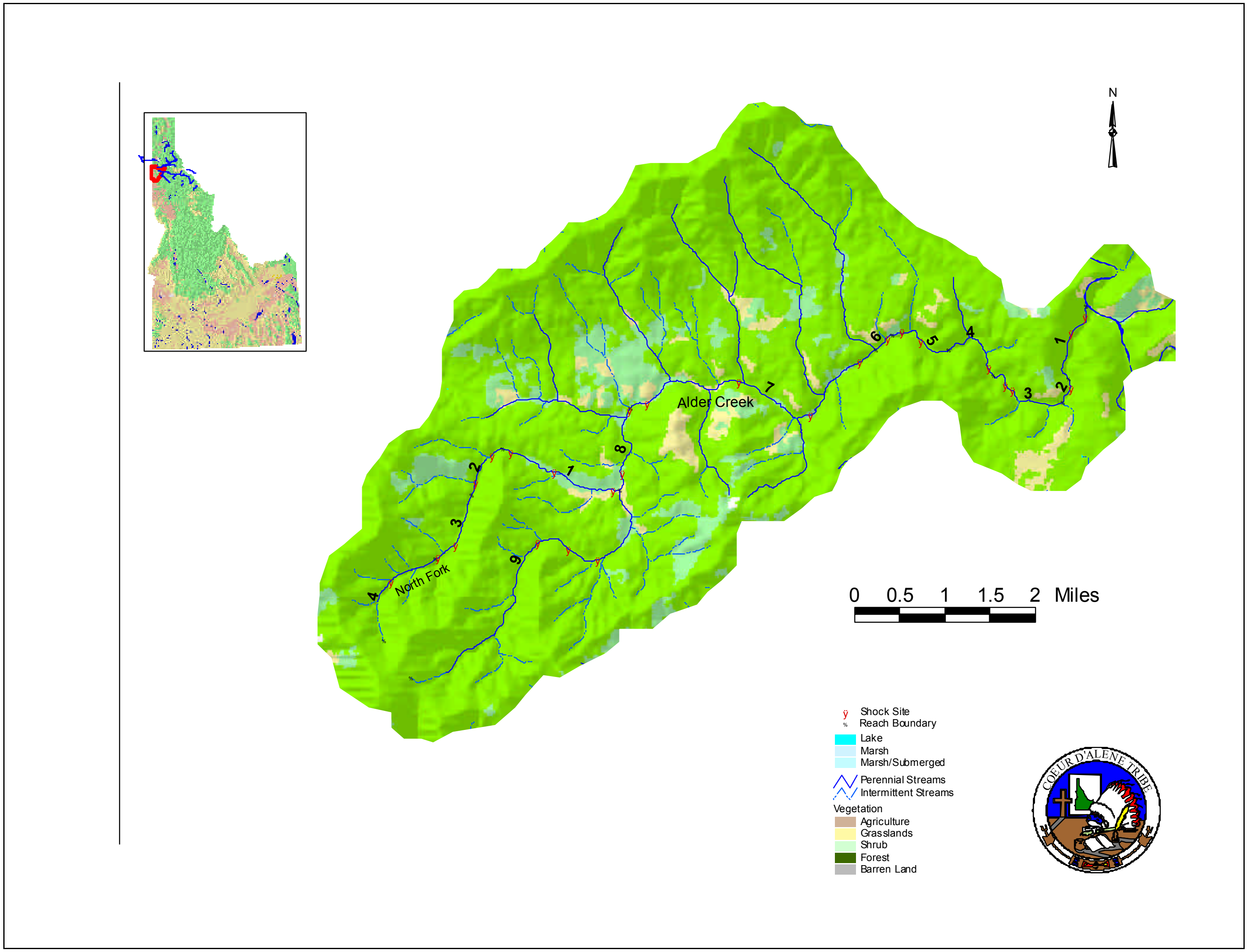


Figure 2.6 Alder Creek shock site locations.

Trout Migration

Migration traps were installed in Lake Creek, Benewah Creek and Cherry Creek to assess migratory patterns, reproductive cycles, distribution, and relative abundance. Traps were functional from March 24th – June 8th, 1996 and March 6th – June 5th, 1997, except during periods of high stream flow. The traps consisted of a weir, runway and a holding box. The design was a modification of the juvenile downstream trap found in Conlin and Tuty (1979). Traps were installed in pairs at some locations to allow monitoring of both upstream and downstream movements of fish (Table 2.3). Paired traps were placed approximately 20 meters apart.

Table 2.3 Fish trap locations in target watersheds, 1998.

Lake Creek	Benewah Creek	Evans Creek
At Hyw 95 crossing (p)	Mouth Benewah (p)	At mouth of creek
	Mouth W.F. Benewah	
	Mouth S.F. Benewah	
	Mouth Coon Creek	
	Mouth Whitetail Creek	
	Mouth Windfall Creek	

(p) Indicates a paired trap location.

Traps were checked at least once daily during peak spawning periods from mid-March through the middle of May and once daily afterwards until late June, when traps were removed. Fish captured in the traps were identified, counted, measured, and weighed. A scale sample was taken to assess the age, growth, and condition of the fish. Trap efficiency was calculated to allow for comparisons among years and was determined as catch per unit effort (CPUE), where one unit effort was defined as one 24-hour period.

3.0 Results

3.1 Lake Studies

3.1.1 Water Quality

Seven physical/chemical properties of water, two essential nutrients, and 11 dissolved metals were tested for on Coeur d'Alene Lake in 1997 and 1998 on a monthly basis. The testing program was directed primarily at the properties of water that most affected fish production and distribution within the lake. Vertical profiles were also taken for dissolved oxygen, temperature, pH and conductivity, using a multi-parameter water quality testing probe. Samples were taken on a bi-weekly basis during 1997 and 1998.

Dissolved Oxygen

Vertical profiles of dissolved oxygen were taken at each of the thirteen stations (Appendix A) during 1997 and 1998. Dissolved oxygen, when at low concentrations is an indication of high levels of organic decomposition. The surface water of every sampling station remained at acceptable levels (>6.0 mg/L) over the course of both years.

In 1997, four of the thirteen sampling stations showed dissolved oxygen concentrations of less than 6.0 mg/L in the hypolimnion, and in 1998, eight out of the thirteen water quality sites had dissolved oxygen concentrations below 6.0 mg/L in the hypolimnion (Table 3.1). Sites that were similar in geomorphology showed similar results in dissolved oxygen concentrations.

Table 3.1 Water quality stations on Coeur d'Alene Lake that had dissolved oxygen readings less than 6.0 mg/L in 1997 and 1998.

Location	Depth (m)	1997 Dissolved Oxygen (mg/L)	1998 Dissolved Oxygen (mg/L)
Hidden Lake	9	0.25	0.12
Chatcolet Lake Deep	11	0.50	0.10
Benewah Lake	5	1.25	0.14
Mid Lake	13	4.5	3.75
Conkling Point	16	-	2.78
Windy Bay Deep	32	-	5.68
Carey Bay	14	-	4.6
St. Joe River	13	-	5.75

During 1997 and 1998, the lowest dissolved oxygen concentrations were recorded in the shallow southern lakes stations. In 1997, the lowest dissolved oxygen concentrations were recorded in Hidden Lake, where a reading of 0.25 mg/L was recorded on ( ) in the lowest one meter of the lake. Dissolved oxygen concentrations in Hidden Lake were in violation of the 6.0 mg/L standard from 6.0 to 8.5 meters or the bottom from ( ). Chatcolet Lake Deep had the second lowest reading 0.50 mg/L on ( ) and was in violation of the 6.0 mg/L standard from 7 to 13 meters or the bottom from ( ). Benewah Lake was also in violation of the 6.0 mg/L standard in the bottom 1 meter with a reading of 1.25 mg/L on ( ). In 1998, Chatcolet Lake Deep had the lowest dissolved oxygen level at 0.10 mg/L on ( ). Dissolved oxygen values were below the 6.0 mg/L standard in the lower 2-4 meters from ( ). Hidden Lake had a reading of .12 mg/L on ( )and the lowest 1-2 meters were in violation of the 6.0 mg/L standard from ( ). Dissolved oxygen in Benewah Lake was in violation of the 6.0 mg/L standard in the bottom 1 meter with a reading of .14 mg/L on ( ).

During 1997, the only station found in violation of the 6.0 mg/L standard within the main body of Coeur d'Alene Lake was the Mid-Lake Coeur d'Alene station where the 6.0 mg/L standard was violated in the bottom 1 meter with a reading of 4.5 mg/L on ( ). This drop in the dissolved oxygen level is a general indicator of increasing trophic status or eutrophication. The general trend was an increase in trophic status on a north to south axis. However, the Conkling Point sample station, which is between Mid-Lake Coeur d'Alene and Hidden Lake, did not violate the 6.0 mg/L dissolved oxygen standard.

In contrast to 1997, all three sites in the open water zone during 1998 had dissolved oxygen concentrations below 6.0 mg/L. Conkling Point had a dissolved oxygen reading of 2.78 mg/L on ( )and the lower 2 to 3 meters had dissolved oxygen levels below the 6.0 mg/L standard from ( ). Mid-Lake Coeur d'Alene was in violation of the 6.0 mg/L standard with a reading of 3.75 mg/L in the lower 1 to 4 meters on ( ). Windy Bay Deep had only one day ( ) where the dissolved oxygen dropped below 6.0 mg/L and it was in the lower 4 meters.

During 1998, Carey Bay was the only interior bay site in which dissolved oxygen values dropped below 6.0 mg/L. A value of 4.6 mg/L was recorded in the lower 1 meter on ( ).

In 1998, the St. Joe River had a dissolved oxygen reading of 5.75 mg/L on ( ).

By October of 1998 all but two sites were isothermal with dissolved oxygen values greater than 8.0 mg/L. Windy Bay Deep and Mid- Lake Coeur d'Alene were the only two sites that had not turned over at this time. Turn over is when the thermocline begins to weaken and the epilimnion increases in depth as it decreases in temperature. The stratified structure is lost and the lake becomes homothermous; that is, it has a uniform temperature from surface to bottom.

Temperature

Optimum temperature requirements for cutthroat and bull trout range between 10° C to 15° C. Vertical profiles of temperature were taken at all thirteen stations during both years (Appendix A). Geomorphologically similar stations showed similarities in the temperature profiles in both timing of stratification and magnitude of the warming. Shallow stations heated up sooner than deeper water stations. The shallow southern lakes had more variability in the timing and magnitude of the change when compared to the other sample stations (Peters et al. 1999).

In 1997, the shallowest stations, (Round Lake and Chatcolet Lake Shallow @1.5m deep), the epilimnion extended to the bottom before May 16th (Figure 3.1). Temperatures greater than the 15.0° C temperature standard existed from July 8th through September 29th from surface to bottom. The temperature peaked at 26.5° C on August 8th.

In 1998, Round Lake and Chatcolet Lake Shallow (Figure 3.1) had temperatures above 15° C from June 22nd through September 17th, and the epilimnion extended to the bottom. Round Lake had its warmest temperature of 23.86° C on August 11th and Chatcolet Lake Shallow reached a high of 26.62° C on July 21st.

In 1997, the shallow southern lake stations (Chatcolet Lake Deep, Benewah Lake, and Hidden Lake) the thermocline was present by May 16th (Figure 3.2) and reached its deepest point on September 17th. The temperature peaked at 26.5° C on August 8th.

In 1998, the thermocline varied between the three shallow southern lakes (Figure 3.2). By June 22nd the thermocline was in place at Hidden Lake and the upper 3.5 meters had temperatures above 15° C. The temperature peaked on August 11th with a surface reading of 25.06° C. Chatcolet Lake Deep had temperatures above 15° C on June 8th with a well-established thermocline. Peak temperature was reached on July 21st with a reading of 25.45° C at the surface. Benewah Lake had exceeded the optimum temperature requirements by May 21st in the upper 2 meters. A thermocline was established at this time. Peak temperature was reached on July 21st with a value of 25.92° C at the surface.

Vertical profiles for the interior bay stations (Windy Bay Shallow, Rockford Bay, and Carry Bay) during 1997 showed that the thermocline had started to build in by May 16th and the water nearest to the bottom had warmed from 5.5° C to 7.0° C (Figure 3.3). By June 26th the thermocline had reached the bottom. The surface temperature peaked on August 5th at 23.5° C.

During 1998, all three interior bays sample sites had temperatures above 15° C (Figure 3.3) and a well-established thermocline by June 8th. Temperature in the interior bays peaked at 24.79° C on July 7th.

Temperature profiles for the 1997 deep-water stations (Conkling Point, Windy Bay Deep, Mid-Lake Coeur d'Alene) showed a definite thermocline by May 16th (Figure 3.4) with complete thermal stratification by August 5th. The thermocline was still present in the deepest sampling station on October 22nd however; it was nearly broken down in the other two deep-water stations. The temperature criterion was never exceeded from surface to bottom however, the temperature standard was exceeded and habitat was limited.

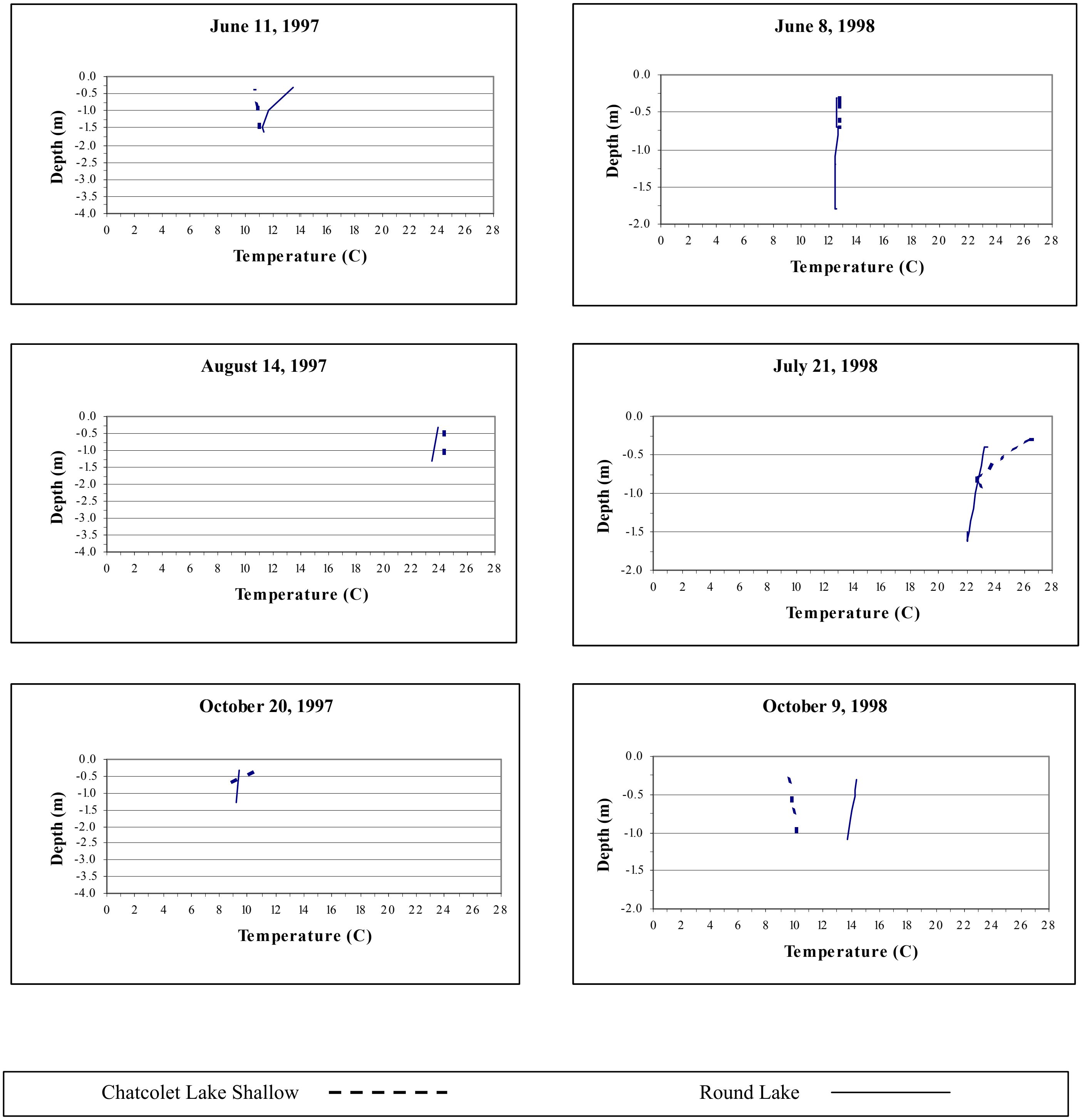


Figure 3.1 Peak spring, summer and fall temperature profiles vs. depth for two geomorphology similar sampling locations on Coeur d'Alene Lake during 1997 and 1998.

By June 8th 1998, the deep water zones had temperatures that violated the standards and had well-established thermoclines (Figure 3.4). The depth of the thermoclines varied by site, Conkling Point's extended down 1.5 meters while Mid-Lake Coeur d'Alene's consisted of the upper 3 meters and Windy Bay Deep had the most pronounced thermocline, which encompassed the upper 8.5 meters. Peak temperature was reached on July 7th with a reading of 24.51° C.

In 1997, Coeur d'Alene River's water temperature had exceeded 15° C by June 11th and a thermocline was forming (Figure 3.5). Water temperature peaked on August 5th (25.18° C) and the surface to bottom temperature was greater than 15° C. In 1998, water temperature in the Coeur d'Alene River had exceeded 15° C by June 8th (Figure 3.5). Maximum water temperature was reached on August 10th (24.59° C).

By July 8th 1997 the water temperature in the St. Joe River had exceeded 15° C (Figure 3.6). Water temperature peaked in the St. Joe River on August 5th with a reading of 23.01° C. In 1998, the St. Joe River exceeded 15° C by June 22nd in the upper 2 meters (Figure 3.6). Peak temperature was reached on July 21st (22.77° C).

In 1997, by the first of October all water quality sites were isothermal at 15° C. By mid October in 1998 water temperature at all thirteen stations was between the optimum temperature requirement of 10° C to 15° C.

pH

Cutthroat and bull trout have optimum pH limits of 6-8. The pH of Coeur d'Alene Lake does not change very much from season to season or on an annual basis. Observed values ranged from 6.8 to 8.0 (Appendix A), all within the optimal tolerance limits for cutthroat production.

In 1997, the only variation occurred at three stations in the southern lakes section (Chatcolet Lake Deep, Benewah Lake, and Hidden Lake) where the pH rose to 9.4 (Figure 3.7) in the upper 2 meters of the water column. The three stations that showed similar changes in pH were in geomorphologically similar areas.

During 1998, eleven out of the thirteen sites had pH values that exceeded the upper limit. pH values increased on a north to south axis as did the duration. The interior bays and the deep-water zones had pH values that exceeded eight from June 24th through July 8th. The shallow southern lakes had pH values above eight from July 7th through September 3rd. The peak pH during this time was 9.17 on August 11th (Figure 3.7). On October 9th and 19th Round Lake exceed the upper pH limit with a reading of 8.63. Chatcolet Lake Shallow exceeded the upper pH limit on and off from July 7th through October 19th, with the maximum pH being 9.36 on October 19th (Figure 3.8).

Conductivity

Vertical profiles of the specific conductance were taken concurrently with the other physical/chemical parameters during 1997 and 1998 (Appendix A). In 1997, all conductivities were within the tolerance limits for cutthroat trout production and ranged from 15.3 µg/L to 81.0 µg/L. Any variability to the conductivity was due to natural environmental conditions except at the mouth of the Coeur d'Alene River (Figure 3.9) where higher than normal levels of dissolved metals are flowing into the lake. Values remained very stable during the fall, winter, and spring months. Only during the peak summer conditions did variation occur.

In 1998, all thirteen water quality sites fell with in the conductivity limits. The shallow southern lakes and Coeur d'Alene River had the highest values. Hidden Lake (129.1µs/cm), Chatcolet Lake Deep (92.6µs/cm), Benewah Lake (75.7µs/cm) and the Coeur d'Alene River (85µs/cm). The rest of the sites had values ranging from 30-65 µs/cm.

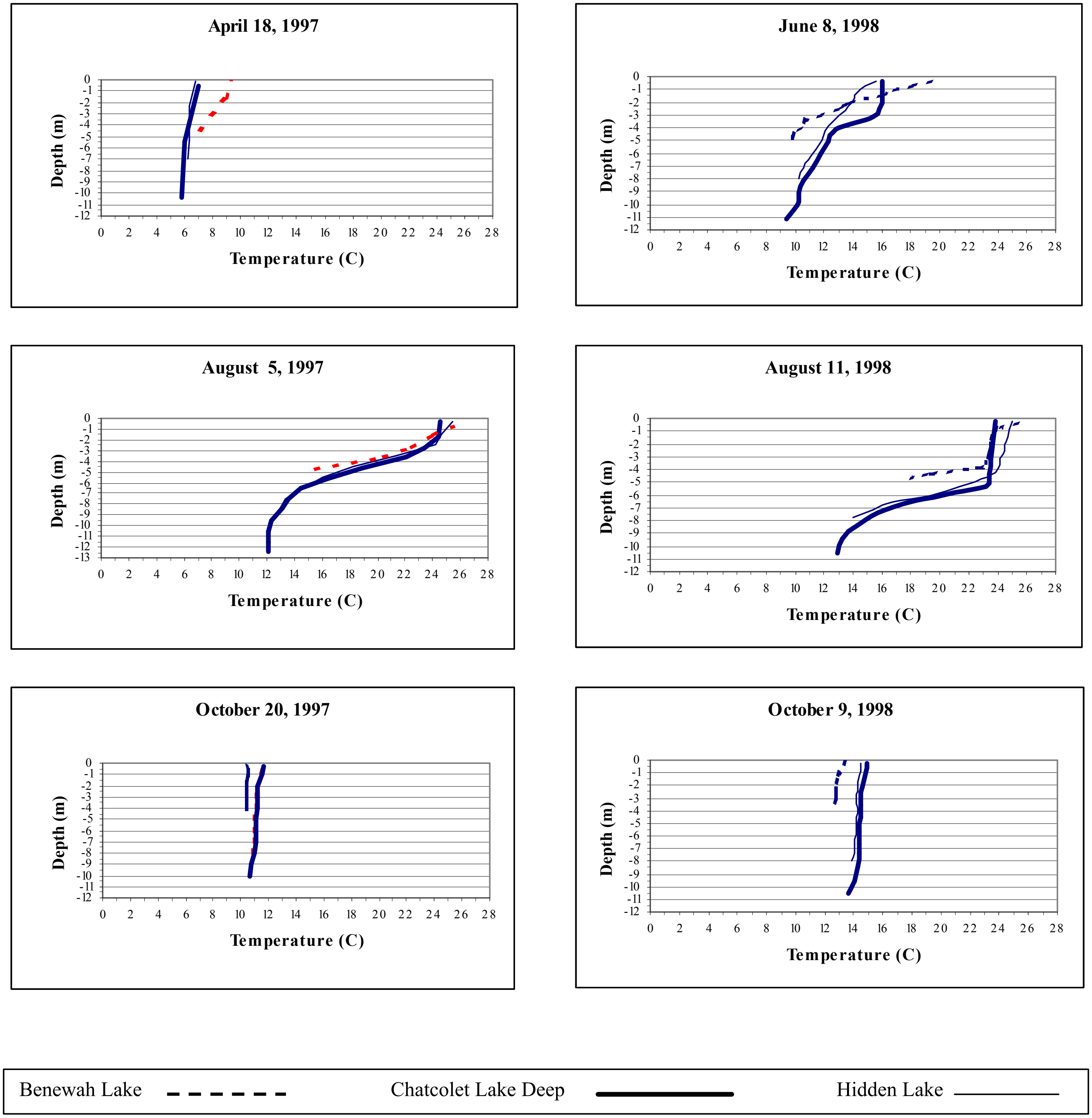


Figure 3.2 Peak spring, summer and fall temperature profiles vs depth for three geomorphology similar sampling locations on Coeur d'Alene Lake during 1997 and 1998.

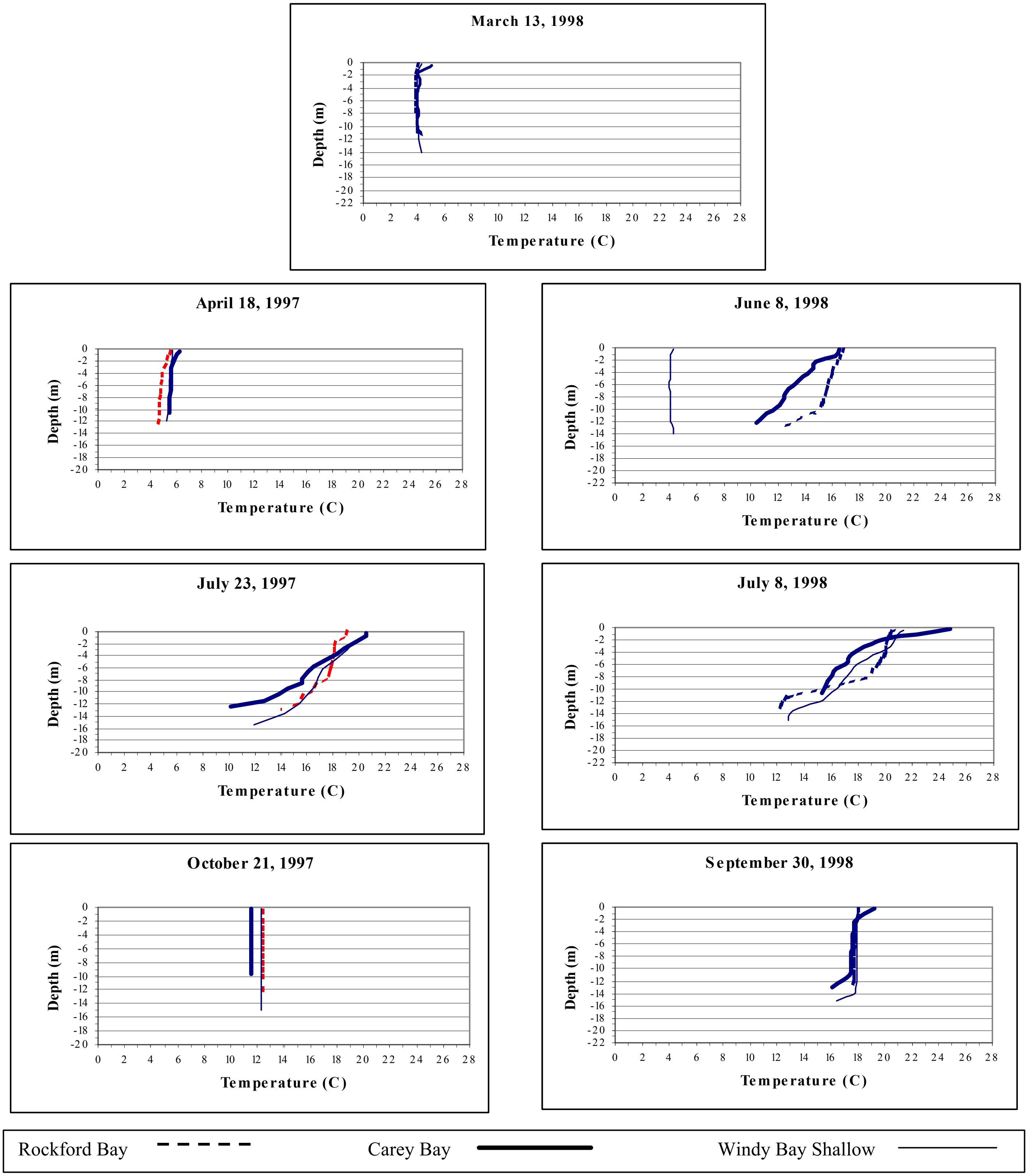


Figure 3.3 Peak winter, spring, summer and fall temperature profiles vs depth for three geomorphology similar stations on Coeur d'Alene Lake during 1997 and 1998. A winter sample was not taken in 1997.

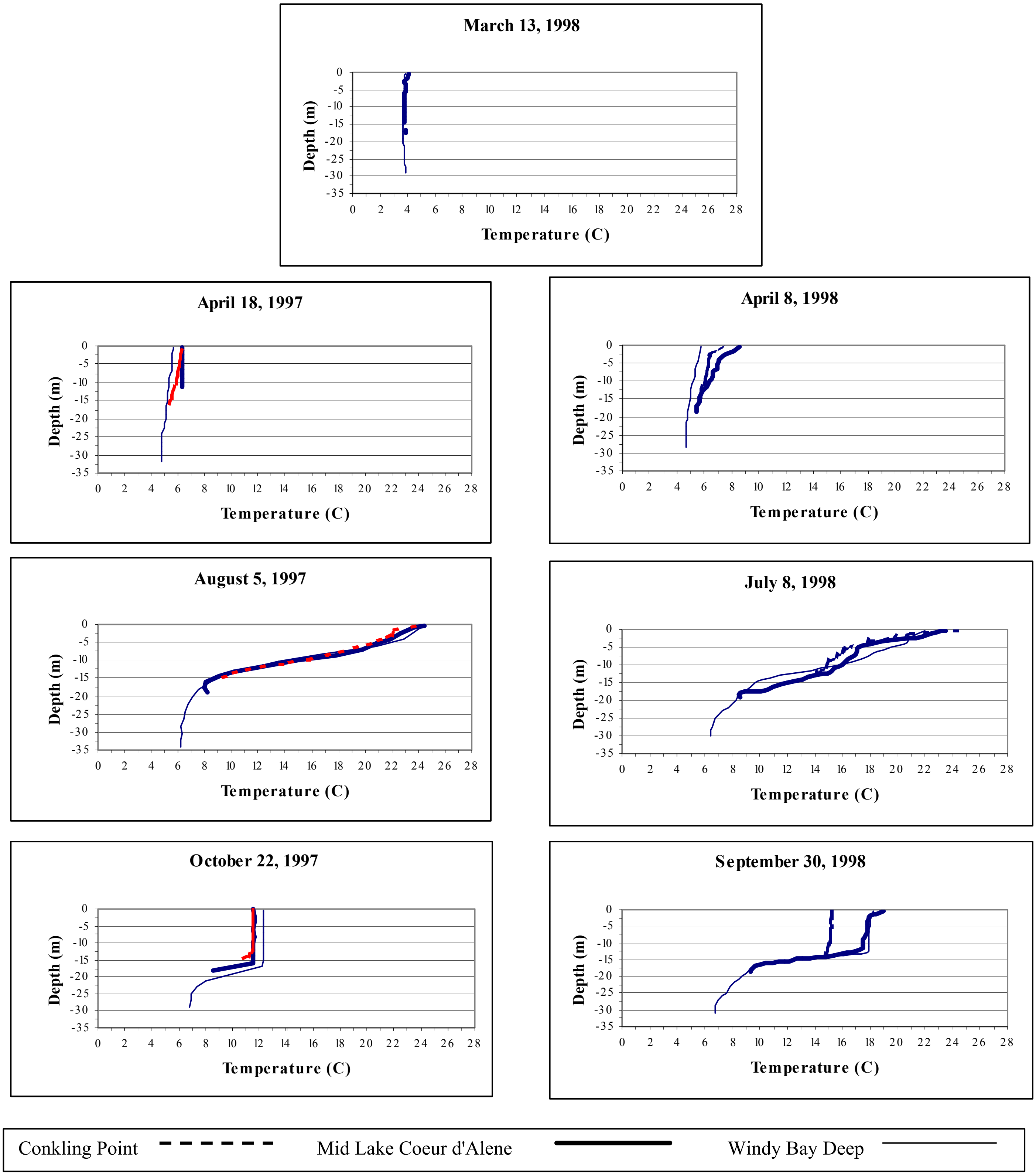


Figure 3.4 Peak winter, spring, summer and fall temperature profiles vs depth for three geomorphology similar sampling locations on Coeur d'Alene Lake during 1997 and 1998. A winter sample was not taken in 1997 and Conkling Point had no winter sample taken in 1998.

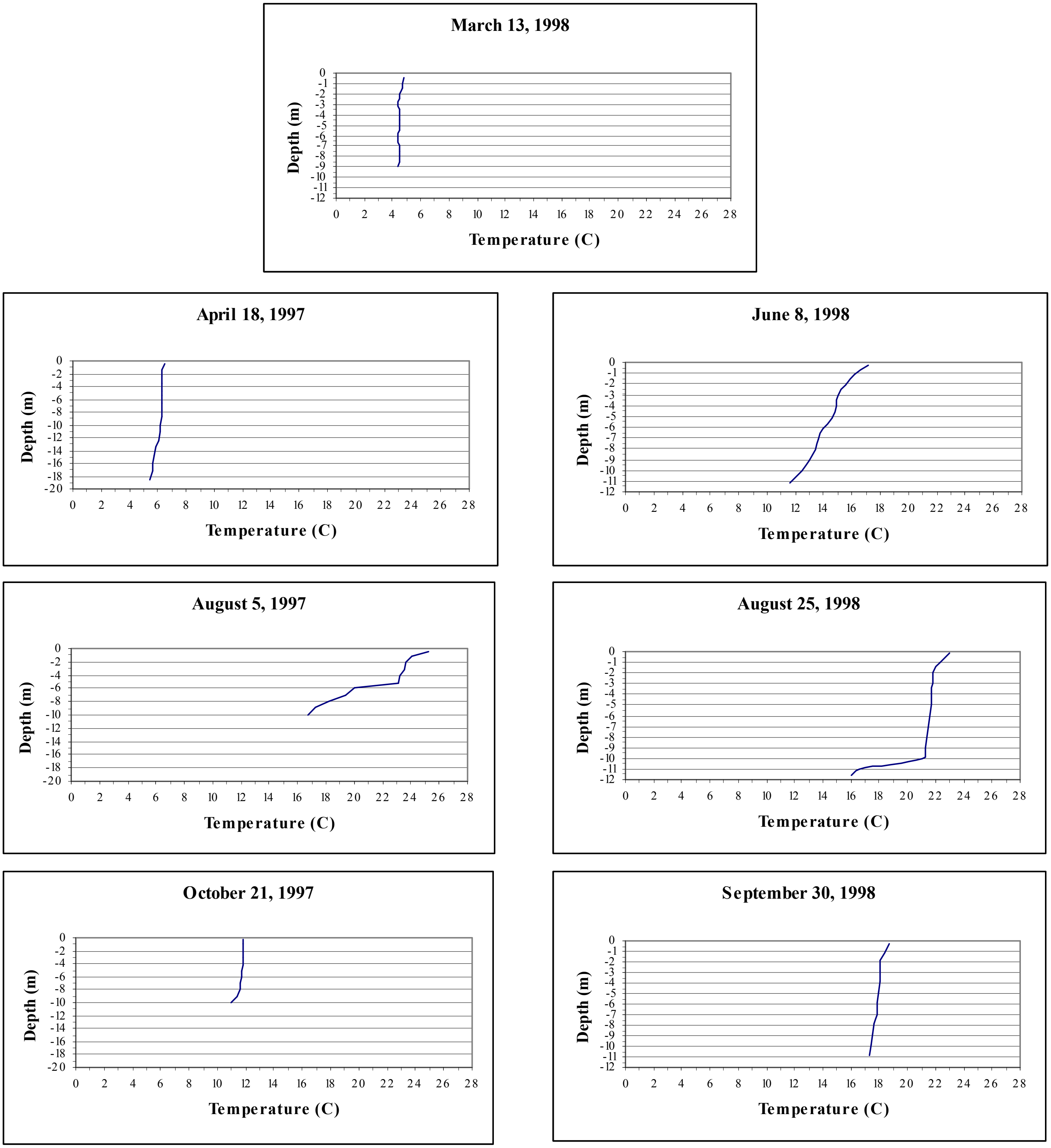


Figure 3.5 Peak winter, spring, summer and fall temperature profiles vs depth for the Coeur d'Alene River sampling location on Coeur d'Alene Lake during 1997 and 1998. There was no winter sample taken in 1997.

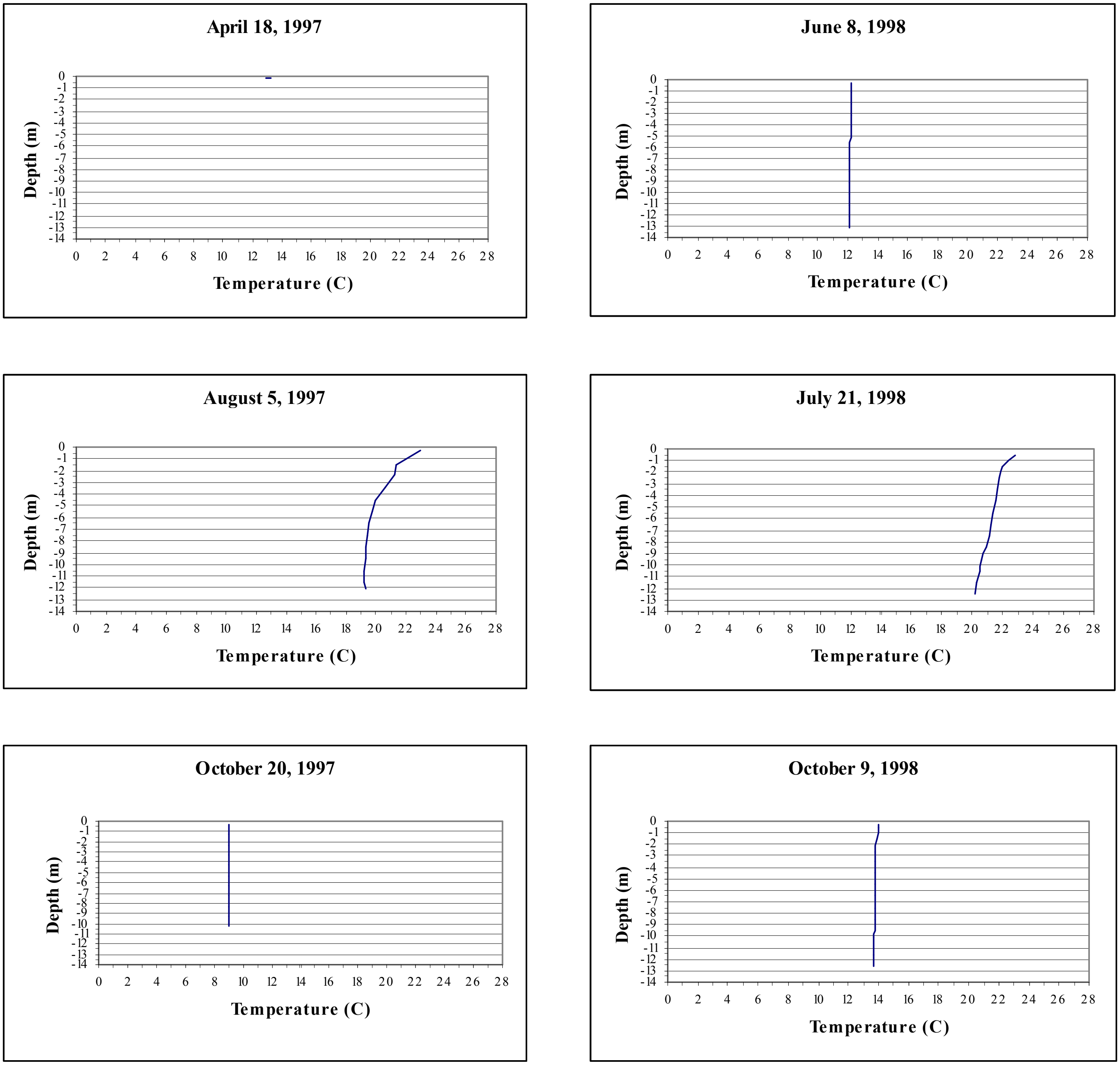


Figure 3.6 Peak spring, summer and fall temperature profiles vs depth for the St. Joe River sampling during 1997 and 1998.

Nitrogen
Nitrogen compounds follow regular seasonal patterns. For the most part nitrate concentrations sampled at the 13 stations (Appendix B) in 1997 and 1998, were below the detection limit (0.01 µg/L) thus, all data below detection limits were reported as half the detection limit. In only a few instances during 1997 (both stations in Windy Bay, Rockford Bay, and the two shallow stations) did nitrate concentrations exceed the detection limit in the epilimnion, reaching a high of 0.113 µg/L at the Rockford Bay sample station in the October sample period. However, in the hypolimnion concentrations of nitrate generally increased in the November sample over the October sample period reaching a high of 0.131 µg/L in the Windy Bay Deep sample station.

In the epilimnion during the months of April and November in 1998 half of the sites were above the detection limit. From June through October all sites were below the detection limit. Hidden Lake (0.210 µg/L) had the highest reading. In the hypolimnion, four out of the seven sampling months had values above the detection limit. Mid-Lake Coeur d'Alene (0.078 µg/L) had the highest reading in the hypolimnion.

Nitrite, the form of nitrogen found in the smallest quantities were all below the detection limit of 0.01 µg/L in the epilimnion and hypolimnion for both samples (Appendix B) at all thirteen stations in 1997. All data measured below the detection limit were recorded as half the detection limit.

During the sample months of April and June in 1998, nitrite values were <0.029 µg/L in both the epilimnion and hypolimnion (Appendix B). The rest of the time the values were below the detection limit. All data measured below the detection limit were recorded as half the detection limit.

Organic nitrogen is defined functionally as organically bound nitrogen in the tri-negative oxidation state. Analytically, organic nitrogen and ammonia can be determined together and have been referred to as "kjeldahl nitrogen", a term that reflects the technique used in their determination. Total kjeldahl nitrogen was added as a new water quality sampling method during the 1998 field season. The values in both the epilimnion and hypolimnion were fairly uniform throughout the thirteen stations (Appendix B).

Phosphate
During 1997 and 1998, ortho-phosphate concentrations were below the detection limit (0.026 µg/L) at all sites in both the epilimnion and hypolimnion (Appendix B). The data were reported as half of the detection limit so data point loss would not occur.

Total phosphorus was a new parameter that was added in 1998. Total phosphorus values increased on a north to south axis (Appendix B). All sites north of Hidden Lake in both the epilimnion and hypolimnion were below the detection limit of 0.005 µg/L. All data measured below the detection limit were recorded as half the detection limit. A few sites south of Hidden Lake had values slightly higher than the detection limit. Values in the epilimnion ranged from <0.005 µg/L in the northern sites to 0.065 µg/L at Chatcolet Lake Shallow. In the hypolimnion the values ranged from <0.005 µg/L in the northern sites to 0.026 µg/L at Benewah Lake.

Primary Productivity
$Chlorophyll_a$ is the pigment aquatic plants use for photosynthesis. In 1997 $Chlorophyll_a$ values ranged from 0.005 µg/L to 25.790 µg/L in the epilimnion while values ranged from 0.005 µg/L to 34.14 µg/L in the hypolimnion (Appendix B). The general trend is increasing values on a north to south axis. Higher levels of $chlorophyll_a$ is an indicator of increasing trophic status.

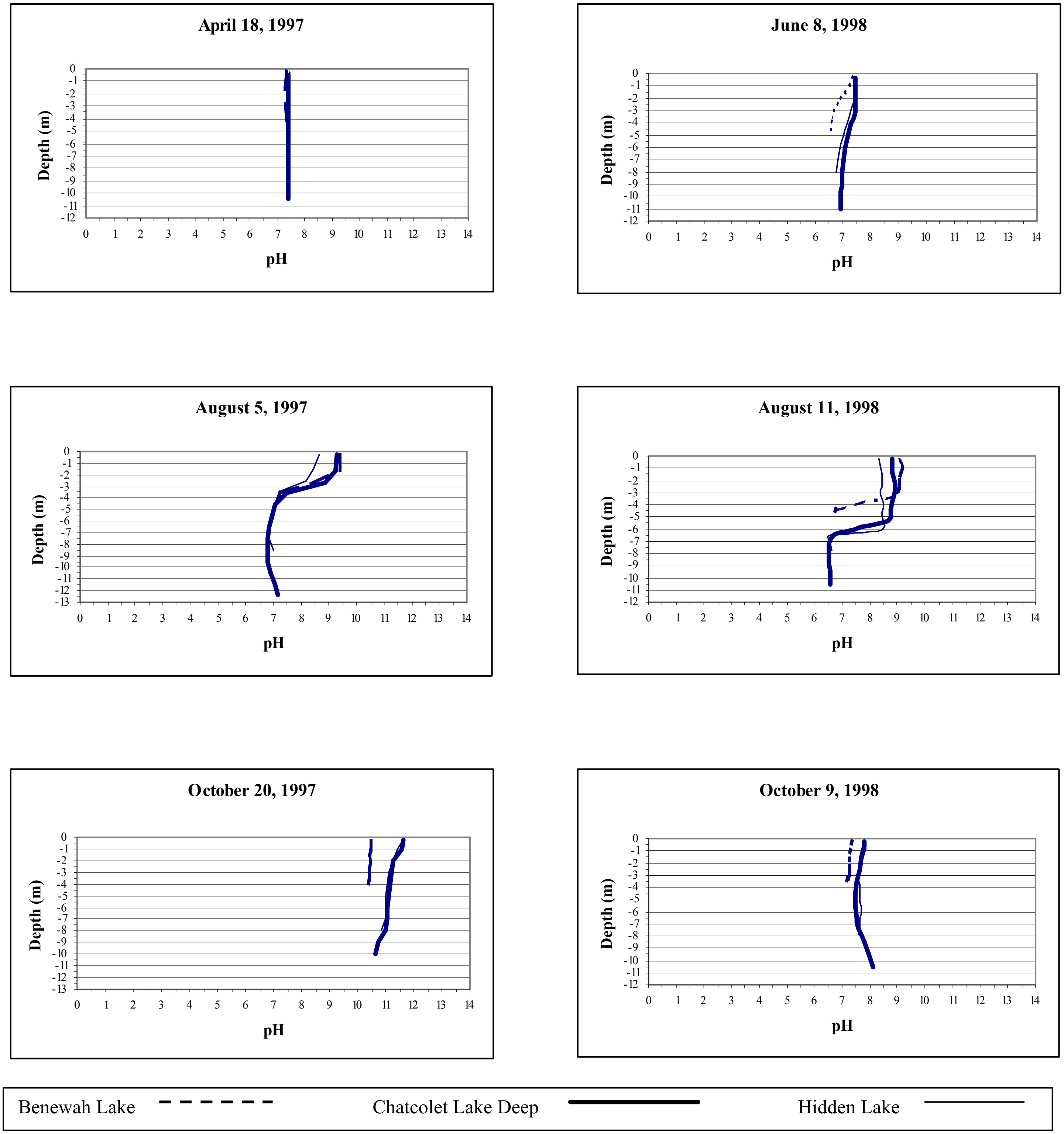
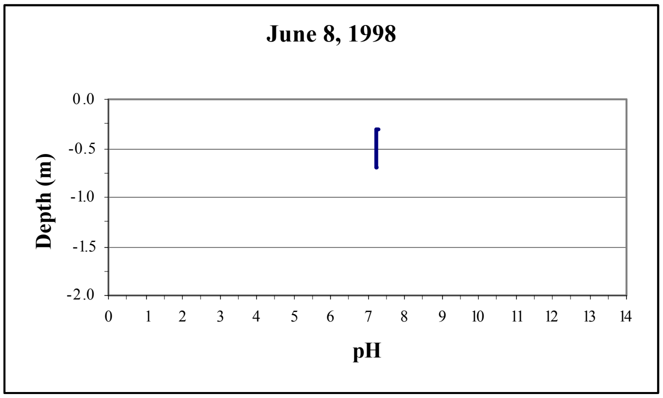
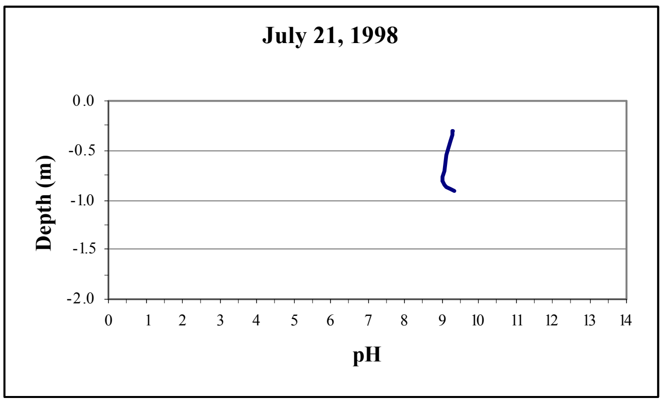


Figure 3.7 Peak spring, summer and fall pH profiles vs depth for three geomorphology similar sampling locations on Coeur d'Alene Lake during 1997 and 1998.





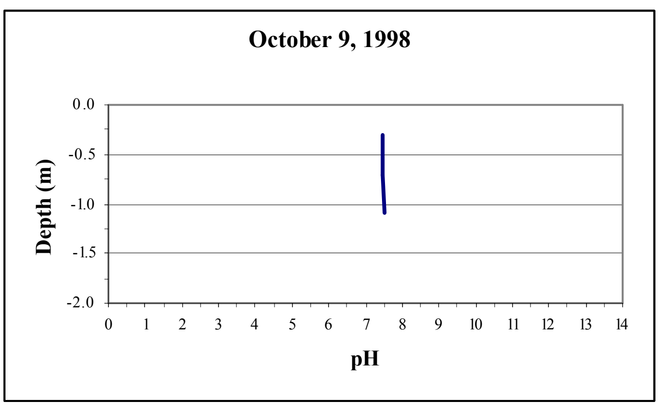
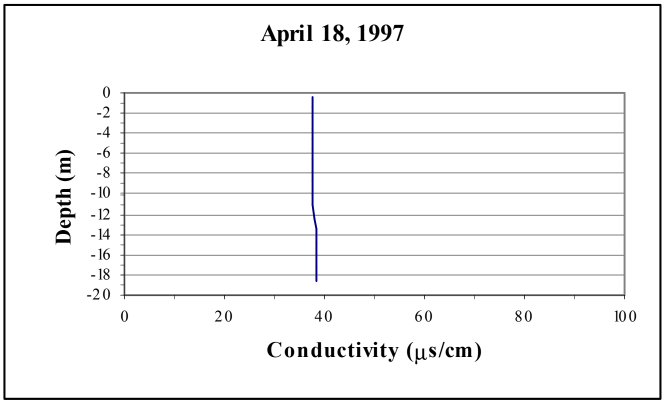
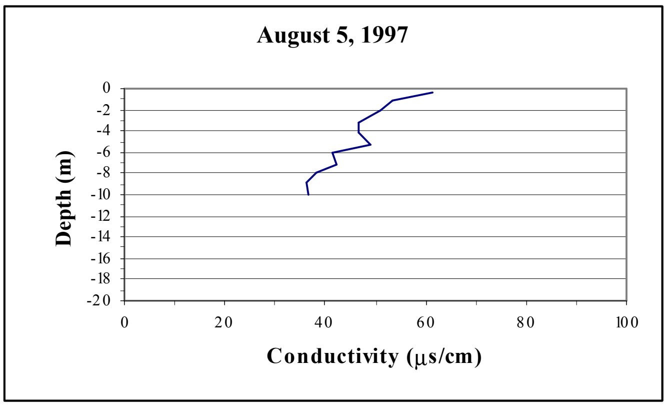


Figure 3.8 Peak spring, summer and fall pH profiles vs depth for the Chatcolet Lake Shallow sampling location on Coeur d'Alene Lake during 1998.





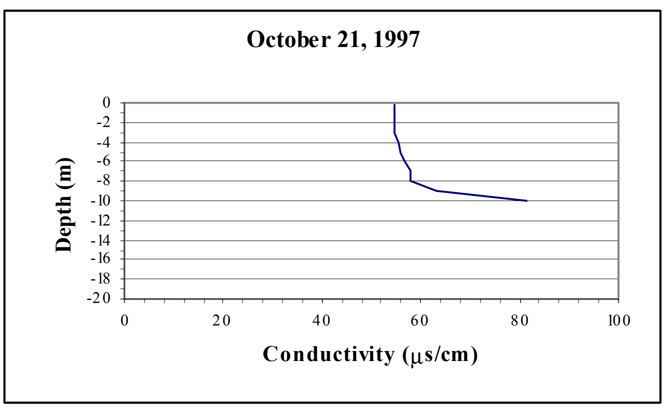


Figure 3.9 Peak spring, summer and fall conductivity profiles vs depth for the Coeur d'Alene River sampling location on Coeur d'Alene Lake during 1997.

In 1998, the same trend occurred as in 1997, Chlorophyll$_a$ values increased on a north to south axis. The values in the epilimnion ranged from <0.001 µg/L to 61.410 µg/L and the values in the hypolimnion ranged from <0.010 µg/L to 80.920 µg/L (Appendix B).

Physical
Total Suspended Solids (TSS) is defined as the residue left on a filter paper of 2 µm or smaller after a portion of the sample has been filtered through (APHA, 1992). The detection limit for TSS is 4.0 mg/L. In 1997, total suspended solids were fairly uniform throughout the epilimnion of the lake with only a few differences found (Appendix B). The shallow stations ran slightly higher than the other stations with Round Lake reaching a high of 16.0 mg/L. The southern lakes also ran slightly higher with Hidden Lake and Benewah Lake reaching a high of 10 mg/L. The hypolimnion was quite variable throughout the lake. Windy Bay Deep reached a high of 27.0 mg/L. Drinking water standards are set at 500 mg/L however; levels much lower can impart a foul taste to the water. No analysis of the composition of the suspended solids was completed. However, it was noted that high levels of suspended sediment was present in the southern lakes sample stations and that most likely the high suspended solids present in the Windy Bay Deep station was related to decomposing algae not sediment.

During 1998, none of the water quality sites exceeded the drinking water standard but some sites did exceed the detection limit (Appendix B). Chatcolet Lake Shallow had a high reading of 10.500 mg/L in the epilimnion. TSS increased in the hypolimnion, with more sites having values over 4.0 mg/L. The southern lakes had some of the highest values. Chatcolet Lake Deep had a reading of 141.000 mg/L in June and Hidden Lake had a reading of 47.000 mg/L in April.

Turbidity is the amount of suspended inorganic and organic matter throughout the water column. In 1997, turbidity in the epilimnion and hypolimnion showed the same trend as suspended solids (Appendix B) with a general increase on a north to south axis. The highest turbidity reading was recorded at the Chatcolet Lake Shallow sample station (11.2 NTU). The next highest was Benewah Lake (5.810 NTU) followed by Hidden Lake (4.760 NTU). The lowest value was recorded at the Windy Bay Deep sample station (0.230 NTU). The high turbidity readings were due to suspended sediments flowing in from Plummer Creek a tributary to Chatcolet Lake.

In 1998, all of the turbidity readings in the epilimnion were above the detection limit (Appendix B). Benewah Lake (6.840 NTU) had some of the highest readings throughout the season. Windy Bay Deep (0.403 NTU) had the lowest turbidity reading. Turbidity values were higher in the hypolimnion than in the epilimnion. In June Chatcolet Lake Deep had a reading of 43.100 NTU. Windy Bay Deep (0.335 NTU) had the lowest turbidity value. As the field season continued there was a gradual decrease in turbidity values in the hypolimnion.

Dissolved Metals
Little variation in the concentrations of the eleven metals (Appendix B) sampled was observed during 1997 and 1998. Potassium (K) values in the hypolimnion during October of 1998 were slightly higher than October of 1997. The 1998 values ranged from 1.02 mg/L to 1.4 mg/L compared to 1997, which had values that were <0.850 mg/L.

Secchi disk readings were taken at each of the thirteen stations throughout 1997 and 1998 they were used to determine the euphotic zone depth. Graphs showing the measured secchi disk readings and the empirically derived euphotic zone depth are located in (Appendix C). In 1997 and 1998 the empirically derived euphotic zone depth was variable throughout the lake (Table 3.2 & 3.3) with each station having different depths based on variable site-specific conditions. Similarities existed between the five distinct habitat areas however; the general trend was decreasing secchi and euphotic zone depths on a north to south axis within the lake.

Table 3.2 Average annual and seasonal secchi measurements taken at thirteen stations on Coeur d'Alene Lake in 1997. Euphotic zone depths were empirically derived using the regression equation EZD=2.2302+1.4914(SD)R^2=.78 published by Alaska Fish and Game 1987. All measurements are in meters.

		Average		Spring		Summer		Fall	
Location	Station Depth	Annual Secchi[a]	Annual Euphotic Zone	Seasonal Secchi[b]	Seasonal Euphotic Zone	Seasonal Secchi[c]	Seasonal Euphotic Zone	Seasonal Secchi[d]	Seasonal Euphotic Zone
Round Lake	1.50	1.27	Bottom (1.5)[e]	1.20	Bottom (1.5)	1.31	Bottom (1.5)	1.23	Bottom (1.5)
Chatcolet Shallow	1.50	.89	Bottom (1.5)	1.00	Bottom (1.5)	0.87	Bottom (1.5)	0.77	Bottom (1.5)
Rockford Bay	13.00	5.29	10.11	153	4.50	6.43	11.81	7.63	13.61
Windy Bay Shallow	14.00	4.58	9.05	1.66	4.71	5.37	10.24	6.60	12.07
Carey Bay	12.00	4.10	8.34	1.73	4.80	5.13	9.87	4.87	9.48
Windy Bay Deep	33.00	5.44	10.35	1.75	4.84	6.77	12.33	7.27	13.07
Mid Lake	18.00	4.08	8.31	1.74	4.82	5.00	9.68	5.03	9.73
Conkling Point	16.00	3.44	7.36	1.43	4.36	4.16	8.43	4.47	8.89
Hidden Lake	8.00	3.02	6.81	1.58	4.65	3.94	8.18	2.80	6.48
Chatcolet Lake	11.50	2.56	6.04	1.65	4.69	3.01	6.73	2.70	6.26
Benewah Lake	4.50	2.42	5.84	1.60	4.62	2.96	6.64	2.20	5.51
Coeur d'Alene River	10.00	3.92	8.08	1.50	4.47	4.73	9.28	5.27	10.08
St. Joe River	12.50	2.25	5.58	1.08	3.83	3.18	6.98	1.93	5.11

[a] Average annual secchi was calculated from April 18, 1997 to November 4, 1997.
[b] Annual Spring secchi is from April 18, 1997 to June 11, 1997.
[c] Annual Summer secchi is from June 26, 1997 to September 17, 1997.
[d] Annual Fall secchi is from September 29, 1997 to November 4, 1997.
[e] Numbers in parenthesis represent the bottom in meters.

Table 3.3 Average annual and seasonal secchi measurements taken at thirteen stations on Coeur d'Alene Lake in 1998. Euphotic zone depths were empirically derived using the regression equation EZD=2.2302+1.4914(SD)R^2=.78 published by Alaska Fish and Game 1987. All measurements are in meters.

		Average		Spring		Summer		Fall		Winter	
Location	Station Depth	Annual Secchi[a]	Annual Euphotic Zone	Seasonal Secchi[b]	Seasonal Euphotic Zone	Seasonal Secchi[c]	Seasonal Euphotic Zone	Seasonal Secchi[d]	Seasonal Euphotic Zone	Seasonal Secchi[e]	Seasonal Euphotic Zone
Round Lake	2.00	1.27	Bottom (2.00)[f]	1.36	Bottom (2.00)[f]	1.29	Bottom (2.00)[f]	0.7	Bottom (2.00)[f]	-	-
Chatcolet Shallow	1.10	0.85	Bottom (1.10)	0.7	Bottom (1.10)	0.86	Bottom (1.10)	1	Bottom (1.10)	-	-
Rockford Bay	13.00	6.06	11.27	3.88	8.01	6.87	12.47	8.40	14.76	3.00	6.70
Windy Bay Shallow	15.00	5.47	10.39	3.43	7.34	6.22	11.50	7.87	13.96	2.00	5.21
Carey Bay	12.00	5.07	9.80	3.08	6.82	6.43	11.82	5.67	10.68	1.80	4.91
Windy Bay Deep	30.00	6.25	11.55	3.43	7.34	7.28	13.09	9.20	15.95	2.50	5.96
Mid Lake	18.00	5.27	10.09	2.90	6.56	6.93	12.57	6.23	11.53	1.90	5.06
Conkling Point	15.00	4.42	8.82	2.92	6.59	5.47	10.39	4.47	8.89	-	-
Chatcolet Lake	10.00	3.37	7.26	2.60	6.11	4.50	8.94	2.57	6.06	1.00	3.72
Hidden Lake	7.00	3.52	7.48	2.14	5.42	4.77	9.35	2.90	6.56	-	-
Benewah Lake	4.50	2.51	5.98	1.53	4.51	3.29	7.13	2.00	5.21	-	-
Coeur d'Alene River	10.00	5.05	9.76	3.15	6.93	6.02	11.20	6.67	12.17	2.00	5.21
St. Joe River	11.00	3.75	7.83	3.88	8.02	3.84	7.95	3.10	6.85	-	-

[a]Average annual secchi was calculated from March 13, 1998 through November 17, 1998.
[b]Annual Spring secchi is from March 22, 1998 to June 21, 1998.
[c]Annual Summer secchi is from June 22, 1998 to September 21, 1998.
[d]Annual Fall secchi is from September 22, 1998 to December 21, 1998.
[e]Annual Winter secchi is from December 22, 1998 to March 21, 1998.
[f]Numbers in parenthesis represent the bottom in meters.

3.1.2 Fisheries

Coeur d'Alene Lake has been sampled on a regular basis since 1994. In 1994, 1,418 fish were sampled by electrofishing and 211 fish were sampled using horizontal gillnets. During 1995, 1,727 fish were sampled by electrofishing and 78 fish were sampled using horizontal gillnets. In 1996, 536 fish were sampled by electroshocking and 286 fish were sampled using horizontal gillnets. Largescale suckers and yellow perch were the two most frequently sampled fish for all three years by electroshocking. Yellow perch, northern pikeminnow and largescale suckers were the most frequently sampled fish in the horizontal gillnets during all three years. Refer to Peters et al. (1999) for a detailed analysis of relative abundance data for all three years.

In 1994, 20 hours and 56 minutes were spent electroshocking and gillnets were set for 69 hours. During 1995, 24 hours and 53 minutes were spent electroshocking and gillnets were set for 79 hours. In 1996, 12 hours were spent electroshocking and gillnets were set for 170 hours and 50 minutes. Refer to Peters et al. (1999) for a detailed analysis of the CPUE data from 1994-1996.

During 1997 and 1998, Coeur d'Alene Lake was sampled a total of eleven times. 11,806 fish were sampled by electroshocking and 1,372 fish were sampled using horizontal and vertical gillnets. During both years largescale suckers were the most abundant fish sampled by electroshocking and yellow perch were the most abundant fish sampled in gillnets.

Table 3.4 Electroshocking relative abundance results from 1997 and 1998 for Coeur d'Alene Lake.

Species	1997 n=4599	Species	1998 n=7207
LSS	28.55% (1313)	LSS	24.6% (1771)
YP	22.94% (1055)	LMB	16.4% (1179)
PSS	10.55% (485)	YP	16% (1155)
LMB	09.92% (456)	BC	14.9% (1073)
SQW	09.35% (430)	PSS	09.4% (676)
BC	08.52% (392)	SQW	08.1% (585)
BBH	04.02% (185)	BBH	04.6% (333)
TCH	03.50% (161)	TCH	04.1% (297)
CTT	0.78% (36)	CTT	0.6% (40)
PIK	0.50% (23)	PIK	0.5% (36)
SCP	0.43% (20)	CHN	0.3% (21)
KOK	0.33% (15)	SMB	0.2% (17)
CHN	0.30% (14)	MWF	0.1% (10)
MWF	0.15% (7)	SCP	0.1% (9)
CCF	0.09% (4)	CCF	0.1% (5)
SMB	0.04% (2)		
RBT	0.02% (1)		
BLT	0		

In 1997, 4,599 fish were sampled over a four-month period (July – October). It's known that there are twenty-one different species of fish in the lake. Seventeen of the twenty-one fish species were sampled by electroshocking (Table 3.4). Largescale suckers were the most frequently sampled fish. They made up more than ¼ of the catch at 28.55% (1313). Yellow perch were second at 22.94% (1055), followed by pumpkinseed at 10.55% (485), largemouth bass 9.92% (456), northern pikeminnow 9.35% (430), black crappie 8.52% (392), brown bullhead 4.02% (185), tench 3.50% (161), cutthroat trout 0.78% (36), northern pike 0.50% (23), sculpin 0.43% (20), kokanee trout 0.33% (15), chinook salmon 0.30% (14), mountain whitefish 0.15% (7), channel catfish 0.09% (4), smallmouth bass 0.04% (2), and rainbow trout 0.02% (1).

In 1997, exotic species made up 60.73% of the electrofishing catch while native species made up the rest. Non-game native species made up 38.33% of the catch while native game fish made up only 0.93% of the catch.

During 1997, 42 hours and 27 minutes were spent electroshocking (Table 3.5). Largescale suckers had the highest CPUE (fish/hr) at 30.93. Yellow perch were next at 24.85, pumpkinseed 11.43, largemouth bass 10.74, northern pikeminnow 10.13, black crappie 9.23, brown bullhead 4.36, tench 3.79, cutthroat trout 0.85, northern pike 0.54, sculpin 0.47, kokanee salmon 0.35, chinook salmon 0.33, mountain whitefish 0.16, channel catfish 0.09, smallmouth bass 0.05, and rainbow trout 0.02.

In 1997, horizontal gillnets were used at all of the sites and a total of 636 fish were sampled (Table 3.6). Thirteen out of the twenty-one species were sampled. The species most frequently sampled was yellow perch at 34.28% (218). Largescale suckers were next at 21.23% (135), followed by northern pikeminnow 18.55% (118), kokanee salmon 10.06% (64), brown bullhead 7.39% (47), black crappie 2.52% (16), cutthroat trout 1.42% (9), tench 1.26% (8), pumpkinseed 0.94% (6), chinook salmon 0.79% (5), channel catfish 0.63% (4), and mountain whitefish 0.16% (1).

In 1997, exotic species made up 58.66% of the gillnet catch while native species made up the rest. Non-game native species made up 39.78% of the catch while native game fish made up 1.58% of the catch.

Horizontal gillnets were set for 677 hours in 1997 (Table 3.7). Yellow perch had the highest CPUE at 0.32 followed by largescale suckers 0.20. Next were northern pikeminnow 0.17, kokanee salmon 0.09, brown bullhead 0.07, black crappie 0.02, cutthroat trout 0.01, tench 0.01, pumpkinseed 0.01, chinook salmon 0.01, northern pike 0.01, channel catfish 0.01 and mountain whitefish 0.001.

Coeur d'Alene Lake was sampled seven times (April-October) during 1998. 7,207 fish were sampled during 1998 (Table 3.4) and fifteen out of the twenty-one species were sampled. The most frequently sampled fish was the largescale sucker 24.6% (1771). Largemouth bass typically not as abundant was the second most frequently taken fish 16.4% (1179). Next were yellow perch 16.0% (1155), black crappie 14.9% (1073), pumpkinseed 9.4% (676), northern pikeminnow 8.1% (585), brown bullhead 4.6% (333), tench 4.1% (297), cutthroat trout 0.6% (40), northern pike 0.5% (36), chinook salmon 0.3% (21), smallmouth bass 0.2% (17), mountain whitefish 0.1% (10), sculpin 0.1% (9), and channel catfish 0.1% (5).

In 1998, exotic species made up 66.5% of the electrofishing catch while native species made up the rest. Non-game native species made up 32.80% of the catch while native game fish made up 0.7% of the catch.

Table 35 Electroshocking catch per unit effort during 1997.

	1997	
Species	n=4599	Hr./min. **42.27**
LSS	1313	30.93
YP	1055	24.85
PSS	485	11.43
LMB	456	10.74
SQW	430	10.13
BC	392	9.23
BBH	185	4.36
TCH	161	3.79
CTT	36	0.85
PIK	23	0.54
SCP	20	0.47
KOK	15	0.35
CHN	14	0.33
MWF	7	0.16
CCF	4	0.09
SMB	2	0.05
RBT	1	0.02
BLT	0	0.00

Table 3.6 Gillnetting relative abundance results from 1997 and 1998 for Coeur d'Alene Lake.

	1997		1998
Species	n=636	Species	n=636
YP	34.28% (218)	YP	52.6% (335)
LSS	21.23% (135)	SQW	20.4% (130)
SQW	18.55% (118)	LSS	09.3% (59)
KOK	10.06% (64)	BBH	05.7% (36)
BBH	07.39% (47)	KOK	03.8% (24)
BC	02.52% (16)	BC	02.4% (15)
CTT	01.42% (9)	PIK	02.4% (15)
TCH	01.26% (8)	CTT	01.4% (9)
PSS	0.94% (6)	CHN	01.3% (8)
CHN	0.79% (5)	TCH	0.5% (3)
PIK	0.79% (5)	RBT	0.2% (1)
CCF	0.63% (4)	LMB	0.2% (1)
MWF	0.16% (1)		

In 1998, 64 hours and 36 minutes were spent electrofishing (Table 3.8). Largescale suckers had the highest CPUE at 27.52 fish/hour. Largemouth bass were second at 18.32 followed by yellow perch 17.95, black crappie 16.67, pumpkinseed 10.50, northern pikeminnow 9.09, brown bullhead 5.17, tench 4.61, cutthroat trout 0.62, northern pike 0.56, chinook salmon 0.33, smallmouth bass 0.26, mountain whitefish 0.16, sculpin 0.14, and channel catfish 0.08.

During 1998, vertical gillnets were used to sample deep open water and horizontal nets were used in shallow lakes and bays. In 1998, 636 fish were sampled using the vertical and horizontal gillnets (Table 3.5). Yellow perch were the most abundant fish species making up more than half of the catch 52.6% (335). Northern pikeminnow were the second most frequently sampled fish at 20.4% (130), followed by largescale suckers 9.3% (59), brown bullhead 5.7% (36), kokanee salmon 3.8% (24), black crappie 2.4% (15), northern pike 2.4% (15), cutthroat trout 1.4% (9), chinook salmon 1.39% (8), tench 0.5% (3), rainbow trout 0.2% (1), and largemouth bass 0.2% (1).

Table 3.7 Gillnetting catch per unit effort during 1997.

	1997	
Species	(n=636)	Hours **677**
YP	218	0.32
LSS	135	0.20
SQW	118	0.17
KOK	64	0.09
BBH	47	0.07
BC	16	0.02
CTT	9	0.01
TCH	8	0.01
PSS	6	0.01
CHN	5	0.01
PIK	5	0.01
CCF	4	0.01
MWF	1	0.00
BLT	0	0.00
LMB	0	0.00
RBT	0	0.00
SCP	0	0.00
SMB	0	0.00

Table 3.8 Electroshocking catch per unit effort during 1998.

	1998	
Species	N=7202	Hr./min. **64.36**
LSS	1771	27.52
LMB	1179	18.32
YP	1155	17.95
BC	1073	16.67
PSS	676	10.50
SQW	585	9.09
BBH	333	5.17
TCH	297	4.61
CTT	40	0.62
PIK	36	0.56
CHN	21	0.33
SMB	17	0.26
MWF	10	0.16
SCP	9	0.14
CCF	5	0.08

In 1998, exotic species made up 69.1% of the gillnet catch while native species made up the rest. Non-game native species made up 29.7% of the catch while native game fish made up 1.4% of the catch.

In 1998, 968 hours were spent having vertical and horizontal gillnets in the water (Table 3.9). Yellow perch had the highest CPUE at 0.346. Northern pikeminnow was second with 0.134, followed by largescale suckers 0.061, brown bullhead 0.037, kokanee salmon 0.025, black crappie 0.015, northern pike 0.015, cutthroat trout 0.009, chinook salmon 0.008, tench 0.003, rainbow trout 0.001, and largemouth bass 0.001.

Age Analysis

Total number of fish scaled in was 1,499 in 1997; and 2,582 in 1998. Graphs showing the age distribution, length and weight frequency distribution and length and weight regression analysis are in Appendix D. In order to perform a regression analysis on aged fish we needed at least four different age classes. Chinook salmon, mountain whitefish, and smallmouth bass were lacking the four-age class requirement, so the data was combined from 1997 and 1998 for these three species. There was no regression analysis done on rainbow trout because only two fish have been sampled. Channel catfish were sampled in 1997 but they were not aged. In 1998, Dr. Scarnecchia, professor at University of Idaho aged the five channel catfish spines.

When comparing the mean length and weight, standard deviation and range for aged fish during the two sample years, the results vary slightly (Appendix E). Roughly the same number of yellow perch were sampled in 1997 and 1998. The statistical results were almost identical for each age group. On the other hand the statistical analysis for kokanee salmon showed an increase in mean length and weight from 1997 to 1998.

Habitat Suitability Index

When comparing the 1997 and 1998 (Table 3.10 & 3.11) habitat suitability indexes, Carey Bay and Conkling Point provided the same cutthroat habitat both years and other sites saw a dramatic decrease in habitat suitability. Rockford Bay and Windy Bay Shallow saw a decrease in the depth range of 7-11 meters. Rockford Bay went from 0.845 SI to 0.0 SI and Windy Bay Shallow from 0.94 SI to 0.0 SI. Hidden Lake and Chatcolet Lake Deep both saw an improvement in their bottom depth zone. Hidden Lake went from 0.0 SI to 0.67 SI and Chatcolet Lake Deep from 0.0 SI to 0.88 SI.

Table 3.9 Gillnetting catch per unit effort during 1998.

	1998	
Species	n=636	Hours **968**
YP	335	0.346
SQW	130	0.134
LSS	59	0.061
BBH	36	0.037
KOK	24	0.025
BC	15	0.015
PIK	15	0.015
CTT	9	0.009
CHN	8	0.008
TCH	3	0.003
RBT	1	0.001
LMB	1	0.001

Except for only a few areas it appears that the upper ten meters of Coeur d'Alene Lake is unsuitable for cutthroat trout(Table 3.10 & 3.11). This is based primarily on summertime daily maximum temperatures exceeding what is considered optimum for cutthroat trout survival. HSI's calculated in 1995 and 1996 for the same sample areas showed similar results (Peters et. al. 1999). In areas where temperatures are within the tolerance limits for cutthroat trout (primarily the hypolimnion) dissolve oxygen content becomes a factor. When temperatures are reaching their maximum dissolved oxygen in the hypolimnion drops below what is considered optimum for cutthroat trout. Thus, cutthroat trout are unable to seek refuge from the high water temperatures in the lower depths of the lake due to suboptimal dissolved oxygen concentrations.

3.2 Stream Studies

3.2.1 Water Quality

Lake Creek

Water temperature measured at the lower Lake Creek station indicated an instantaneous maximum of 25.5° C on July 25th, 1998. The 7-day moving average at the same station exceeded 16° C from July 4th through September 10th. Daily temperature fluctuations ranged from 6.2° C to 8.6° C during this period, indicating that substantial over-night cooling did take place. Temperatures recorded at the upper Lake Creek station were considerably lower. The 7-day moving average exceeded 16° C from July 23rd to August 6th, with an instantaneous maximum temperature of 19°C. Gaps in data prior to July 23rd, however, may have missed several days of high temperatures. Measured levels of dissolved oxygen generally did not drop below 9 mg/L at the lower station, where the highest temperatures were recorded.

Benewah Creek

A maximum temperature of 26° C was recorded at the mouth of Benewah Creek on July 25th and 26th, 1998. The 7-day moving average exceeded 16° C from June 29th through September 6th, and minimum temperature did not fall below 16° C between July 8th and September 2nd. Dissolved oxygen did not fall below 9 mg/l during the period of highest water temperatures at this same site. Discharge at the 3 mile station ranged from 5.2 to 1.1 cfs from July through September.

Tributary habitats generally provided more suitable water temperatures than mainstem reaches however diminished water quality was frequently noted. In S.F. Benewah Creek, maximum instantaneous water temperature was 21°C and 7-day moving average exceeded 16° C for just 12 days. Measured levels of dissolved oxygen did not drop below 9 mg/l during the period of highest temperatures. Discharge, however, was less than 1.0 cfs from mid July through early November. School House Creek was also a source of cold water and the 7-day moving average exceeded 16° C for just 13 days. There were periods, however, where habitat consisted of stagnant pools from July through August and dissolved oxygen decreased from 5.8 to 2.3 mg/l during this time. The average daily temperature in Windfall Creek exceeded 16° C from July through mid August. A maximum temperature of 27.5° C was recorded on July 27. There was little flow in Windfall Creek from late July through August and dissolved oxygen dropped below 9 mg/l during this period. In Whitetail Creek, the average daily water temperature exceeded 16°C from mid-July through mid-August and stream flow decreased to zero.

Evans Creek

A maximum instantaneous water temperature of 18.5° C was recorded several times between July 26th and August 5th, 1998. The 7-day moving average exceeded 16° C for 12 days in late July and early August. Average daily water temperature may have exceeded 16°C in mid July as well, but temperature monitors were not deployed until July 23rd. Measured levels of dissolved oxygen did not drop below 9 mg/l during the period of highest water temperatures. Stream flow ranged from 4.5 to 2.7 cfs from mid-August through early October.

Alder Creek
The maximum instantaneous water temperature was 24° C on July 27th and 28th, 1998. The 7-day moving average exceeded 16° C from July through mid August. Measured levels of dissolved oxygen did not drop below 9 mg/l during the period of highest water temperatures and base flows ranged from 2.3 to 0.4 cfs during the same period.

Table 3.10 Habitat suitability index for lacustrine Cutthroat Trout based on water quality for 1997.

Location	Depth	HSI[a]		Suitability Index
Rockford Bay	0-7 Meters	$(0.25x1x1)^{1/3}$	=	0.25 SI
	7-11 Meters	$(0.60x1x1)^{1/3}$	=	0.845 SI
	11-Bottom (14)[b]	$(1x1x1)^{1/3}$	=	1.0 SI
Windy Bay Shallow	0-7 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	7-10 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	10-Bottom (15)	$(1x1x1)^{1/3}$	=	1.0 SI
Windy Bay Deep	0-10 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	10-15 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	15-Bottom (33)	$(1x1x1)^{1/3}$	=	1.0 SI
Coeur d'Alene River	0-Bottom	$(0.0x1x1)^{1/3}$	=	0.0 SI
Mid-Lake Coeur d'Alene	0-10 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	10-13 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	13-Bottom (17)	$(1x1x1)^{1/3}$	=	1.0 SI
Carey Bay	0-10 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	10-12 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	12-Bottom (13)	$(1x1x1)^{1/3}$	=	1.0 SI
Conkling Point	0-10 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	10-13 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	13-Bottom (16)	$(1x1x1)^{1/3}$	=	1.0 SI
Hidden Lake	0-5 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	5-7 Meters	$(0.8x1x1)^{1/3}$	=	0.92 SI
	7-Bottom (10)	$(1x0.0x1)^{1/3}$	=	0.0 SI
Round Lake	0-Bottom (1.5)	$(0.0x1x1)^{1/3}$	=	0.0 SI
Chatcolet Lake Deep	0-6 Meters	$(0.0x1x1)^{1/3}$	=	0.0 SI
	6-9 Meters	$(0.85x1x1)^{1/3}$	=	0.94 SI
	9-Bottom (11)	$(1x0.0x1)^{1/3}$	=	0.0 SI
Chatcolet Lake Shallow	0-Bottom (1.5)	$(0.0x1x1)^{1/3}$	=	0.0 SI
Benewah Lake	0-Bottom (4.5)	$(0.0x1x1)^{1/3}$	=	0.0 SI
St. Joe River	0-Bottom (12.5)	$(0.4x1x1)^{1/3}$	=	0.4 SI

[a] Habitat Suitability Index (HSI).
[b] Numbers in parenthesis represent the bottom in meters.

Table 3.11 Habitat suitability index for lacustrine cutthroat trout based on water quality for 1998.

Location	Depth	HSI[a]		Suitability Index
Rockford Bay	0-7 meters	$(0x1x1)^{1/3}$	=	0.0 SI
	7-11 meters	$(0x1x1)^{1/3}$	=	0.0 SI
	11-bottom (14)[b]	$(.7x1x1)^{1/3}$	=	0.89 SI
Windy Bay Shallow	0-7 meters	$(0x1x1)^{1/3}$	=	0.0 SI
	7-10 meters	$(0x1x1)^{1/3}$	=	0.0 SI
	10-bottom (16)	$(.45x1x1)^{1/3}$	=	0.77 SI
Windy Bay Deep	0-10 meters	$(0x1x1)^{1/3}$	=	0.0 SI
	10-15 meters	$(.46x1x1)^{1/3}$	=	0.77 SI
	15-bottom (32)	$(1x1x1)^{1/3}$	=	1.0 SI
Coeur d'Alene River	0-bottom (12)	$(0x1x1)^{1/3}$	=	0.0 SI
Mid-Lake Coeur d'Alene	0-10 meters	$(0x1x1)^{1/3}$	=	0.0 SI
	10-13 meters	$(.95x1x1)^{1/3}$	=	0.98 SI
	13-bottom (19)	$(1x.85x1)^{1/3}$	=	0.95 SI
Carey Bay	0-10 meters	$(0x1x1)^{1/3}$	=	0.0 SI
	10-12 meters	$(.84x1x1)^{1/3}$	=	0.94 SI
	12-bottom (14)	$(1x1x.98)^{1/3}$	=	0.99 SI
Conkling Point	0-10 meters	$(0x1x1)^{1/3}$	=	0.0 SI
	10-13 meters	$(.75x1x1)^{1/3}$	=	0.91 SI
	13-bottom (16)	$(1x.86x1)^{1/3}$	=	0.95 SI
Hidden Lake	0-5 meters	$(0x1x1)^{1/3}$	=	0.0 SI
	5-7 meters	$(.24x.8x1)^{1/3}$	=	0.58 SI
	7-bottom (9)	$(1x.30x1)^{1/3}$	=	0.67 SI
Round Lake	0-bottom (2)	$(0x1x1)^{1/3}$	=	0.0 SI
Chatcolet Lake Deep	0-6 meters	$(0x1x1)^{1/3}$	=	0.0 SI
	6-9 meters	$(.65x.79x1)^{1/3}$	=	0.80 SI
	9-bottom (11)	$(1x.68x1)^{1/3}$	=	0.88 SI
Chatcolet Lake Shallow	0-bottom (1.1)	$(0x1x1)^{1/3}$	=	0.0 SI
Benewah Lake	0-bottom (5)	$(0x0x1)^{1/3}$	=	0.0 SI
St. Joe River	0-bottom (13)	$(0x1x1)^{1/3}$	=	0.0 SI

[a] Habitat Suitability Index (HSI).
[b] Numbers in parenthesis represent the bottom in meters.

3.2.2. Spawning Gravel Survey and Analysis

Cutthroat trout primarily reside and spawn in reaches of small (1-4 meters wide) tributaries with moderate gradients (1.0-4.4%) and suitable spawning gravels (Table 3.12). Substrate embeddedness was high at the sampled sites, averaging about 50 percent. Proportion of potential spawning gravel was low and did not vary much among sites (mean = 4.1±2.1). We found no association between abundance of suitable spawning gravels and reach gradient, proportion of riffle habitat, proportion of pea gravel, or proportion of gravel substrate.

Table 3.12 Means of habitat features in spawning reaches of Alder (A), Benewah (B), Evans (E), and Lake (L) creeks and their major tributaries.

Reach	Gra-dient (%)	Width (ft.)	Depth (ft.)	Embed-dedness [a]	Percent by Area					
					Spawning gravel	Riffle	Silt	Pea gravel	Gravel	Rubble
Alder										
A9	2.3	6.3	1.1	2.4	5.5	30	10	65	25	0
North Fork	2.3	11.6	1.5	2.6	2.8	9	10	51	33	6
Benewah										
B12	1.0	16.0	2.4	3.4	1.5	14	8	45	40	7
Bull	3.0	6.3	1.4	3.0	1.1	42	4	58	38	0
School House	1.6	5.9	1.5	4.0	5.7	14	7	64	28	1
South Fork	3.9	7.3	1.0	3.2	3.3	27	5	34	31	13
West Fork	4.4	5.0	0.9	2.6	6.9	20	9	61	27	2
Whitetail	4.2	6.3	1.0	2.2	8.9	31	7	34	49	10
Windfall	1.6	6.6	1.1	2.4	5.1	10	5	41	38	16
Evans										
R5	6.0	10.0	1.5	1.0	1.3	0	7	41	27	15
R6	7.5	3.5	0.9	1.5	2.4	0	10	46	33	8
R7	7.5	4.0	0.9	3.0	3.5	0	7	47	35	7
East Fork	4.0	4.5	1.5	1.0	3.9	0	6	46	48	0
South Fork	9.5	3.0	0.9	3.0	4.1	0	3	26	53	15
Lake										
L8	1.2	5.5	1.6	3.8	3.5	32	6	66	28	0
Bozard	2.4	5.7	1.4	3.3	4.9	40	5	36	48	11
West Fork	3.9	5.1	0.8	2.9	5.0	44	7	43	46	4

[a] Rated on a scale from1 to 4 for percent of substrate embedded: 1 = >75%; 2 = 50 – 75%; 3 = 25 – 50%; 4 = 0 – 25% (Platts et al. 1983).

Predicted emergence success was generally high, averaging 28.4 percent for all sampled sites (Table 3.13). Emergence success was positively correlated to the F_i at each site (r = 0.79). The lowest values were observed in upper Lake Creek, where silt and sand sized particles comprised 63 and 89 percent of the core samples, respectively at the two sampled sites. Fry production was positively correlated to the availability of spawning gravel in the sampled reaches (r = 0.78). The production potentials for sampled sites ranged from 0 to 31.2 fry/100 square meters (mean=13.7±8.2). The highest calculated values occurred in several tributaries to Benewah Creek.

3.2.3 Population Surveys

General patterns of cutthroat trout abundance and distribution vary among the target watersheds but are consistent from year to year and seem to be highly correlated to seasonal changes in water quality and quantity. As reported in past years (Peters et al. 1999; Lillengreen et al. 1996), cutthroat trout were sporadically distributed in the Lake, Benewah, and Alder Creek watersheds during base flow condition in the summer (Tables 3.14). Abundance in the second order tributaries was consistently much higher than in adjacent mainstem reaches for both Lake Creek (mean = 19.4 fish/100 sq. m. versus 1.2 fish/100 sq. m.) and Benewah Creek (mean = 14.5 fish/100 sq. m. versus 0.5 fish/100 sq. m.), despite the effects of low flow conditions. During base flow conditions, for example, cutthroat trout were observed crowding (>15 fish/sq. m.) into small, isolated pools located in cool tributaries, rather than face conditions of high water temperatures in mainstem reaches. In contrast, favorable temperature and flow conditions in the Evans Creek watershed resulted in a more even distribution of cutthroat trout (mean = 2.7 fish/100 sq. m., range = 1.0-4.8) in the lower mainstem reaches. The highest recorded abundance still occurred in the upper mainstem and primary tributaries where the majority of spawning activity is thought to take place. Of all the target watersheds, abundance has been consistently lowest in Alder Creek, with much of the upper watershed and the North Fork devoid of cutthroat.

Brook trout have been found only in the Alder Creek and Benewah Creek watersheds--their respective dates of introduction are unknown. In Alder Creek, brook trout are found in greater numbers than cutthroat trout in all but the lowermost stream reaches (Table 3.15). Fish were distributed fairly evenly (mean = 3.6 fish/100 sq. m.) in 11 of 13 sampled stream reaches. The remaining two reaches are influenced by vast beaver dam complexes and supported significantly higher populations (17.0 and 18.8 fish/100 sq. m., respectively). Distribution in the Benewah Creek watershed was limited to the upper mainstem and Windfall Creek. Abundance of brook trout ranged from 0.4-17.7 fish/100 square meters, and was much lower than for cutthroat trout in all sampled reaches.

Analysis of the age frequency of cutthroat trout caught during population surveys indicated that 88% of the catch consisted of juveniles (age 0-3) when averaged across all watersheds (Table 3.16). Young of the year cutthroat comprised an unusually high percentage of the catch (50.2%) in the Lake Creek watershed.

Table 3.13 Number of cores, mean fredle index (F_i) of substrate composition of cores (range in parentheses), predicted mean emergence success, and mean estimated production potential for reaches in Alder (A), Benewah (B), Evans (E), and Lake (L) creek subbasins and their primary tributaries.

Reach or subbasin	Number of cores	F_i	Emergence success	Production potential (# of fry/ 100 square meters)
Alder	**5**	**7.8 (6.0-11.2)**	**31.9**	**11.8**
A9	1	6.0	30.6	19.8
North Fork	4	8.2 (7.0-11.2)	32.3	10.6
Benewah	**9**	**7.1 (2.4-16.6)**	**29.6**	**15.3**
B12	1	3.7	31.2	5.5
Bull	1	16.6	38.7	4.9
School House	1	5.3	28.4	19.0
South Fork	2	2.8 (2.4-3.1)	24.0	9.1
West Fork	2	5.9 (4.7-7.1)	26.9	24.0
Whitetail	1	7.6	29.6	31.2
Windfall	1	13.8	36.9	22.2
Evans	**8**	**8.8 (2.7-13.7)**	**31.5**	**11.1**
R5	1	7.1	30.6	4.9
R6	2	11.1 (8.5-13.7)	34.7	9.8
R7	2	10.4 (10.0-10.7)	34.7	14.5
East Fork	1	2.7	14.7	6.8
South Fork	2	8.8 (6.6-11.0)	33.8	16.0
Lake	**7**	**4.5 (0.8-7.1)**	**20.9**	**13.6**
L8	2	0.9 (0.8-0.9)	0.0	0.0
Bozard	2	5.4 (4.1-6.7)	28.2	16.6
West Fork	3	6.4 (5.9-7.1)	29.9	17.7
Totals	**29**	**7.1**	**28.4**	**13.0**

Age and Growth

A total of 614 cutthroat and brook trout scales were examined for age and growth determination in 1998. Growth and potential maximum size of cutthroat trout varied from stock to stock (Table 3.17). As in past years, the adfluvial stocks found in Benewah Creek and Lake Creek exhibit the maximum growth potential for this species. The largest cutthroat recorded in Lake Creek for 1998 measured 16.3 inches (415 mm TL) and 1.5 pounds (667 grams), while the largest fish in Benewah Creek measured 15.2 inches (385 mm TL) and 1.3 pounds (570 grams). Maximum growth for resident fish stocks ranged from 222 to 280mm total length and 102 to 180 grams. A complete tabular analysis of growth for cutthroat trout is provided in (Appendix F).

Table 3.14 Cutthroat trout abundance and distribution by watershed, 1998.

Lake Creek Cutthroat Trout			Summer 98		
Tributary	Reach	Area (sq. m)	N±(SE)	#/100 sq. m	Total #
Mainstem	1	5396	0.0	0.0	0
	4	2696	0.0	0.0	0
	5	2555	0.0	0.0	0
	6	11668	28(2.6)	4.9	572
	7	13284	7(0.0)	1.1	146
	8	9715	26(0.5)	6.1	593
West Fork	9,10	6270	125(1.7)	42.0	2633
Bozard	1,2,3	11085	28(2.5)	10.0	1109
Total		62669	214(4.0)		5053

Evans Creek Cutthroat Trout			Summer 98		
Tributary	Reach	Area (sq. m)	N±(SE)	#/100 sq. m	Total #
Mainstem	1	4977	4(0.0)	1.0	50
	2	7227	21(2.2)	2.2	159
	3	1970	8(0.0)	2.7	53
	4	10127	20(1.6)	2.8	284
	5	2692	16(2.2)	4.8	129
	6	1178	12(0.8)	9.2	108
	7	2231	12(0.6)	8.1	181
E.F.Evans	1	3990	23(3.6)	12.4	495
R.F.Evans	1	2099	6(0.8)	8.1	170
S.F.Evans	1,2	1126	14(3.0)	12.6	142
Total		37616	136(3.0)		1771

Benewah Creek Cutthroat Trout			Summer 98		
Tributary	Reach	Area (sq. m)	N±(SE)	#/100 sq. m	Total #
Mainstem	1	7422	0	0.0	0
	2	9419	1(0.0)	0.1	9
	3	5588	10(0.0)	1.3	73
	4	16104	0	0.0	0
	5	2318	0	0.0	0
	8	5656	10(2.9)	1.1	62
	9	5648	6(0.0)	1.1	62
	10	25981	3(0.0)	0.3	78
	11	1399	1(0.0)	0.3	4
South East Fork	13	6915	69(3.2)	17.7	1224
West Fork	14	3205	44(2.7)	33.8	1083
Bull	1	3685	14(2.2)	18.8	693
Coon	1,2	2149	0	0.0	0
School House	1	2741	2(0.0)	0.9	25
Whitetail	1,2	5204	10 (0.8)	6.7	349
Windfall	2	5531	35(4.5)	23.5	1300
Total		108966	205(7.2)		4962

Alder Creek Cutthroat Trout			Summer 98		
Tributary	Reach	Area (sq. m)	N±(SE)	#/100 sq. m	Total #
Mainstem	1	7052	0	0.0	0
	2	1825	0	0.0	0
	3	9446	2(0.0)	3.6	340
	4	4158	6(0.0)	2.2	91
	5	5064	2(0.0)	0.4	20
	6	1823	2(0.0)	0.7	13
	7	16860	13(1.0)	1.4	236
	8	4916	5(0.0)	1.4	69
	9	12635	0	0.0	0
N.Fork Alder	1	4475	0	0.0	0
	2	1403	0	0.0	0
	3	2058	0	0.0	0
	4	2503	0	0.0	0
Total		74216	30 (1.0)		769

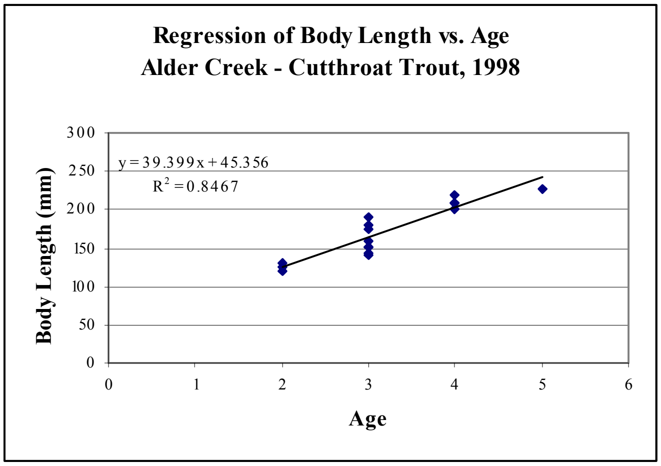
Table 3.15 Brook trout abundance and distribution by watershed, 1998.

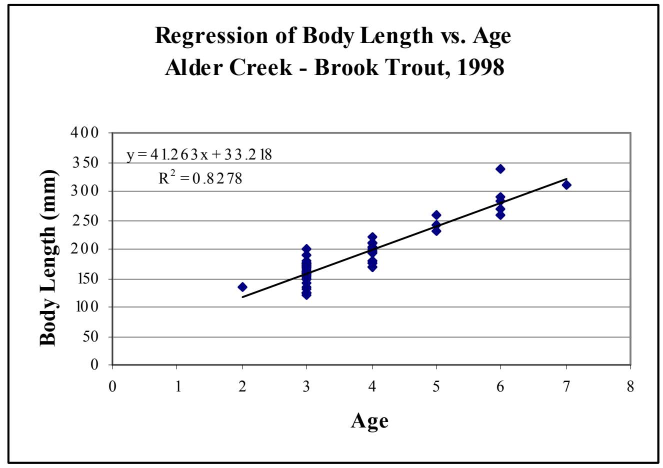
Benewah Creek Brook Trout		Summer 98			
Tributary	Reach	Area (sq. m)	N±(SE)	#/100 sq. m	Total #
Mainstem	1	7422	0	0.0	0
	2	9419	0	0.0	0
	3	5588	0	0.0	0
	4	16104	0	0.0	0
	5	2318	0	0.0	0
	8	5656	0	0.0	0
	9	5648	0	0.0	0
	10	25981	4(3.5)	0.4	104
	11	1399	4(0.0)	1.2	17
South East Fork	13	6915	11(1.4)	2.8	194
West Fork	14	3205	23(2.2)	17.7	567
Bull	1	3685	0	0.0	0
Coon	1,2	2149	0	0.0	0
School House	1	2741	0	0.0	0
Whitetail	1,2	5204	0	0.0	0
Windfall	2	5531	2(0.0)	1.3	72
Total		108966	44(4.3)		954

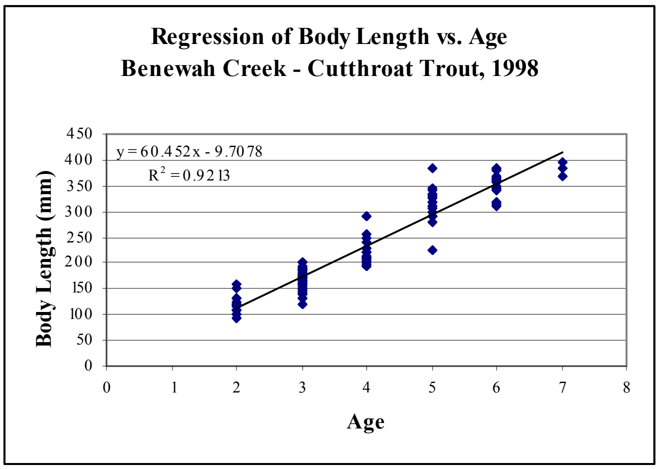
Alder Creek Brook Trout		Summer 98			
Tributary	Reach	Area (sq. m)	N±(SE)	#/100 sq. m	Total #
Mainstem	1	7052	0	0.0	0
	2	1825	0	0.0	0
	3	9446	2(0.0)	3.6	340
	4	4158	4(3.5)	2.2	91
	5	5064	16(0.6)	3.2	162
	6	1823	9(13.4)	3.2	58
	7	16860	64(12.8)	7.0	1180
	8	4916	60(5.3)	17.0	836
	9	12635	26(3.0)	7.4	935
N.F.Alder	1	4475	30(2.9)	8.5	380
	2	1403	16(3.0)	1.9	27
	3	2058	14(0.6)	3.1	64
	4	2503	14(2.2)	18.8	471
Total		74216	255(20.4)		4544

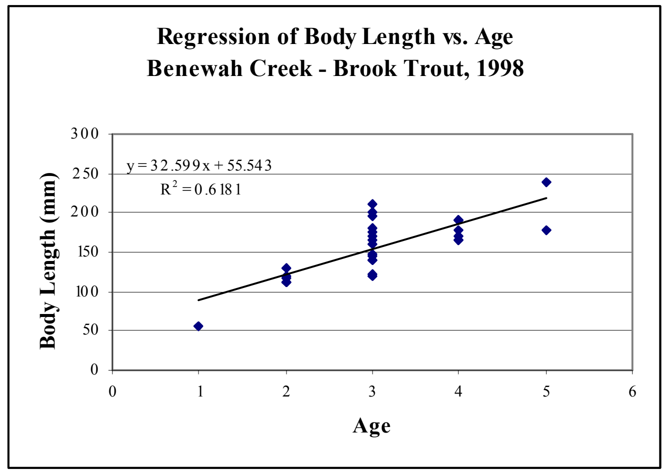
Table 3.16 Age frequency distribution of cutthroat trout in electrofishing samples by watershed, 1998.

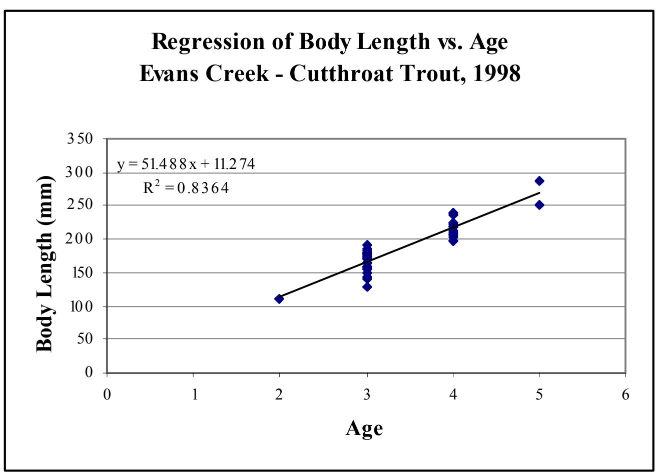
Count by Age Class	Age Class						
	Cutthroat Trout						
Watershed	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Alder	2	1	17	7	5		
Benewah	8	35	91	16	5	3	
Evans	5	28	45	31	16	3	
Lake	88	18	22	22	15	7	3











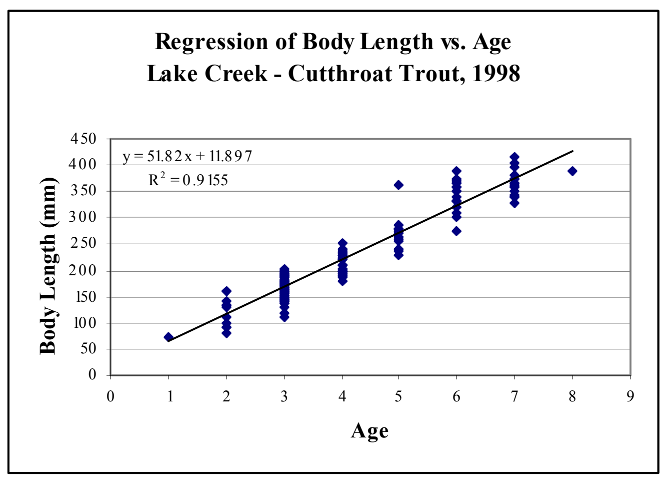


Figure 3.10 Regression equations of body length versus age for cutthroat and brook trout in four target watersheds, 1998.

Trout Migration

A total of 1277 cutthroat trout were caught in the lower Lake Creek trap in 1998 at a rate of 13.6 fish/day (Figure 3.10). Adult fish (age IV or older) accounted for 11.5% of the catch. Trapping success in Benewah Creek was considerably lower than in Lake Creek. A total of 535 cutthroat trout were caught in 1998 at a rate of 5.9 fish/day. Adult fish (age IV or older) accounted for 24.1% of the catch. Trapping efficiency for smolts was estimated to be high (>75%) at both trap locations, with the exception of a five day period at the end of May when the traps were covered with water and fish would have been able to swim around the weirs.

Upstream migration of adult fish into Benewah Creek and Lake Creek was documented for the period March 11 through April 24, 1998. Average daily water temperature during the documented period of upstream migration ranged from 3.1°C to 11.4°C (mean = 5.5°C) and 3.1°C to 9.9°C (mean = 5.1°C) in Benewah and Lake creeks, respectively. Residence time for adults in Benewah Creek ranged from 22 to 34 days (mean = 27 days), while residence time in Lake Creek averaged 44 days.

Outmigrant behavior, was observed predominantly in age II and III fish (Figures 3.11 and 3.12). These fish ranged in size from 9 to 54 grams and 120 to 162 mm long. More than 70 percent of these fish were greater than 18 grams and 125mm long. Migration by smaller fish was observed, however, mortality both from predation and physical damage likely increased with decreasing size and weight. Migration by smolts to Coeur d'Alene Lake began in mid-April, as water temperatures stabilized around 9°C, and was completed by early June. Peak migrations coincided with average daily water temperatures ranging from 9°C to 11°C and were often correlated with small spikes in the hydrograph.

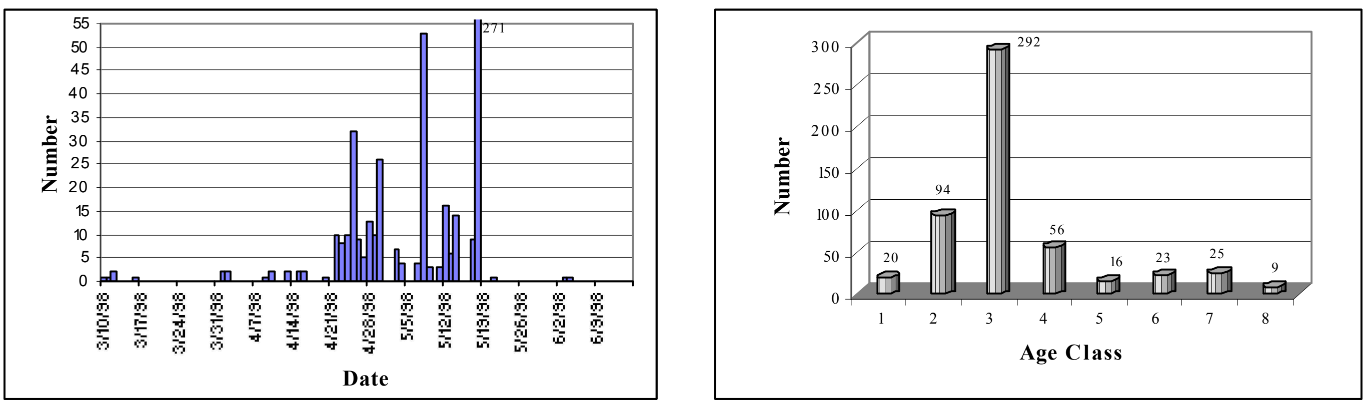


Figure 3.11 Analysis of cutthroat trout migration showing run timing and age frequency of migrants in Benewah Creek, 1998.

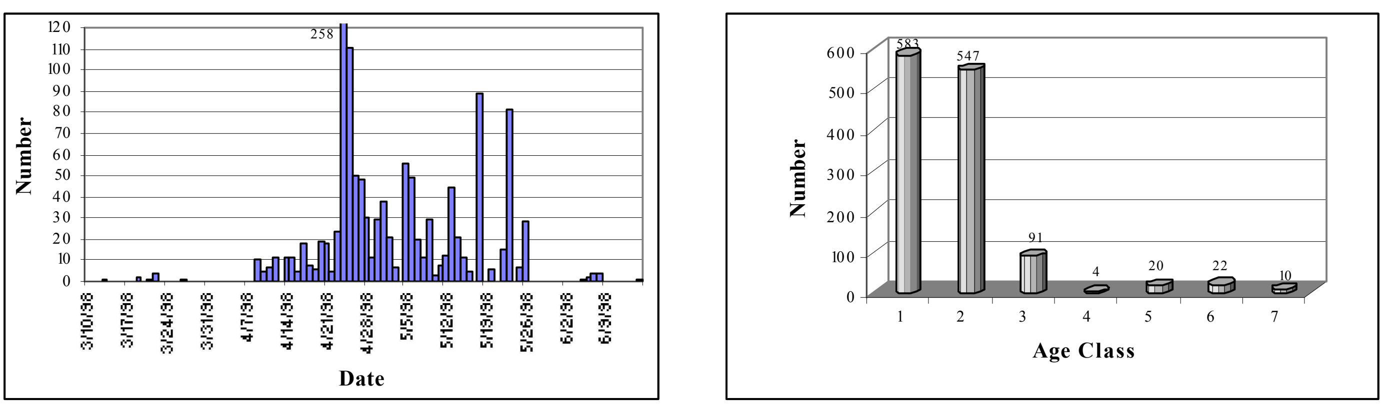


Figure 3.12 Analysis of cutthroat trut migration showing run timing and age frequency of migrants in Lake Creek, 1998.

4.0 Discussion

4.1 Lake Studies

Water Quality

Results from water quality sampling in 1998 did not differ much from results obtained in 1997. The main difference was in the number of sites with dissolved oxygen values below 6.0 mg/L. There were eight sites with values below 6.0 mg/L in 1998 and only four in 1997. A reason for the increase in the number of sites with dissolved oxygen readings below the optimum required for cutthroat trout survival was indirectly related to the weather. In 1998, from July to September there were 32 days with temperatures above 32.2^{o} C (90^{o} F), compared to only 10 days in 1997 (Personal communication with the National Weather Service). The more days with temperatures above 32.2^{o} C (90^{o} F) the warmer the water temperature will be. Upon comparing the water temperatures recorded in 1998 with the results from 1997 there was a noticeable difference. The thermoclines in both years seem to start around the end of May but it's the duration and depth at which the thermoclines occurred that was different. The thermoclines were much stronger and had a longer duration in 1998 compared to 1997. The surface temperatures also reached their peak at the end of July in 1998 compared to mid August in 1997. Due to the warmer air and water temperatures, and increased light penetration aquatic macrophyte growth most likely increased. Even though no direct measurements were taken. This in turn, led to more dead and decomposing material that sank and accumulated in the hypolimnion. Respiration and decomposition can easily deplete dissolved oxygen in the hypolimnion. Woods and Beckwith (1996) reported seeing low dissolved oxygen values in Coeur d'Alene Lake during the summer months of 1991 and 1992.

The low dissolved oxygen values that we are seeing in the hypolimnion is cause for concern when related to available fisheries habitat. The low dissolved oxygen values recorded in 1998 are not considered completely limiting for cutthroat trout suitability. The low dissolved oxygen values recorded, however, are thought to have indirect affects on cutthroat trout suitability in the southern lakes area (Peters et al. 1999). Peters et al. (1999) examined the habitat suitability and determined the lower 10 m in most areas is unsuitable habitat for cutthroat trout due to low dissolved oxygen values. This is not to say that cutthroat trout will not be found in these areas, but they most likely will have a hard time sustaining themselves for long periods of time.

Another more serious problem associated with decreases in dissolved oxygen values is the high concentration of metals that are bound up in the sediment north of the Coeur d'Alene River. Sediments to the south of the Coeur d'Alene River are relatively unaffected by heavy metal deposition from the Coeur d'Alene River. The deposition of trace elements in the sediments of Coeur d'Alene Lake is well documented by (Funk 1973; Rieman 1980; Woods 1989; Woods and Beckwith 1996). Lakebed geochemistry analyses revealed that most of the trace elements in surficial and subsurface sediments are associated with a ferric oxide phase and, thus, under reducing (anoxic) conditions, the trace elements would be readily solubilized and available for release to the overlying water column (Woods and Beckwith, 1996). The fact that trace metals are found in the sediments at the mouth of the river and north causes us to be concerned when sites like Windy Bay Deep and Mid-Lake Coeur d'Alene have dissolved oxygen values below 6.0 mg/L.

One hypothesis for the low dissolved oxygen values recorded is the presence of zinc in the water, which strongly inhibits phytoplankton growth. As phytoplankton drifts northward towards the mouth of the Coeur d'Alene River, it is thought to produce a sestonic "rain" of dead and dying phytoplankton that settles into the hypolimnion of the lake's northern basin and produces the hypolimnetic dissolved-oxygen deficit when the lake is thermally stratified (Woods and Beckwith, 1996). Monitoring dissolved oxygen levels in the hypolimnion is and will continue to be a high priority so that heavy metal contamination of the over lying water column will not occur.

Sediment transport to the lake from the tributaries continues to be a problem. The build up of these sediments at the mouths of all incoming tributaries to Coeur d'Alene Lake results in the loss of existing wetlands and provides prime habitat for predators of cutthroat trout. The increase in sediment also gives aquatic macrophytes more room to establish themselves along with providing more suitable forage habitat for non-native species. Sediment accumulation near the mouth of Plummer Creek, in Chatcolet Lake, has occurred at an average rate of 2.4 cm per year since the Mt. St. Helen's eruption of May 18, 1980 (Breithaupt, 1990). To examine the amount of sediment that has entered the Coeur d'Alene system aerial photos from 1933 and 1995 were compared. It was noted that the size of the deltas on four main tributaries that feed into Coeur d'Alene Lake are increasing in size. Another interesting point to be made is the change in vegetation over the years. In 1933, the tributaries at their mouths had well defined channels and were lined with cottonwoods. Now the mouths of the tributaries and bays are overrun with submerged and emerged aquatic macrophytes.

Fisheries

In 1998, we hypothesized that there could be a significant difference in relative abundance results if we increased the sampling effort. Twenty-two more hours were spent electroshocking and two hundred and ninety-one more hours were spent gillnetting in 1998 than in 1997. We sampled approximately 7,800 fish in 1998 and 5,200 in 1997. The 1998 data reiterated the findings from 1994-1996 (Peters et. al. 1999) and 1997. Thus, we saw no significant difference in relative abundance by increasing our sampling effort. Species composition remained the same even though more fish were sampled.

Four out of the top six sampled species are non-native species. Northern pikeminnow and largescale suckers are the only native fish sampled in the top six. Northern pikeminnow make up 8-9% of the electroshocking catch and 18-20% of the gillnet catch. Largescale suckers make up 24-28% of the electroshocking catch and 9-21% of the gillnet catch. Cutthroat trout and mountain whitefish make up less than 1% of the catch when electroshocking and about 1.4% of the gillnet catch. When Post Falls Dam went on line in 1903 it inundated over 10 square kilometers of shoreline. This created prime habitat for exotic and non-salmonid native fish species.

Since 1994 the Coeur d'Alene Tribe Fish, Water and Wildlife program has conducted an extensive mark-recapture study (Peters et al. 1999). To date 636 fish have been tagged, there have been 23 recaptures between the Fish, Water and Wildlife program and anglers and anglers have harvested 15 fish. Eleven out of the 21 species have been tagged. The mark-recapture study relies heavily on the effectiveness of our sample gear and on angler's participation. We realize these results are biased because not all anglers report their catch, tags can be removed by anglers and they can fall out. During the 1997 and 1998 field season all game fish that were 300 mm and 300 g received a floy tag. Through the mark-recapture study we are finding that northern pike have a tendency to migrate from the original sampling site and largemouth bass are very territorial rarely moving from the site where they were tagged. It appears that both northern pike and largemouth tend to occupy shoreline habitat areas.

In general, northern pike are fairly sedentary, establishing a vague territory where cover and food are adequate (Scott and Crossman, 1973). Normally, this would be true because northern pike found on the northern end of Coeur d'Alene Lake tend not to migrate (Personal communication with Ned Horner IDF&G). However, northern pike in the southern 1/3 of Coeur d'Alene Lake appear to migrate over larger distances than would be normally expected. For example, a northern pike was sampled in September of 1997 in Chatcolet Lake and was harvested in March of 1998 in waters off of Harlow Point. This fish traveled approximately eight miles up the lake. Another northern pike was sampled in October of 1998 in O'Gara Bay and was harvested in March of 1999 in Chatcolet Lake; this fish migrated approximately 2-3 miles in a southerly direction. The reason we might be seeing this movement is due to the size of the littoral zone in the southern 1/3 of Coeur d'Alene Lake relative to the rest of the lake. When Post Falls Dam was built it raised Coeur d'Alene Lake by 3.6 m. This affected the southern 1/3 of

Coeur d'Alene Lake by turning small isolated lakes into a continuous body of water with Coeur d'Alene Lake. Because the inundated area has an average depth of 3.6 m or less, this led to the growth of aquatic macrophytes and suitable habitat for introduced non-native species. Due to the shallowness and the warm water temperatures in the southern 1/3 and near by bays of Coeur d'Alene Lake, northern pike tend not to restrict themselves to a specific forage area.

Scott and Crossman (1973) state that largemouth bass movement is not extensive usually less than five miles and summer territories are small. The majority of the largemouth bass in the southern 1/3 of Coeur d'Alene Lake appear to migrate less than one mile. A largemouth bass was originally sampled using electroshocking equipment in October of 1994 in Shingle Bay. The Fish, Water and Wildlife program sampled the same largemouth bass again in August of 1996 and June of 1998 in Shingle Bay. An example where anglers have played an important role in our mark-recapture study is with a largemouth that was sampled by the Fish, Water and Wildlife program in August of 1996 in O'Gara Bay. The same bass was caught and released in September of 1996 by an angler and was recently harvested in June of 1999 in O'Gara Bay by another angler.

Out of the 21 species inhabiting Coeur d'Alene Lake seven species have been shown to actively feed on cutthroat trout. They are chinook salmon, northern pike, northern pikeminnow, largemouth and smallmouth bass, bull trout and channel catfish. Of the non-native predators smallmouth bass are the newest addition. Smallmouth were illegally introduced into the northern part of Coeur d'Alene Lake. Peters et al. (1999) showed that during 1994- 1996 smallmouth bass were not sampled by electroshocking or gillnetting methods. In 1997 two smallmouth bass were sampled in waters off of Harlow Point. Current data is showing a gradual increase in smallmouth bass numbers in the littoral zone from Windy Bay south to O'Gara Bay where seventeen smallmouth were sampled during the 1998 field season. Most likely these fish will be found throughout the Coeur d'Alene system in a few years.

Smallmouth bass actively feed on crayfish and small fish from the age of two and older (Simpson and Wallace 1982). This could prove detrimental to cutthroat trout since they will occupy some of the same habitat as the smallmouth bass upon entry into the lake. The introduction of smallmouth bass may also have an effect on the existing largemouth bass population to what extent we do not know. This will be monitored in the future. Scott and Crossman (1973) state that the habitats of the smallmouth and largemouth bass seldom overlap even though the two species often occur in the same lake. Smallmouth prefer colder water than largemouth and they prefer rocky and sandy areas to the largemouth's vegetation habitat. Prior to the introduction of smallmouth into Coeur d'Alene Lake largemouth bass occupied some of the habitat currently occupied by smallmouth bass. This expansion of the smallmouth bass population could reduce the abundance of largemouth bass in certain parts of its former range within Coeur d'Alene Lake. The program will continue to monitor this in the future.

Kokanee salmon are not considered a predator on cutthroat trout but they may compete with the cutthroat for habitat and, on occasion, food. Kokanee in Coeur d'Alene Lake inhabit the middle to bottom layers of the limnetic zone, with the majority being sampled in the middle of the water column. Kokanee usually inhabit the upper and middle layers of the open lake (Scott and Crossman, 1973). According to our data cutthroat trout inhabit the bottom and middle layers of Coeur d'Alene Lake, thus it appears that these two species habitats over lap. Kokanee are mainly a pelagic, plankton feeder but it may derive a significant portion of its food from bottom organisms (Scott and Crossman, 1973). Cutthroat trout tend to be opportunistic in their food habits and are not highly piscivorous; instead they tend to specialize as invertebrate feeders (Roscoe 1974; Behnke 1979) thus, it is unlikely that they compete for food. However, Marnell (1988) determined that declines in westslope cutthroat trout populations in lakes in Glacier National Park where kokanee were introduced were caused by competition for planktivorous food. Unlike Marnell who showed that cutthroat trout numbers declined in the presents of kokanee salmon, in Coeur d'Alene Lake cutthroat trout and kokanee salmon are co-existing. The productivity of the low elevation lakes compared to the non-productive high mountain lakes is a possible reason for co-existence. The low elevation lakes provide greater abundance and more diverse food than the high mountain lakes.

The majority of cutthroat trout are sampled at night as they come inshore to feed. A possible reason for sampling more cutthroat trout at night is that the water temperature cools enough to allow them to come to the surface to forage for food. The age structure of the cutthroat trout we sample in the littoral zone range from 2-6 and the age structure of the cutthroat trout in the limnetic zone are 3-5. Our age data is slightly biased towards older fish. Age 0 & 1 fish from all species is lacking representation in our sampling efforts. Juvenile cutthroat trout rear in local tributaries for two years so it is not surprising that they are, absent from our lucustrine sampling efforts. In order to examine this hypothesis we are initiating a beach seine sampling project around the lake in order to try and capture fish not susceptible to our electrofishing or gillnet capture methods.

4.2 Stream Studies

Spawning Habitat

Other studies have documented low-order tributaries as important spawning habitat for cutthroat trout (Rieman and Apperson 1989, Magee et al. 1996). Previous work on the Coeur d'Alene Reservation suggests that this holds true for our target tributaries as well (Peters et al 1999). In a 1997 study, adfluvial cutthroat trout were fitted with radio tags and tracked to spawning areas located in 2nd order tributaries within the Benewah Creek watershed. Spawning activity has been observed in the West Fork, a 2nd order tributary of Benewah Creek, for the past 4 years. Additionally, young of the year cutthroat are most often found in association with 2nd order tributaries in all target watersheds. The close association between redd distribution and density of juvenile and adults has been reported by other investigators (Beard and Carline 1991). Therefore, we feel that the effort to map the abundance and distribution of gravels within 2nd order tributaries should provide a good index of spawning potential for the respective watersheds.

The mapped distribution of potentially suitable spawning substrate within the spawning reaches of four target tributaries on the Coeur d'Alene Reservation was patchy and did not vary considerably within reaches or between watersheds (Figure 3.12). Furthermore, the quantity of spawning gravel was low, averaging just 4.1% of measured stream area. These results lie in contrast with those of Magee (1996), who reported a wide variance in proportion of spawning gravel for a Montana stream basin, even among nearby reaches, and documented much higher proportions of suitable spawning substrate (up to 25%). The lack of a strong association between spawning gravel abundance and several reach characteristics (gradient, proportion of gravel and pea gravel) in this study, however, corroborates the findings of Magee (1996), who suggested that local hydrologic features influenced spawning gravel availability. Although the distribution of spawning substrate was patchy within the target watersheds, there is probably adequate habitat to support resident and adfluvial spawners because of currently depressed numbers.

Abundance of potential spawning gravels has been reported as a key factor influencing redd density for westslope cutthroat trout at the reach scale (Magee et al. 1996). Similar relations between redd density and availability of spawning gravel were noted by Cope (1957) for Yellowstone cutthroat trout and by Beard and Carline (1991) for brown trout. Other important factors in determining redd density probably include temperature and fish density. Current population estimates for the target tributaries indicate wide variation in the abundance of juvenile fish (Figure 3.14), even though water temperatures and availability of spawning gravels are similar. Although redd densities were not estimated as part of this study, it is thought that fish density overrides other variables in determining redd density across the entire basin. Given the observed abundance and distribution of suitable spawning gravels in the target watersheds, redd superimposition could occur at relatively low population densities. This could have profound implications on projections for juvenile recruitment if the number of spawning adults increases over time, either as a result of improved juvenile to adult survival or initiation of a supplementation program. In any case, it would be prudent to monitor spawning activity to look for evidence of superimposition.

Is fine sediment limiting recruitment?

Spawning gravels in target tributaries of the Reservation contained proportions of fine sediments comparable to those in egg pockets of salmonid redds in the Rocky Mountain region (Table 4.1). Sites in Alder, Benewah and Evans Creeks contained low proportions of fines that were reflective of stable habitats and low impact landuses. The erosive geology of the Lake Creek watershed, on the other hand, results in substrate conditions similar to those reported by Magee et al. (1996) in Montana. The proportion of small fines (<0.85 mm) averaged two to 20 times higher than in spawning gravels elsewhere on the Reservation.

Table 4.1 Mean proportion of fines smaller than 6.35 mm and 0.85 mm and the mean fredle index (F_i) of egg pockets in salmonid redds from the Rocky Mountain region, USA.

Target species	Location	Time of sampling	Percent fines Smaller than: 6.35 mm	Percent fines Smaller than: 0.85 mm	F_i	N	Reference
Cutthroat	Alder Creek	Post emergence	17.8	1.0	7.8	5	This study*
Cutthroat	Benewah Creek	Post emergence	22.8	3.7	7.1	9	This study*
Cutthroat	Evans Creek	Post emergence	18.6	0.5	8.8	8	This study*
Cutthroat	Lake Creek	Post emergence	44.0	10.1	4.5	7	This study*
Cutthroat	Idaho	Near emergence	24.4	6.5	7.6	13	R. Thurow and J. King unpublished data
Cutthroat	Montana	Near emergence	41.6	17.9	2.0	11	Magee et al. (1996)
Cutthroat	Montana	Near emergence	27.4	5.9		13	Weaver and Fraley (1993)
Steelhead	Idaho	Near emergence	15.4	3.7	10.5	9	R. Thurow and J. King unpublished data
Brook	Wyoming	Near spawning	12.1	6.4		31	Young et al. (1989)
Brook	Wyoming	Near spawning	15.0	3.0		69	Grost et al. (1991)

*Means calculated from suitable spawning gravels rather than egg pockets for this study.

Several factors may account for reported differences in gravel characteristics, including sampling method, geology, and sediment transport. Other investigators have sampled egg pockets, noting significantly lower concentrations of fines in the upper strata when compared with nearby gravels (Chapman 1988, Young et al. 1989). Because we were unable to identify actual redds to sample, our results are most likely representative of unaltered spawning substrate or unstratified redd samples, as described by Young et al. (1989). The timing of sampling effort also may have resulted in some particle size differences. We sampled spawning gravels as late as four weeks after emergence, whereas some authors sampled egg pockets near spawning or at the time of emergence. Streams on the Reservation, however, carry little sediment during the incubation period for embryos because flows (and hence sediment transport) rapidly decline during spring and early summer.

At 23 of 29 sample sites, low levels of fine sediment led to high predictions of overall embryo survival (mean = 28.4%). The estimates of fry production potential for all sample sites ranged widely (0.0 to 31.2 fry/100 square meters) due, primarily, to the quantity of suitable gravels present (Table 3.13). Our estimates of emergence success were made by using proportions of fine sediment less than 6.35 mm in diameter, based on the experiments of Weaver and Fraley (1993) with artificial egg pockets planted in stream substrate. Actual emergence success may be lower in tributaries of Lake Creek and portions of South East Benewah Creek, where high proportions of small fines (<0.85 mm) were measured. Small fines are more detrimental to survival of incubating eggs and intrude deeper into spawning gravels than coarser fines (Reiser and White 1988, Beschta and Jackson 1979). Only in the mainstem of Lake Creek were the proportions of both small and coarse fines considered above the levels for these particle sizes

(10% and 30%, respectively) shown to adversely affect salmonid emergence success (McNeil and Ahnell 1964, Shepard et al. 1984a, Cederhom and Reid 1987, Reiser and White 1988).

Previous studies have demonstrated that reduced emergence success from high sedimentation can result in low juvenile densities and low adult recruitment (Cederholm and Reid 1987, Scrivener and Brownlee 1989). Of the 6 sites where high levels of small or coarse fines were recorded, only the sites located in the mainstem of Lake Creek showed supporting evidence for low recruitment. The other sites had juvenile and adults densities (range = 12.4 – 33.8/100 square meters) that were notably higher than the average density (9.2/100 square meters) reported for seven other westslope cutthroat trout populations in Idaho and Montana (Shepard et al. 1984b, Ireland 1993). Several factors may buffer the effects of high sedimentation of redds. High fry mortality is common in resident salmonids, but low fry densities may result in decreased competition, increased growth, and compensatory survival (McFadden 1969). Three additional spawning tributaries (School House Creek, Whitetail Creek, and Rainbow Fork Evans Creek) showed evidence of low recruitment; however this is probably attributable to low numbers of spawning adults, low quantity of suitable gravels, or poor water quality conditions, rather than sedimentation of redds.

Population Trends

Due to the persistence of adverse water quality and habitat conditions in Reservation streams, cutthroat trout populations are thought to be at least moderately damaged (i.e. average spawning escapements fall between the minimum viable population and the number of adults needed to produce 50% of the carrying capacity of the stream environment). Reiman and Apperson (1989) estimated that populations considered as "strong" (greater than or equal to 50% of historic potential) by Idaho Department of Fish and Game (IDFG) remained in only 11% of the historic range within the State of Idaho. In contrast, none of the populations on the Coeur d'Alene Indian Reservation are considered "strong".

Mean annual population estimates from 1996-1998 rank Benewah Creek, Lake Creek, Evans Creek, and then Alder Creek in order of decreasing population strength (Table 4.2). In Benewah Creek, four tributaries, comprising 32% of the usable stream area in the watershed, have cutthroat trout densities that are notably higher than the average density (9.2/100 square meters) reported for seven other westslope cutthroat trout populations in Idaho and Montana (Shepard et al. 1984b, Ireland 1993). In Lake Creek, 41% of the perennial stream area supports higher than average densities, while 26% of the stream area in Evans Creek supports higher than average densities. All reaches in the Alder Creek drainage have significantly lower than average densities.

The probability of persistence, as shown in table 4.2, was calculated based on methods described by Reiman and McIntyre (1993), but should be used only as an index of population resiliency. When used in this manner, probability of persistence improves as population size increases or when the inter-annual variance in population size decreases. Populations in Lake Creek and Benewah Creek demonstrate the most resiliency of our target stocks, because of both higher numbers of individuals and relatively low variances.

Despite the apparent instability of cutthroat trout populations, preliminary genetic analyses show that relatively pure stocks exist in Reservation waters. A study by Spruell et al. (1999) differentiated westslope cutthroat trout, rainbow trout and their hybrids at 16 sample sites. Six sites contained samples of westslope cutthroat trout with no evidence of hybridization. The remaining ten sites included at least one hybrid individual. When present, hybridization occurs at a low level and most likely represents episodic events of migration into these systems by rainbow trout or hybrid individuals. Thus, it appears that even though the populations are not "strong", they are not threatened to a large extent with hybridization. These weakened populations may be particularly susceptible to normal environmental variability (such as temperature and stream discharge patterns) and to the frequency of extreme events such as wildfires, floods, or debris torrents. However, the existing genetic diversity may continue to allow for genetic combinations that permit survival in highly variable environments. Implications are that if the effect of limiting factors can be reduced, then genetically pure populations would have a chance to recover.

Table 4.2. Mean annual population estimates, the estimated mean annual variance in the infinitesimal rate of population growth, and probabilities of persistence over 100 years for westslope cutthroat trout populations monitored on the Coeur d'Alene Reservation. The 95% confidence interval is shown in parentheses.

Stream	Years	Mean Annual Population Estimate	Variance	Probability Of Persistence
Alder Creek	3	808	0.03 (0.02-0.04)	0.58
Benewah Creek	3	5,553	0.16 (0.04-0.36)	0.67
Evans Creek	3	2,675	0.33 (0.05-0.71)	0.45
Lake Creek	3	4,946	0.14 (0.02-0.26)	0.70

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Appendix A

Vertical hydrolab profiles of thirteen stations on Coeur d'Alene Lake, 1997 and 1998.

Appendix A.1 Vertical hydrolab profiles for thirteen sampling station on Coeur d'Alene Lake, 1997.

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Rockford Bay	1597	ASSS	4/18/97	-	1.7	11	0.4	12.58	5.64	7.34	42.4	0.03	*****	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	10	1.3	12.51	5.42	7.33	42.2	0.03	99	-	373
Rockford Bay	1597	ASSS	4/18/97	-	1.7	9	2.6	12.54	5.24	7.34	41.9	0.03	98.8	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	8	4	12.48	4.98	7.32	41.6	0.03	97.6	-	373
Rockford Bay	1597	ASSS	4/18/97	-	1.7	7	5.4	12.5	4.94	7.31	41.8	0.03	97.7	-	373
Rockford Bay	1597	ASSS	4/18/97	-	1.7	6	6.7	12.47	4.87	7.31	42.5	0.03	97.3	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	5	7.8	12.47	4.81	7.31	42.7	0.03	97.2	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	4	9	12.48	4.74	7.3	43.2	0.03	97	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	3	10.3	12.47	4.69	7.29	43.2	0.03	96.9	-	372
Rockford Bay	1597	ASSS	4/18/97	-	1.7	2	11.8	12.79	4.65	7.29	43.4	0.03	99.2	-	370
Rockford Bay	1597	ASSS	4/18/97	-	1.7	1	13	12.19	4.61	7.28	43.2	0.03	94.4	-	369
Rockford Bay	1997	DBSS	5/16/97	-	1.3	11	0.2	11.36	13.57	7.09	36.1	0.02	108.4	-	409
Rockford Bay	1997	DBSS	5/16/97	-	1.3	10	2	11.31	10.51	7.09	34.2	0.02	100.6	-	412
Rockford Bay	1997	DBSS	5/16/97	-	1.3	9	3.4	11.39	10.46	7.08	34.7	0.02	101.3	-	412
Rockford Bay	1997	DBSS	5/16/97	-	1.3	8	5	11.54	10.41	7.06	37.4	0.02	102.4	-	413
Rockford Bay	1997	DBSS	5/16/97	-	1.3	7	6.5	11.53	10.22	7.05	37.5	0.02	101.9	-	413
Rockford Bay	1997	DBSS	5/16/97	-	1.3	6	8	11.53	10	7.05	38	0.02	101.3	-	414
Rockford Bay	1997	DBSS	5/16/97	-	1.3	5	9.5	11.49	9.74	7.05	37.6	0.02	100.3	-	413
Rockford Bay	1997	DBSS	5/16/97	-	1.3	4	11	11.43	9.55	7.04	37.6	0.02	99.4	-	413
Rockford Bay	1997	DBSS	5/16/97	-	1.3	3	12.5	11.37	9.32	7.02	38.2	0.02	98.3	-	414
Rockford Bay	1997	DBSS	5/16/97	-	1.3	2	14	11.27	8.83	7.01	38.7	0.02	96.3	-	414
Rockford Bay	1997	DBSS	5/16/97	-	1.3	1	15.4	11.21	7.66	7.01	39.9	0.03	93.1	-	414
Rockford Bay	2197	DBSS	5/29/97	-	1.3	15	0.6	10.57	16.8	6.91	32.1	0.02	108.4	-	387
Rockford Bay	2197	DBSS	5/29/97	-	1.3	14	1.6	10.6	16.43	6.88	32	0.02	107.9	-	388
Rockford Bay	2197	DBSS	5/29/97	-	1.3	13	2.5	10.42	12.02	6.82	32.5	0.02	96.2	-	393
Rockford Bay	2197	DBSS	5/29/97	-	1.3	12	3.5	10.75	11.31	6.76	31	0.02	97.7	-	395
Rockford Bay	2197	DBSS	5/29/97	-	1.3	11	4.6	10.54	10.92	6.73	30.8	0.02	94.8	-	396
Rockford Bay	2197	DBSS	5/29/97	-	1.3	10	5.5	10.49	10.36	6.72	30.4	0.02	93.2	-	396
Rockford Bay	2197	DBSS	5/29/97	-	1.3	9	6.6	10.49	10.18	6.7	30.4	0.02	92.8	-	397
Rockford Bay	2197	DBSS	5/29/97	-	1.3	8	7.6	10.62	9.96	6.69	29	0.02	93.4	-	397
Rockford Bay	2197	DBSS	5/29/97	-	1.3	7	8.7	10.61	9.82	6.66	30.2	0.02	93.1	-	397
Rockford Bay	2197	DBSS	5/29/97	-	1.3	6	9.7	10.63	9.71	6.64	30.2	0.02	93	-	398
Rockford Bay	2197	DBSS	5/29/97	-	1.3	5	10.6	10.62	9.69	6.62	30.4	0.02	92.8	-	398
Rockford Bay	2197	DBSS	5/29/97	-	1.3	4	11.6	10.51	9.64	6.6	31.3	0.02	91.9	-	400
Rockford Bay	2197	DBSS	5/29/97	-	1.3	3	12.6	10.51	9.36	6.57	32	0.02	91.1	-	401
Rockford Bay	2197	DBSS	5/29/97	-	1.3	2	13.6	10.5	9.12	6.53	32.8	0.02	90.5	-	401
Rockford Bay	2197	DBSS	5/29/97	-	1.3	1	14.8	10.53	8.63	6.48	34	0.02	89.7	-	404

Rockford Bay	2397	DBAS	6/11/97	-	1.8	14	0.6	10.87	14.41	7.14	34.4	0.02	106.3	-	414
Rockford Bay	2397	DBAS	6/11/97	-	1.8	13	1.5	11.11	12.51	7.13	33.1	0.02	104.1	-	416
Rockford Bay	2397	DBAS	6/11/97	-	1.8	12	2.5	11.13	12.08	7.13	32.4	0.02	103.1	-	416
Rockford Bay	2397	DBAS	6/11/97	-	1.8	11	3.4	11.09	11.62	7.13	32	0.02	101.8	-	415
Rockford Bay	2397	DBAS	6/11/97	-	1.8	10	4.6	10.9	10.8	7.13	30.9	0.02	98.1	-	416
Rockford Bay	2397	DBAS	6/11/97	-	1.8	9	5.5	10.81	10.41	7.14	30	0.02	96.5	-	415
Rockford Bay	2397	DBAS	6/11/97	-	1.8	8	6.4	10.72	10.33	7.14	29.6	0.02	95.5	-	415
Rockford Bay	2397	DBAS	6/11/97	-	1.8	7	7.6	10.65	10.13	7.14	29.9	0.02	94.4	-	414
Rockford Bay	2397	DBAS	6/11/97	-	1.8	6	8.5	10.69	10.08	7.15	30.1	0.02	94.6	-	414
Rockford Bay	2397	DBAS	6/11/97	-	1.8	5	9.7	10.68	9.97	7.15	30.1	0.02	94.3	-	414
Rockford Bay	2397	DBAS	6/11/97	-	1.8	4	10.6	10.66	9.92	7.16	30	0.02	94.1	-	414
Rockford Bay	2397	DBAS	6/11/97	-	1.8	3	11.7	10.64	9.92	7.18	30	0.02	93.8	-	413
Rockford Bay	2397	DBAS	6/11/97	-	1.8	2	12.6	10.63	9.76	7.19	30.5	0.02	93.4	-	412
Rockford Bay	2397	DBAS	6/11/97	-	1.8	1	13.6	10.2	10.12	7.24	30.5	0.02	90.3	-	411
Rockford Bay	2597	DBSS	6/26/97	-	3.3	14	0.2	10.64	16.29	7.11	33.8	0.02	108.2	-	442
Rockford Bay	2597	DBSS	6/26/97	-	3.3	13	0.9	10.66	16.23	7.1	33.9	0.02	108.3	-	443
Rockford Bay	2597	DBSS	6/26/97	-	3.3	12	1.9	10.66	16.04	7.08	33.8	0.02	107.8	-	444
Rockford Bay	2597	DBSS	6/26/97	-	3.3	11	2.9	10.63	15.71	7.07	33.6	0.02	106.7	-	444
Rockford Bay	2597	DBSS	6/26/97	-	3.3	10	3.9	10.7	15.04	7.05	33.5	0.02	105.9	-	446
Rockford Bay	2597	DBSS	6/26/97	-	3.3	9	4.9	10.78	14.13	7.02	33.1	0.02	104.6	-	447
Rockford Bay	2597	DBSS	6/26/97	-	3.3	8	6	10.78	13.55	7	33.1	0.02	103.3	-	448
Rockford Bay	2597	DBSS	6/26/97	-	3.3	7	7	10.77	13.29	7	32.9	0.02	102.6	-	448
Rockford Bay	2597	DBSS	6/26/97	-	3.3	6	8	10.73	13.09	6.98	32.8	0.02	101.7	-	448
Rockford Bay	2597	DBSS	6/26/97	-	3.3	5	8.9	10.78	12.96	6.96	32.8	0.02	101.9	-	448
Rockford Bay	2597	DBSS	6/26/97	-	3.3	4	10	10.76	12.86	6.94	32.8	0.02	101.5	-	449
Rockford Bay	2597	DBSS	6/26/97	-	3.3	3	11	10.69	12.77	6.91	32.8	0.02	100.7	-	450
Rockford Bay	2597	DBSS	6/26/97	-	3.3	2	12	10.55	12.56	6.87	32.9	0.02	98.9	-	451
Rockford Bay	2597	DBSS	6/26/97	-	3.3	1	12.9	9.92	11.23	6.81	34	0.02	90.1	-	454
Rockford Bay	2797	DBSS	7/9/97	-	4.5	14	0.4	10.09	17.81	7.28	36.2	0.02	*****	-	381
Rockford Bay	2797	DBSS	7/9/97	-	4.5	13	1.2	10.26	16.91	7.27	36.1	0.02	*****	-	381
Rockford Bay	2797	DBSS	7/9/97	-	4.5	12	2.2	10.33	16.58	7.21	36.2	0.02	*****	-	382
Rockford Bay	2797	DBSS	7/9/97	-	4.5	11	3.2	10.35	16.38	7.17	36.1	0.02	*****	-	383
Rockford Bay	2797	DBSS	7/9/97	-	4.5	10	4.2	10.37	15.79	7.15	36.1	0.02	*****	-	383
Rockford Bay	2797	DBSS	7/9/97	-	4.5	9	5.2	10.36	15.4	7.09	35.8	0.02	*****	-	384
Rockford Bay	2797	DBSS	7/9/97	-	4.5	8	6.2	10.3	14.94	7.05	35.7	0.02	*****	-	385
Rockford Bay	2797	DBSS	7/9/97	-	4.5	7	7.2	10.01	13.61	7.02	34.8	0.02	96.9	-	385
Rockford Bay	2797	DBSS	7/9/97	-	4.5	6	8.2	9.88	13.17	7	34.9	0.02	94.7	-	385
Rockford Bay	2797	DBSS	7/9/97	-	4.5	5	9.2	9.74	12.26	6.99	34.6	0.02	91.5	-	385
Rockford Bay	2797	DBSS	7/9/97	-	4.5	4	10.2	9.68	11.16	7	35.2	0.02	88.6	-	384
Rockford Bay	2797	DBSS	7/9/97	-	4.5	3	11.1	9.79	10.66	7.03	35.5	0.02	88.5	-	382
Rockford Bay	2797	DBSS	7/9/97	-	4.5	2	12.3	9.81	10.31	7.04	35.9	0.02	88	-	380

Rockford Bay	2797	DBSS	7/9/97	-	4.5	1	13.2	10	10.02	7.09	36.4	0.02	89.1	-	377
Rockford Bay	2997	SSAS	7/23/97	-	5	14	0.2	10.78	19.13	7.56	37.2	0.02	109.3	-	398
Rockford Bay	2997	SSAS	7/23/97	-	5	13	0.9	10.82	18.87	7.56	37.1	0.02	109.2	-	398
Rockford Bay	2997	SSAS	7/23/97	-	5	12	1.9	10.96	18.2	7.56	36.8	0.02	109.1	-	398
Rockford Bay	2997	SSAS	7/23/97	-	5	11	2.8	11.01	18.05	7.57	36.8	0.02	109.3	-	396
Rockford Bay	2997	SSAS	7/23/97	-	5	10	3.9	11.02	18.03	7.53	36.7	0.02	109.3	-	396
Rockford Bay	2997	SSAS	7/23/97	-	5	9	5	11	18.01	7.48	36.7	0.02	109.1	-	395
Rockford Bay	2997	SSAS	7/23/97	-	5	8	5.9	11.01	17.9	7.44	36.8	0.02	109	-	395
Rockford Bay	2997	SSAS	7/23/97	-	5	7	6.9	10.99	17.74	7.38	36.8	0.02	108.5	-	396
Rockford Bay	2997	SSAS	7/23/97	-	5	6	7.9	10.87	17.49	7.32	36.8	0.02	106.7	-	396
Rockford Bay	2997	SSAS	7/23/97	-	5	5	8.9	11	16.68	7.24	36.6	0.02	106.1	-	395
Rockford Bay	2997	SSAS	7/23/97	-	5	4	9.9	10.77	16.38	7.16	36.5	0.02	103.2	-	396
Rockford Bay	2997	SSAS	7/23/97	-	5	3	10.9	10.68	15.74	7.08	36.3	0.02	101	-	394
Rockford Bay	2997	SSAS	7/23/97	-	5	2	11.9	10.59	15.24	7	36.2	0.02	99.1	-	389
Rockford Bay	2997	SSAS	7/23/97	-	5	1	12.9	10.21	14.03	6.91	35.8	0.02	93	-	385
Rockford Bay	3197	DBSS	8/5/97	-	7.7	14	0.5	9.03	23.66	7.42	41.2	0.03	105.1	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	13	1.1	9.11	23.37	7.42	41	0.03	105.5	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	12	2.1	9.24	23.08	7.39	40.8	0.03	106.5	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	11	3.1	9.29	22.99	7.36	40.6	0.03	106.5	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	10	4.1	9.3	22.86	7.34	40.4	0.03	106.7	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	9	5.1	9.34	22.66	7.29	40.3	0.03	106.8	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	8	6.1	9.53	21.58	7.27	39.4	0.03	106.7	-	365
Rockford Bay	3197	DBSS	8/5/97	-	7.7	7	7.1	9.52	21.44	7.14	39.5	0.03	106.3	-	369
Rockford Bay	3197	DBSS	8/5/97	-	7.7	6	8.1	9.85	19.73	7.05	37.9	0.02	106.4	-	372
Rockford Bay	3197	DBSS	8/5/97	-	7.7	5	9.1	9.99	15.56	6.85	34.6	0.02	99	-	379
Rockford Bay	3197	DBSS	8/5/97	-	7.7	4	10.1	9.29	12.25	6.69	34	0.02	85.5	-	382
Rockford Bay	3197	DBSS	8/5/97	-	7.7	3	11.1	9.15	10.74	6.63	34.4	0.02	81.3	-	383
Rockford Bay	3197	DBSS	8/5/97	-	7.7	2	12.1	9.18	10.3	6.61	34.8	0.02	80.8	-	381
Rockford Bay	3197	DBSS	8/5/97	-	7.7	1	13.1	9.08	10.02	6.57	35.4	0.02	79.4	-	385
Rockford Bay	3297	DBSS	8/14/97	-	8	14	0.3	8.54	22.49	7.43	42.7	0.03	97.9	-	378
Rockford Bay	3297	DBSS	8/14/97	-	8	13	1.7	8.55	22.45	7.37	42.7	0.03	97.9	-	379
Rockford Bay	3297	DBSS	8/14/97	-	8	12	2.7	8.65	22.25	7.35	41.9	0.03	98.8	-	380
Rockford Bay	3297	DBSS	8/14/97	-	8	11	3.7	8.68	22.06	7.33	41.1	0.03	98.7	-	379
Rockford Bay	3297	DBSS	8/14/97	-	8	10	4.7	8.67	21.88	7.28	41.2	0.03	98.2	-	381
Rockford Bay	3297	DBSS	8/14/97	-	8	9	5.7	8.62	21.69	7.19	41.3	0.03	97.3	-	384
Rockford Bay	3297	DBSS	8/14/97	-	8	8	6.7	8.64	21.35	7.13	41.3	0.03	97	-	385
Rockford Bay	3297	DBSS	8/14/97	-	8	7	7.7	8.72	20.58	7.04	39.5	0.03	96.3	-	388
Rockford Bay	3297	DBSS	8/14/97	-	8	6	8.7	9.23	17.2	6.92	36.6	0.02	95.2	-	395
Rockford Bay	3297	DBSS	8/14/97	-	8	5	9.7	9.25	16.24	6.87	35.9	0.02	93.6	-	397
Rockford Bay	3297	DBSS	8/14/97	-	8	4	10.7	9.12	14.81	6.84	35.3	0.02	89.4	-	398
Rockford Bay	3297	DBSS	8/14/97	-	8	3	11.7	9.02	13.12	6.82	34.9	0.02	85.2	-	399

Rockford Bay	3297	DBSS	8/14/97	-	8	2	12.8	8.61	12.44	6.79	35.3	0.02	80.2	-	401
Rockford Bay	3297	DBSS	8/14/97	-	8	1	13.7	8.22	10.67	6.81	36.1	0.02	73.5	-	401
Rockford Bay	3497	DBSS	8/27/97	-	8.5	14	0.3	9.16	21.23	7.43	47.7	0.03	102.6	-	372
Rockford Bay	3497	DBSS	8/27/97	-	8.5	13	1.2	9.17	21.23	7.39	47.6	0.03	102.7	-	373
Rockford Bay	3497	DBSS	8/27/97	-	8.5	12	2.2	9.19	21.16	7.37	47.8	0.03	102.9	-	374
Rockford Bay	3497	DBSS	8/27/97	-	8.5	11	3.1	9.23	21.11	7.35	47.8	0.03	103.1	-	374
Rockford Bay	3497	DBSS	8/27/97	-	8.5	10	4.1	9.24	21.06	7.31	47.9	0.03	103.4	-	375
Rockford Bay	3497	DBSS	8/27/97	-	8.5	9	5.2	9.21	21	7.26	47.7	0.03	102.8	-	377
Rockford Bay	3497	DBSS	8/27/97	-	8.5	8	6.1	9.19	20.91	7.18	47.8	0.03	102.3	-	380
Rockford Bay	3497	DBSS	8/27/97	-	8.5	7	7.2	9.17	20.76	7.09	47.7	0.03	101.8	-	383
Rockford Bay	3497	DBSS	8/27/97	-	8.5	6	8.2	9.26	18.17	6.96	42.3	0.03	97.6	-	389
Rockford Bay	3497	DBSS	8/27/97	-	8.5	5	9.2	9.23	16.83	6.9	40.5	0.03	94.8	-	392
Rockford Bay	3497	DBSS	8/27/97	-	8.5	4	10.2	9.09	15.66	6.82	39.7	0.03	90.9	-	396
Rockford Bay	3497	DBSS	8/27/97	-	8.5	3	11.3	8.94	14.06	6.79	39.1	0.03	86.3	-	398
Rockford Bay	3497	DBSS	8/27/97	-	8.5	2	12.3	8.74	11.82	6.76	39	0.03	80.4	-	400
Rockford Bay	3497	DBSS	8/27/97	-	8.5	1	13.2	8.8	11.23	6.78	39.2	0.03	79.8	-	400
Rockford Bay	3797	ASRP	9/17/97	-	8	13	0.2	9.33	16.91	7.31	48.4	0.03	97.3	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	12	1.8	9.34	16.9	7.31	48.5	0.03	97.5	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	11	2.8	9.33	16.89	7.31	48.4	0.03	97.3	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	10	3.8	9.33	16.86	7.3	48.4	0.03	97.3	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	9	4.8	9.35	16.85	7.31	48.4	0.03	97.5	-	391
Rockford Bay	3797	ASRP	9/17/97	-	8	8	5.8	9.33	16.83	7.29	48.5	0.03	97.2	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	7	6.8	9.34	16.82	7.29	48.3	0.03	97.4	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	6	7.8	9.35	16.8	7.28	48.5	0.03	97.6	-	392
Rockford Bay	3797	ASRP	9/17/97	-	8	5	8.8	9.34	16.63	7.27	47.7	0.03	96.9	-	393
Rockford Bay	3797	ASRP	9/17/97	-	8	4	9.8	9.31	16.6	7.25	47.6	0.03	96.5	-	393
Rockford Bay	3797	ASRP	9/17/97	-	8	3	10.8	9.37	16.55	7.25	47.4	0.03	97.1	-	394
Rockford Bay	3797	ASRP	9/17/97	-	8	2	11.8	9.34	16.36	7.26	46.8	0.03	96.5	-	393
Rockford Bay	3797	ASRP	9/17/97	-	8	1	12.8	9.38	16.33	7.25	46.6	0.03	96.8	-	393
Rockford Bay	3997	ASRA	9/29/97	-	8.2	10	0.2	9.72	15.81	7.19	43.5	0.03	99.1	-	446
Rockford Bay	3997	ASRA	9/29/97	-	8.2	9	1	9.68	15.72	7.18	43.6	0.03	98.5	-	446
Rockford Bay	3997	ASRA	9/29/97	-	8.2	8	2.5	9.66	15.67	7.15	43.6	0.03	98.2	-	447
Rockford Bay	3997	ASRA	9/29/97	-	8.2	7	4	9.65	15.61	7.12	43.6	0.03	98	-	447
Rockford Bay	3997	ASRA	9/29/97	-	8.2	6	5.5	9.58	15.54	7.1	43.5	0.03	97.1	-	447
Rockford Bay	3997	ASRA	9/29/97	-	8.2	5	7	9.52	15.36	7.06	43.6	0.03	96	-	448
Rockford Bay	3997	ASRA	9/29/97	-	8.2	4	8.5	9.48	15.19	7.04	43.6	0.03	95.4	-	447
Rockford Bay	3997	ASRA	9/29/97	-	8.2	3	10	9.44	15.13	6.98	43.6	0.03	94.9	-	446
Rockford Bay	3997	ASRA	9/29/97	-	8.2	2	11.3	9.51	14.94	6.95	43.6	0.03	95.1	-	444
Rockford Bay	3997	ASRA	9/29/97	-	8.2	1	12.8	9.42	14.71	6.89	43.5	0.03	93.8	-	441
Rockford Bay	4297	DBAS	10/21/97	-	7.5	12	0.4	10.03	12.41	7.16	48.2	0.03	92.9	-	396

Rockford Bay	4297	DBAS	10/21/97	-	7.5	11	1.8	10.02	12.41	7.13	48.2	0.03	92.9	-	398
Rockford Bay	4297	DBAS	10/21/97	-	7.5	10	2.8	10.02	12.41	7.13	48.2	0.03	92.9	-	397
Rockford Bay	4297	DBAS	10/21/97	-	7.5	9	3.8	10.02	12.41	7.12	48.2	0.03	92.9	-	398
Rockford Bay	4297	DBAS	10/21/97	-	7.5	8	4.8	10.02	12.41	7.09	48.3	0.03	92.9	-	399
Rockford Bay	4297	DBAS	10/21/97	-	7.5	7	5.9	10.02	12.41	7.09	48.2	0.03	92.9	-	399
Rockford Bay	4297	DBAS	10/21/97	-	7.5	6	6.8	10.02	12.41	7.07	48.3	0.03	92.9	-	399
Rockford Bay	4297	DBAS	10/21/97	-	7.5	5	7.8	10.04	12.41	7.04	48.3	0.03	93	-	400
Rockford Bay	4297	DBAS	10/21/97	-	7.5	4	8.8	10.04	12.41	7.02	48.3	0.03	92.9	-	400
Rockford Bay	4297	DBAS	10/21/97	-	7.5	3	9.8	10.02	12.41	7	48.2	0.03	92.9	-	401
Rockford Bay	4297	DBAS	10/21/97	-	7.5	2	11.8	10.03	12.4	6.93	48.2	0.03	92.9	-	402
Rockford Bay	4297	DBAS	10/21/97	-	7.5	1	12.8	10.05	12.38	6.88	48.3	0.03	93	-	404
Rockford Bay	4497	DBAS	11/4/97	-	7.2	13	0.3	10.68	10.28	7.1	46.8	0.03	94.4	39	420
Rockford Bay	4497	DBAS	11/4/97	-	7.2	12	1.7	10.69	10.15	7.07	46.9	0.03	94.1	41	423
Rockford Bay	4497	DBAS	11/4/97	-	7.2	11	2.7	10.66	10.14	7.08	46.9	0.03	93.9	46	422
Rockford Bay	4497	DBAS	11/4/97	-	7.2	10	3.8	10.67	10.12	7.07	47	0.03	93.9	122	423
Rockford Bay	4497	DBAS	11/4/97	-	7.2	9	4.7	10.73	10.09	7.04	46.8	0.03	94.4	50	425
Rockford Bay	4497	DBAS	11/4/97	-	7.2	8	5.8	10.66	10.09	7.05	46.9	0.03	93.8	49	424
Rockford Bay	4497	DBAS	11/4/97	-	7.2	7	6.7	10.66	10.07	7	46.9	0.03	93.7	101	427
Rockford Bay	4497	DBAS	11/4/97	-	7.2	6	7.7	10.66	10.07	7	46.9	0.03	93.7	108	427
Rockford Bay	4497	DBAS	11/4/97	-	7.2	5	8.7	10.66	10.05	7.01	47	0.03	93.7	124	427
Rockford Bay	4497	DBAS	11/4/97	-	7.2	4	9.7	10.72	10	6.99	47	0.03	94	101	428
Rockford Bay	4497	DBAS	11/4/97	-	7.2	3	10.7	10.75	10	6.95	47.2	0.03	94.3	42	431
Rockford Bay	4497	DBAS	11/4/97	-	7.2	2	11.7	10.71	9.99	6.96	47.2	0.03	93.9	53	430
Rockford Bay	4497	DBAS	11/4/97	-	7.2	1	12.6	10.66	9.99	6.88	47.2	0.03	93.5	730	434

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	10	0.2	12.97	5.69	7.39	42.6	0.03	*****	-	388
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	9	1.4	12.96	5.67	7.39	42.7	0.03	*****	-	388
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	8	2.5	12.99	5.62	7.38	42.7	0.03	*****	-	389
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	7	3.7	12.97	5.6	7.37	42.9	0.03	*****	-	389
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	6	5.2	12.93	5.52	7.37	43.1	0.03	*****	-	389
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	5	6.5	12.95	5.52	7.36	43.2	0.03	*****	-	390
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	4	7.8	12.95	5.47	7.36	42.8	0.03	*****	-	390
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	3	9.1	12.91	5.46	7.36	43.1	0.03	*****	-	390
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	2	10.5	12.89	5.42	7.35	43.3	0.03	*****	-	391
Windy Bay Shallow	1597	ASSS	4/18/97	-	1.4	1	11.9	12.85	5.22	7.36	43.7	0.03	*****	-	392
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	13	0.2	11.48	12.43	7.03	21	0.01	106.8	-	420
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	12	1.1	11.6	11.46	7	36.7	0.02	105.4	-	427
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	11	2.6	11.6	10.94	6.95	36	0.02	104.2	-	431
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	10	4.1	11.39	10.15	6.9	34.8	0.02	100.4	-	433

Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	9	5.6	11.34	9.74	6.89	35.3	0.02	99	-	433
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	8	7.1	11.39	9.53	6.86	36.5	0.02	99	-	434
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	7	8.6	11.4	9.15	6.84	38.2	0.02	98.2	-	434
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	6	10.1	11.38	8.69	6.81	38.7	0.02	97.1	-	435
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	5	11.6	11.36	8.17	6.8	40.8	0.03	95.5	-	436
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	4	13.1	11.34	8.04	6.77	41.4	0.03	95	-	436
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	3	14.6	11.45	7.47	6.76	43.4	0.03	94.6	-	437
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	2	16.1	11.4	7.19	6.73	43.4	0.03	93.5	-	437
Windy Bay Shallow	1997	DBSS	5/16/97	-	1.75	1	17.6	11.5	7.02	6.69	43.6	0.03	94	-	436
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	16	0.5	10.7	16.3	7.03	31.5	0.02	108.5	-	382
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	15	1.5	10.69	16.23	7.01	31.5	0.02	108.3	-	382
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	14	2.4	10.74	15.76	6.99	31.5	0.02	107.7	-	383
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	13	3.5	10.76	14.11	6.93	30.9	0.02	104.1	-	386
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	12	4.5	9.97	12.69	6.86	31.2	0.02	93.5	-	389
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	11	5.6	10.42	11.36	6.88	29.9	0.02	94.7	-	389
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	10	6.5	10.43	10.68	6.87	29.5	0.02	93.3	-	389
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	9	7.4	10.48	10.5	6.87	29.4	0.02	93.3	-	389
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	8	8.5	10.52	10.33	6.87	29.6	0.02	93.3	-	389
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	7	9.5	10.5	9.97	6.85	29.4	0.02	92.4	-	390
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	6	10.6	10.45	9.09	6.85	30.4	0.02	90	-	390
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	5	11.5	10.37	8.97	6.84	30.6	0.02	89.1	-	391
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	4	12.6	10.26	8.83	6.84	31.1	0.02	87.8	-	390
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	3	13.6	10.34	8.61	6.84	31.7	0.02	88.1	-	391
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	2	14.6	10.31	8.42	6.84	32.7	0.02	87.4	-	391
Windy Bay Shallow	2197	DBSS	5/29/97	-	1.5	1	15.5	10.34	8.27	6.84	33.3	0.02	87.3	-	391
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	16	0.5	10.8	13.95	7.02	34.9	0.02	104.5	-	423
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	15	1.4	10.67	12.79	7.01	34.6	0.02	100.6	-	425
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	14	2.3	10.89	11.64	6.98	32.6	0.02	100	-	426
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	13	3.3	10.84	11.1	6.98	32	0.02	98.3	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	12	4.4	10.74	10.53	6.98	32.5	0.02	96.1	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	11	5.3	10.78	10.22	6.97	30.8	0.02	95.8	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	10	6.3	10.69	10.04	6.97	30.5	0.02	94.7	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	9	7.5	10.66	9.96	6.96	30.6	0.02	94.3	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	8	8.3	10.58	9.89	6.96	31	0.02	93.3	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	7	9.5	10.63	9.66	6.96	30.9	0.02	93.2	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	6	10.4	10.6	9.63	6.96	31.4	0.02	92.8	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	5	11.6	10.61	9.5	6.96	31.5	0.02	92.7	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	4	12.5	10.61	9.32	6.95	32	0.02	92.2	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	3	13.6	10.56	9.1	6.95	33	0.02	91.3	-	427
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	2	14.7	10.65	8.68	6.95	34.5	0.02	91.1	-	428
Windy Bay Shallow	2397	DBAS	6/11/97	-	2	1	15.7	10.64	8.66	6.96	34.7	0.02	91	-	427

Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	16	0.4	10.71	14.84	7.13	35.5	0.02	105.6	-	440
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	15	0.8	10.71	14.83	7.14	35.4	0.02	105.5	-	438
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	14	1.7	10.72	14.74	7.11	35.4	0.02	105.5	-	440
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	13	2.7	10.74	14.21	7.11	35.4	0.02	104.4	-	440
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	12	3.7	10.81	13.65	7.09	34.9	0.02	103.8	-	441
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	11	4.7	10.83	13.22	7.08	34.3	0.02	103	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	10	5.6	10.82	12.61	7.08	34	0.02	101.4	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	9	6.5	10.8	12.73	7.07	34	0.02	101.4	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	8	7.9	10.81	12.12	7.05	33.5	0.02	100.2	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	7	8.5	10.77	12.05	7.05	33.6	0.02	99.8	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	6	9.7	10.81	11.61	7.04	33.5	0.02	99.1	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	5	10.6	10.82	11.56	7.04	33.4	0.02	99.1	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	4	11.5	10.79	11.41	7.03	33.7	0.02	98.4	-	442
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	3	12.5	10.78	11.2	7.03	33.7	0.02	97.9	-	441
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	2	13.6	10.81	11.12	7.03	33.7	0.02	98	-	441
Windy Bay Shallow	2597	DBSS	6/26/97	-	2.2	1	14.8	10.78	11.02	7.05	33.5	0.02	97.5	-	440
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	16	0.4	10.28	16.6	7.25	37.3	0.02	*****	-	411
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	15	1.1	10.28	16.59	7.24	37.3	0.02	*****	-	412
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	14	2	10.29	16.55	7.2	37.3	0.02	*****	-	414
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	13	2.9	10.28	16.53	7.18	37.3	0.02	*****	-	414
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	12	3.9	10.28	16.32	7.15	37.4	0.02	*****	-	414
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	11	5	10.39	15.56	7.12	36.7	0.02	*****	-	416
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	10	6	10.4	15.31	7.1	36.5	0.02	*****	-	416
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	9	7	10.35	15.03	7.06	36.8	0.02	*****	-	417
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	8	8	10.35	14.51	7.06	36	0.02	*****	-	418
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	7	9	10.3	14.21	7.03	36.3	0.02	*****	-	418
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	6	10.1	10.19	13.65	6.99	35.2	0.02	98.7	-	419
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	5	11	10.04	13.32	6.94	35.3	0.02	96.5	-	420
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	4	12	9.95	12.79	6.93	34.7	0.02	94.5	-	421
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	3	13	9.66	11.92	6.9	34.9	0.02	90	-	423
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	2	14	9.5	10.12	6.9	36.4	0.02	84.8	-	424
Windy Bay Shallow	2797	DBSS	7/9/97	-	3.5	1	15	9.57	9.74	6.94	37.4	0.02	84.7	-	422
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	10	1.6	10.61	19.64	7.58	39.1	0.03	108.7	-	437
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	9	3	10.74	19.09	7.58	38.8	0.02	108.9	-	437
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	8	4.7	11.09	18.2	7.53	37.9	0.02	110.4	-	439
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	7	6.1	11.2	17.22	7.43	37.5	0.02	109.3	-	442
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	6	7.6	11.19	16.86	7.34	37.3	0.02	108.3	-	444
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	5	9	11.06	16.59	7.26	37.2	0.02	106.5	-	445
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	4	10.5	10.86	15.92	7.17	36.6	0.02	103.1	-	447
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	3	12	10.67	15.4	7.05	36.6	0.02	100	-	449
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	2	13.5	9.73	14.29	6.93	36.9	0.02	89.2	-	453
Windy Bay Shallow	2997	SSJD	7/23/97	-	4.5	1	15.5	9.38	11.93	6.87	36.7	0.02	81.7	-	455

Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	12	0.4	8.97	24.09	7.47	42.1	0.03	105.3	-	369
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	11	1	8.97	24.06	7.47	42	0.03	105.3	-	370
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	10	2.5	9.06	23.78	7.42	42.1	0.03	105.8	-	372
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	9	4	9.06	23.38	7.4	42	0.03	105	-	373
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	8	5.5	9.39	22.43	7.35	41.3	0.03	106.8	-	374
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	7	7	9.93	20.42	7.23	39.5	0.03	108.6	-	378
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	6	8.5	10	17.76	7.11	36.1	0.02	103.5	-	383
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	5	10	9.48	14.74	6.98	34.9	0.02	92.2	-	389
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	4	11.5	9.06	12.82	6.95	34.6	0.02	84.5	-	392
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	3	13	8.88	10.21	6.94	35.4	0.02	78	-	394
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	2	14.5	8.99	9.33	6.97	36.2	0.02	77.3	-	394
Windy Bay Shallow	3197	DBSS	8/5/97	-	6.8	1	16	8.8	8.9	7.01	37.6	0.02	75.1	-	394
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	14	0.2	8.65	22.04	7.52	41.5	0.03	98.3	-	378
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	13	1.6	8.65	22.01	7.41	41.5	0.03	98.3	-	381
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	12	2.6	8.64	22.02	7.4	41.6	0.03	98.2	-	381
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	11	3.6	8.64	21.99	7.32	41.6	0.03	98.2	-	384
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	10	4.6	8.64	21.92	7.26	41.6	0.03	98	-	386
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	9	5.5	8.64	21.78	7.19	41.5	0.03	97.7	-	388
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	8	6.6	8.6	21.32	7.05	41.6	0.03	96.4	-	394
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	7	7.6	8.99	16.09	7.02	35.7	0.02	90.6	-	398
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	6	8.5	8.96	15.22	7.01	35.6	0.02	88.8	-	399
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	5	9.6	8.77	14.04	7.01	35.3	0.02	84.7	-	400
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	4	10.5	8.59	12.81	7.03	35	0.02	80.6	-	400
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	3	11.5	8.43	12.08	7.07	35.2	0.02	77.9	-	399
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	2	12.6	8.19	11.67	7.14	35.7	0.02	74.9	-	396
Windy Bay Shallow	3297	DBSS	8/14/97	-	4.5	1	13.7	8.03	10.82	7.13	36.3	0.02	72	-	398
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	12	0.4	9.26	20.74	7.51	46.5	0.03	102.8	-	368
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	11	1	9.27	20.76	7.5	46.4	0.03	102.9	-	368
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	10	2.5	9.26	20.74	7.48	46.5	0.03	102.8	-	369
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	9	3.9	9.27	20.74	7.45	46.4	0.03	102.8	-	370
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	8	5.5	9.23	20.7	7.38	46.6	0.03	102.4	-	372
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	7	7.1	9.21	20.65	7.27	46.8	0.03	102	-	377
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	6	8.6	9.02	17.29	6.94	39.9	0.03	93.4	-	389
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	5	10	9.19	14.11	6.9	38.6	0.02	88.9	-	392
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	4	11.5	8.86	12.31	6.86	38.7	0.02	82.3	-	395
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	3	13.1	8.52	10.95	6.86	39.6	0.03	76.7	-	396
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	2	14.4	8.44	9.36	6.9	41.3	0.03	73.2	-	396
Windy Bay Shallow	3497	DBSS	8/27/97	-	8	1	16.1	8.59	8.64	7.06	42.5	0.03	73.2	-	392
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	16	0.2	9.32	17.01	7.27	47.5	0.03	97.5	-	384
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	15	1.7	9.32	17.01	7.26	47.6	0.03	97.5	-	385

Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	14	2.7	9.32	17	7.24	47.6	0.03	97.5	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	13	3.7	9.3	17.01	7.24	47.5	0.03	97.3	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	12	4.7	9.3	16.98	7.23	47.6	0.03	97.2	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	11	5.7	9.31	16.96	7.22	47.6	0.03	97.2	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	10	6.7	9.29	16.91	7.19	47.3	0.03	97	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	9	7.7	9.28	16.81	7.18	47.2	0.03	96.8	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	8	8.7	9.29	16.75	7.15	47.1	0.03	96.8	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	7	9.7	9.31	16.58	7.13	46.5	0.03	96.5	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	6	10.7	9.33	16.52	7.1	46.3	0.03	96.6	-	385
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	5	11.7	9.31	16.48	7.07	46.1	0.03	96.3	-	386
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	4	12.7	9.3	16.38	7.05	45.9	0.03	96	-	386
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	3	13.7	9.24	16.04	7	45.6	0.03	94.7	-	387
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	2	14.7	9.23	15.25	6.96	43.7	0.03	93	-	388
Windy Bay Shallow	3797	ASRP	9/17/97	-	8.1	1	15.7	9.13	15.04	6.94	43.9	0.03	91.8	-	388
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	11	0.3	9.65	14.71	7.17	46.5	0.03	96.1	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	10	2	9.62	14.67	7.18	46.6	0.03	95.7	-	447
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	9	3.5	9.61	14.64	7.17	46.6	0.03	95.5	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	8	5	9.59	14.61	7.17	46.6	0.03	95.3	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	7	6.5	9.55	14.54	7.16	46.9	0.03	94.8	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	6	8	9.54	14.52	7.15	46.9	0.03	94.7	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	5	9.5	9.5	14.44	7.15	46.5	0.03	94	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	4	11	9.52	14.41	7.15	46.9	0.03	94.2	-	448
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	3	12.5	9.47	14.27	7.15	46.6	0.03	93.7	-	447
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	2	14	9.52	14.24	7.15	46.9	0.03	93.8	-	447
Windy Bay Shallow	3997	ASRA	9/29/97	-	7.5	1	15.2	9.48	14.16	7.15	46.8	0.03	93.2	-	447
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	16	0.3	10.06	12.32	7.24	49.9	0.03	93	-	387
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	15	1	10.07	12.33	7.25	49.8	0.03	93.1	-	387
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	14	2	10.05	12.33	7.25	49.8	0.03	93	-	387
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	13	3	10.05	12.33	7.24	49.9	0.03	93	-	388
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	12	4	10.06	12.32	7.24	49.9	0.03	93	-	387
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	11	5	10.05	12.33	7.23	50	0.03	93	-	387
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	10	6	10.05	12.33	7.21	49.9	0.03	93	-	388
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	9	7	10.05	12.33	7.2	49.9	0.03	93	-	388
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	8	8	10.04	12.33	7.19	49.8	0.03	93	-	389
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	7	9	10.06	12.32	7.18	49.9	0.03	93	-	389
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	6	10	10.07	12.32	7.15	49.9	0.03	93.1	-	390
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	5	11	10.07	12.33	7.16	49.9	0.03	93.1	-	389
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	4	12	10.08	12.32	7.13	49.9	0.03	93.2	-	390
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	3	13	10.09	12.33	7.12	49.9	0.03	93.3	-	391
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	2	14	10.1	12.32	7.1	49.9	0.03	93.3	-	391
Windy Bay Shallow	4297	DBAS	10/21/97	-	6.5	1	15	10.11	12.3	7.06	50	0.03	93.5	-	392

Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	11	0.4	10.55	10.17	7.05	47.6	0.03	93	57	409
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	10	1.7	10.53	9.89	7.14	47.7	0.03	92.2	105	406
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	9	3.2	10.53	9.78	7.1	48.2	0.03	91.9	144	408
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	8	4.7	10.53	9.74	7.12	48.6	0.03	91.8	117	407
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	7	6.2	10.51	9.66	7.14	49.1	0.03	91.5	141	406
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	6	7.7	10.52	9.55	7.1	49.7	0.03	91.4	134	408
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	5	9.2	10.55	9.51	7.12	49.8	0.03	91.5	100	407
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	4	10.7	10.56	9.46	7.09	50	0.03	91.5	138	408
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	3	12.2	10.49	9.42	7.09	50.2	0.03	90.8	152	408
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	2	13.7	10.53	9.33	7.08	50.2	0.03	90.9	115	409
Windy Bay Shallow	4497	DBAS	11/4/97	-	5.8	1	15.2	10.46	9.33	7.09	50.3	0.03	90.3	601	409

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	27	0.4	12.89	5.6	7.38	43.4	0.03	*****	-	385
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	26	1	12.89	5.6	7.36	43.5	0.03	*****	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	25	2	12.95	5.57	7.37	43.4	0.03	*****	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	24	3.2	12.96	5.54	7.37	43.5	0.03	*****	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	23	4.2	12.77	5.54	7.36	43.5	0.03	*****	-	386
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	22	5.5	12.88	5.51	7.35	43.6	0.03	*****	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	21	6.7	12.83	5.5	7.35	43.5	0.03	*****		387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	20	7.8	12.98	5.39	7.34	43.6	0.03	*****	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	19	9	12.7	5.34	7.33	43.5	0.03	*****	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	18	10.1	12.87	5.32	7.33	43.5	0.03	*****	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	17	11.4	12.92	5.3	7.33	43.5	0.03	*****	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	16	12.8	12.72	5.24	7.33	43.5	0.03	*****	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	15	14	12.75	5.22	7.32	43.4	0.03	*****	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	14	15.3	12.86	5.17	7.32	43.3	0.03	*****	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	13	16.5	12.62	5.12	7.32	43.2	0.03	99	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	12	17.8	12.61	5.09	7.31	43.2	0.03	99	-	389
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	11	19	12.59	5.04	7.31	43.2	0.03	98.7	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	10	20.2	12.63	5.06	7.31	43.2	0.03	99	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	9	21.5	12.77	4.99	7.31	43.2	0.03	99.9	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	8	22.7	12.77	4.96	7.3	43.3	0.03	99.9	-	389
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	7	24	12.84	4.74	7.31	43.9	0.03	99.9	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	6	25.3	12.7	4.73	7.3	43.9	0.03	98.8	-	389
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	5	26.5	12.79	4.74	7.3	43.9	0.03	99.5	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	4	27.9	12.85	4.74	7.31	43.9	0.03	99.7	-	387
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	3	29.1	12.85	4.71	7.3	43.9	0.03	99.8	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	2	30.5	12.71	4.71	7.3	44	0.03	98.8	-	388
Windy Bay Deep	1597	ASSS	4/18/97	-	1.6	1	31.8	12.93	4.74	7.31	43.9	0.03	*****	-	387
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	19	0.2	11.55	12.53	7.06	36.7	0.02	107.6	-	413

Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	18	1.8	11.42	10.91	7.05	34.6	0.02	102.4	-	417
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	17	3.8	11.3	9.97	7.01	34.4	0.02	99.2	-	419
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	16	5.8	11.31	9.48	7	35	0.02	98.2	-	419
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	15	7.8	11.3	9.09	6.98	35.3	0.02	97.2	-	420
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	14	9.8	11.44	8.3	6.98	37.5	0.02	96.5	-	420
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	13	11.8	11.49	7.66	6.97	39.6	0.03	95.4		421
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	12	13.8	11.53	7.27	6.96	40.2	0.03	94.8	-	421
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	11	15.8	11.54	7.12	6.96	40.6	0.03	94.6	-	421
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	10	17.8	11.55	7.07	6.96	40.9	0.03	94.5	-	420
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	9	19.8	11.63	6.79	6.95	42.7	0.03	94.5	-	420
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	8	21.8	11.65	6.66	6.95	43.3	0.03	94.4	-	420
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	7	23.8	11.74	6.33	6.94	45.1	0.03	94.3	-	419
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	6	25.8	11.71	6.33	6.94	45.3	0.03	94.1	-	419
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	5	27.8	11.72	6.25	6.93	45.8	0.03	93.8	-	419
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	4	29.8	11.63	6.17	6.92	46	0.03	93	-	418
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	3	31.8	11.6	5.89	6.9	47	0.03	92.1	-	418
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	2	33.8	11.57	5.75	6.91	47.2	0.03	91.6	-	421
Windy Bay Deep	1997	DBSS	5/16/97	-	1.9	1	35.8	11.52	5.75	6.91	47.5	0.03	91.1	-	425
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	19	0.2	10.79	15.64	7.04	31.2	0.02	107.9	-	385
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	18	1	10.79	15.59	7.01	31.3	0.02	107.8	-	386
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	17	3	10.89	14.01	6.95	31.2	0.02	105.1	-	390
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	16	5	10.49	11.31	6.9	30.6	0.02	95.3	-	394
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	15	7	10.51	10.33	6.92	29.1	0.02	93.3	-	393
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	14	9	10.6	9.99	6.92	28.2	0.02	93.3	-	392
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	13	11.1	10.72	9.42	6.92	29.4	0.02	93.1		393
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	12	12.9	10.8	8.99	6.93	29.1	0.02	92.7	-	393
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	11	14.9	10.88	8.48	6.92	31.1	0.02	92.3	-	393
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	10	17	11.03	7.91	6.91	34.3	0.02	92.3	-	394
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	9	19	11.14	7.33	6.89	37.4	0.02	91.9	-	395
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	8	21	11.05	7.1	6.88	38.4	0.02	90.7	-	395
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	7	23	11.13	6.61	6.87	40.4	0.03	90.2	-	396
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	6	24.9	11.12	6.33	6.86	41.5	0.03	89.5	-	396
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	5	27.1	11.03	6.08	6.85	42.5	0.03	88.2	-	397
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	4	28.9	11.03	5.97	6.85	42.8	0.03	87.9	-	397
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	3	30.9	10.89	5.87	6.84	43.3	0.03	86.6	-	398
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	2	33.1	10.89	5.84	6.85	43.4	0.03	86.4	-	398
Windy Bay Deep	2197	DBSS	5/29/97	-	1.5	1	35	10.81	5.9	6.85	43.4	0.03	86.1	-	398
Windy Bay Deep	2397	DBAS	6/11/97	-	2	17	0.8	10.58	14.84	6.97	37	0.02	104.4	-	422
Windy Bay Deep	2397	DBAS	6/11/97	-	2	16	2.8	10.68	13.55	6.94	35.7	0.02	102.6	-	424
Windy Bay Deep	2397	DBAS	6/11/97	-	2	15	4.8	10.67	10.86	6.95	31.8	0.02	96.2	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	14	6.9	10.7	10.12	6.95	30.1	0.02	94.8	-	424
Windy Bay Deep	2397	DBAS	6/11/97	-	2	13	8.8	10.61	9.91	6.94	30.1	0.02	93.5	-	425

Windy Bay Deep	2397	DBAS	6/11/97	-	2	12	10.8	10.67	9.2	6.94	31.8	0.02	92.5	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	11	12.8	10.66	9.02	6.93	33.2	0.02	92	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	10	14.8	10.67	8.84	6.93	33.9	0.02	91.7	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	9	16.7	10.67	8.58	6.92	35.2	0.02	91.2	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	8	18.9	10.75	7.86	6.91	38.3	0.02	90.3	-	426
Windy Bay Deep	2397	DBAS	6/11/97	-	2	7	20.7	10.81	6.91	6.89	42.8	0.03	88.6	-	427
Windy Bay Deep	2397	DBAS	6/11/97	-	2	6	22.6	10.81	6.76	6.89	43.7	0.03	88.2	-	427
Windy Bay Deep	2397	DBAS	6/11/97	-	2	5	24.8	10.82	6.61	6.89	44.3	0.03	88	-	426
Windy Bay Deep	2397	DBAS	6/11/97	-	2	4	26.8	10.85	6.51	6.88	44.7	0.03	88	-	426
Windy Bay Deep	2397	DBAS	6/11/97	-	2	3	28.7	10.92	6.33	6.88	45.4	0.03	88.2	-	426
Windy Bay Deep	2397	DBAS	6/11/97	-	2	2	30.5	10.76	6.18	6.88	46.2	0.03	86.4	-	425
Windy Bay Deep	2397	DBAS	6/11/97	-	2	1	32.4	10.85	5.98	6.87	47.1	0.03	86.7	-	426
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	16	0.3	10.75	13.52	7.13	35	0.02	102.9	-	435
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	15	1.2	10.74	13.52	7.12	35	0.02	102.8	-	436
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	14	3.3	10.76	13.44	7.08	34.9	0.02	102.8	-	437
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	13	5.3	10.79	12.84	7.05	34.5	0.02	101.6	-	438
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	12	7.4	10.78	12.14	7.05	33.5	0.02	100	-	438
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	11	9.4	10.7	11.99	7.02	33.2	0.02	99	-	437
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	10	11.4	10.74	11.92	7	33.1	0.02	99.2	-	437
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	9	13.4	10.77	11.27	6.98	33.1	0.02	98	-	437
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	8	15.3	10.75	10.79	6.96	33	0.02	96.7	-	438
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	7	17.4	10.64	9.37	6.92	34.9	0.02	92.5	-	439
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	6	19.4	10.66	7.47	6.9	39.3	0.03	88.5	-	441
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	5	21.2	10.65	7.27	6.9	40.2	0.03	87.9	-	440
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	4	23.3	10.67	6.73	6.9	42.3	0.03	87	-	440
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	3	25.3	10.71	6.56	6.9	43	0.03	86.8	-	439
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	2	27.3	10.62	6.23	6.91	44.4	0.03	85.5	-	438
Windy Bay Deep	2597	DBSS	6/26/97	-	2.8	1	29.2	10.67	6.25	6.93	44.4	0.03	85.9	-	437
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	16	0.3	10.09	17.22	7.16	38.2	0.02	*****	-	421
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	15	1	10.11	17.17	7.15	38.1	0.02	*****	-	421
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	14	3	10.19	16.89	7.06	37.9	0.02	*****	-	425
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	13	5	10.35	15.28	7.04	36.2	0.02	*****	-	426
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	12	7	10.26	14.31	6.98	35.7	0.02	*****	-	428
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	11	9	10.18	13.32	6.93	35.2	0.02	97.9	-	429
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	10	11	9.93	12.73	6.86	34.4	0.02	94.3	-	431
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	9	13	9.88	11.56	6.83	34.5	0.02	91.5	-	433
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	8	15	9.83	9.32	6.78	37.1	0.02	86.2	-	435
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	7	17	10.07	7.65	6.79	40.5	0.03	84.7	-	436
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	6	18.9	10.12	7.43	6.78	41	0.03	84.7	-	436
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	5	20.9	10.3	7.1	6.79	41.4	0.03	85.5	-	436
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	4	23	10.31	6.79	6.79	42.7	0.03	84.8	-	436
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	3	25	10.32	6.69	6.79	43.1	0.03	84.8	-	436

Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	2	27	10.34	6.4	6.78	44.4	0.03	84.3	-	436
Windy Bay Deep	2797	DBSS	7/9/97	-	4.1	1	29.1	10.13	6.13	6.78	45.6	0.03	82.1	-	436
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	15	0.4	9.68	20.43	7.4	38.9	0.02	*****	-	417
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	14	1.5	9.88	19.74	7.38	38	0.02	*****	-	418
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	13	5.6	10.3	17.73	7.24	35.3	0.02	*****	-	423
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	12	7.6	10.39	16.87	7.14	35.4	0.02	*****	-	426
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	11	9.6	10.36	16.08	6.99	35.3	0.02	*****	-	431
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	10	11.6	9.99	14.64	6.85	34.2	0.02	97.7	-	437
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	9	13.6	9.49	13.24	6.75	33.4	0.02	90	-	441
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	8	15.6	8.99	10.54	6.69	34	0.02	80.2	-	444
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	7	17.6	9.71	8.29	6.67	37	0.02	82	-	446
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	6	19.6	9.92	7.28	6.67	39.2	0.03	81.7	-	446
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	5	21.6	9.99	6.87	6.66	40.4	0.03	81.4	-	447
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	4	23.6	10.1	6.66	6.66	41.1	0.03	81.8	-	447
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	3	25.5	10.09	6.51	6.66	41.5	0.03	81.5	-	446
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	2	27.7	10.07	6.31	6.66	42.2	0.03	81	-	446
Windy Bay Deep	2997	SSJD	7/24/97	-	6.5	1	29.6	9.6	6.33	6.65	42.7	0.03	77.2	-	447
Windy Bay Deep	3197	DBSS	8/5/97	-	8	18	0.3	8.91	24.3	7.42	42.5	0.03	105	-	371
Windy Bay Deep	3197	DBSS	8/5/97	-	8	17	2.3	9.05	23.52	7.4	43.6	0.03	105.1	-	372
Windy Bay Deep	3197	DBSS	8/5/97	-	8	16	4.2	9.24	22.92	7.31	43	0.03	106.1	-	375
Windy Bay Deep	3197	DBSS	8/5/97	-	8	15	6.3	9.79	20.85	7.2	40	0.03	108.1	-	378
Windy Bay Deep	3197	DBSS	8/5/97	-	8	14	8.3	10.19	16.78	7.03	35.7	0.02	103.5	-	385
Windy Bay Deep	3197	DBSS	8/5/97	-	8	13	10.4	9.31	13.48	6.87	34.2	0.02	88	-	392
Windy Bay Deep	3197	DBSS	8/5/97	-	8	12	12.3	8.86	11.15	6.84	34.7	0.02	79.6	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	11	14.2	8.98	9.66	6.85	35.4	0.02	77.8	-	395
Windy Bay Deep	3197	DBSS	8/5/97	-	8	10	16.2	9.21	8.37	6.85	37.6	0.02	77.4	-	395
Windy Bay Deep	3197	DBSS	8/5/97	-	8	9	18.3	9.66	7.5	6.87	38.7	0.02	79.5	-	395
Windy Bay Deep	3197	DBSS	8/5/97	-	8	8	20.3	9.78	7.05	6.87	40.3	0.03	79.5	-	395
Windy Bay Deep	3197	DBSS	8/5/97	-	8	7	22.3	9.96	6.79	6.89	40.8	0.03	80.4	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	6	24.2	10.08	6.57	6.89	41.3	0.03	81	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	5	26.3	10.1	6.38	6.91	42	0.03	80.7	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	4	28.3	10	6.23	6.92	42.7	0.03	79.7	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	3	30.3	9.74	6.26	6.93	43.2	0.03	77.7	-	394
Windy Bay Deep	3197	DBSS	8/5/97	-	8	2	32.3	9.57	6.21	6.94	43.2	0.03	76.2	-	393
Windy Bay Deep	3197	DBSS	8/5/97	-	8	1	34.3	9.56	6.18	6.98	44.8	0.03	76.1	-	392
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	16	0.3	8.72	22.94	7.3	41.9	0.03	100.8	-	382
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	15	1.3	8.77	22.33	7.2	42.6	0.03	100.2	-	388
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	14	3.3	8.8	22.03	7.13	43.1	0.03	100.1	-	391
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	13	5.3	8.9	21.82	7.43	42	0.03	100.7	-	384
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	12	7.3	8.87	21.61	7.31	41.5	0.03	100	-	388
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	11	9.3	8.96	20.73	7.4	41.3	0.03	99.4	-	383

Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	10	11.3	8.86	13.82	6.78	35.3	0.02	85.6	-	408
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	9	13.5	8.82	11.59	7.2	35.9	0.02	80.5	-	399
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	8	15.4	8.47	10.68	6.75	35.9	0.02	75.7	-	411
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	7	17.4	8.57	9.04	6.76	37.3	0.02	73.7	-	411
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	6	19.3	8.84	8.18	6.77	39	0.03	74.4	-	411
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	5	21.4	9.11	7.27	6.78	40.8	0.03	74.9	-	411
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	4	23.4	9.37	6.92	6.8	41.5	0.03	76.6	-	410
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	3	25.4	9.5	6.72	6.81	42.1	0.03	77.1	-	409
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	2	27.4	9.52	6.56	6.82	42.5	0.03	76.9	-	408
Windy Bay Deep	3297	DBSS	8/13/97	-	10.5	1	29.4	9.12	6.33	6.83	43.8	0.03	73.3	-	408
Windy Bay Deep	3497	DBSS	8/27/97	-	8	16	0.3	9.22	20.87	7.41	47	0.03	102.6	-	372
Windy Bay Deep	3497	DBSS	8/27/97	-	8	15	1.5	9.23	20.83	7.39	47.1	0.03	102.7	-	372
Windy Bay Deep	3497	DBSS	8/27/97	-	8	14	3.5	9.23	20.78	7.33	46.9	0.03	102.5	-	374
Windy Bay Deep	3497	DBSS	8/27/97	-	8	13	5.4	9.24	20.67	7.26	46.8	0.03	102.4	-	375
Windy Bay Deep	3497	DBSS	8/27/97	-	8	12	7.5	9.15	20.69	7.08	46.7	0.03	101.5	-	382
Windy Bay Deep	3497	DBSS	8/27/97	-	8	11	9.5	9.28	15.93	6.87	38.8	0.02	93.5	-	394
Windy Bay Deep	3497	DBSS	8/27/97	-	8	10	11.5	8.91	12.38	6.82	38.3	0.02	82.9	-	397
Windy Bay Deep	3497	DBSS	8/27/97	-	8	9	13.6	8.48	9.58	6.8	40.6	0.03	73.9	-	399
Windy Bay Deep	3497	DBSS	8/27/97	-	8	8	15.5	9.07	7.68	6.8	43.2	0.03	75.5	-	401
Windy Bay Deep	3497	DBSS	8/27/97	-	8	7	17.2	9.43	7.07	6.83	44.3	0.03	77.4	-	400
Windy Bay Deep	3497	DBSS	8/27/97	-	8	6	21.6	9.72	6.64	6.88	45.3	0.03	78.8	-	399
Windy Bay Deep	3497	DBSS	8/27/97	-	8	5	23.5	9.72	6.5	6.89	45.6	0.03	78.6	-	398
Windy Bay Deep	3497	DBSS	8/27/97	-	8	4	25.6	9.71	6.38	6.9	46.1	0.03	78.2	-	398
Windy Bay Deep	3497	DBSS	8/27/97	-	8	3	27.5	9.58	6.3	6.92	46.4	0.03	77	-	398
Windy Bay Deep	3497	DBSS	8/27/97	-	8	2	29.5	9.47	6.28	6.96	46.5	0.03	76.2	-	397
Windy Bay Deep	3497	DBSS	8/27/97	-	8	1	31.7	9.48	6.28	7.05	46.7	0.03	76.2	-	395
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	17	0.4	9.28	17.53	7.3	52	0.03	98.1	-	389
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	16	2.7	9.34	17.56	7.27	52	0.03	98.6	-	390
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	15	4.7	9.22	17.51	7.22	52	0.03	97.5	-	392
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	14	6.7	9.22	17.24	7.18	50.2	0.03	96.9	-	393
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	13	8.7	9.25	17.17	7.15	49.7	0.03	97.1	-	393
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	12	10.7	9.28	17.12	7.08	48.7	0.03	97.3	-	395
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	11	12.7	9.26	16.8	6.98	47.3	0.03	96.3	-	398
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	10	14.7	9.07	15.91	6.86	45	0.03	92.6	-	403
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	9	16.7	8.66	12.17	6.73	40.1	0.03	81.4	-	411
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	8	18.7	8.43	10.51	6.7	41.1	0.03	76.3	-	412
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	7	20.7	8.47	9.46	6.71	41.9	0.03	74.8	-	412
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	6	22.7	8.57	8.43	6.71	42.7	0.03	73.8	-	413
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	5	24.7	8.89	7.38	6.72	43.9	0.03	74.6	-	413
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	4	26.7	9.04	7.07	6.74	44.5	0.03	75.3	-	412
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	3	28.7	9.16	6.73	6.76	45.2	0.03	75.6	-	411
Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	2	30.7	9.21	6.64	6.8	45.2	0.03	75.9	-	410

Windy Bay Deep	3797	ASRP	9/17/97	-	7.5	1	32.7	9.23	6.64	6.84	45.2	0.03	76	-	408
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	17	0.2	9.77	15.09	7.16	46.3	0.03	98.1	-	444
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	16	2	9.65	15.03	7.16	46.4	0.03	96.8	-	444
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	15	4	9.6	14.96	7.15	46.2	0.03	96.2	-	444
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	14	6	9.59	14.78	7.11	46.6	0.03	95.7	-	445
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	13	8	9.57	14.66	7.09	46.5	0.03	95.2	-	446
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	12	10	9.57	14.66	7.07	46.6	0.03	95.2	-	446
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	11	12	9.5	14.58	7.02	46.5	0.03	94.3	-	447
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	10	14	9.39	14.35	6.97	45.9	0.03	92.8	-	448
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	9	16	9.34	13.92	6.94	45.4	0.03	91.4	-	449
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	8	18	9.28	13.6	6.91	45	0.03	90.2	-	450
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	7	20	9.23	13.3	6.85	44.7	0.03	89.1	-	451
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	6	22	8.88	11.2	6.78	42.2	0.03	81.7	-	455
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	5	23.9	8.9	8.48	6.75	41.4	0.03	76.8	-	457
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	4	26	8.91	7.97	6.74	41.8	0.03	75.9	-	457
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	3	28	8.94	7.6	6.76	42	0.03	75.5	-	457
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	2	30	8.93	7.28	6.8	42.2	0.03	74.8	-	455
Windy Bay Deep	3997	ASRA	9/29/97	-	7.5	1	31.8	9.05	7	6.83	42.6	0.03	75.3	-	454
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	16	0.3	9.92	12.28	7.14	49.7	0.03	91.7	-	386
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	15	1	9.94	12.28	7.14	49.7	0.03	91.8	-	387
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	14	3	9.92	12.3	7.14	49.7	0.03	91.6	-	386
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	13	5	9.91	12.3	7.12	49.7	0.03	91.5	-	387
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	12	7	9.91	12.28	7.1	49.9	0.03	91.6	-	387
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	11	9	9.92	12.27	7.07	49.8	0.03	91.6	-	388
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	10	11	9.91	12.27	7.03	49.7	0.03	91.5	-	388
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	9	13	9.88	12.27	6.99	49.7	0.03	91.2	-	389
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	8	15	9.82	12.27	6.91	49.8	0.03	90.7	-	392
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	7	17	9.74	12.18	6.8	49.8	0.03	89.7	-	395
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	6	19	8.21	10.1	6.64	48.8	0.03	72.1	-	401
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	5	21	8.3	7.99	6.64	47.5	0.03	69.2	-	402
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	4	23	8.4	7.35	6.64	47.5	0.03	69	-	402
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	3	25	8.27	6.96	6.65	47.6	0.03	67.3	-	402
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	2	27	8.28	6.91	6.65	47.9	0.03	67.2	-	402
Windy Bay Deep	4297	DBAS	10/21/97	-	7.3	1	29.1	8.27	6.84	6.71	47.9	0.03	67	-	401
Windy Bay Deep	4497	DBAS	11/4/97	-	7	16	0.6	10.6	10.33	7.11	46.8	0.03	93.7	57	411
Windy Bay Deep	4497	DBAS	11/4/97	-	7	15	2.8	10.56	10.23	7.1	46.9	0.03	93.1	142	413
Windy Bay Deep	4497	DBAS	11/4/97	-	7	14	4.8	10.5	10.22	7.11	46.9	0.03	92.6	207	413
Windy Bay Deep	4497	DBAS	11/4/97	-	7	13	6.8	10.43	10.07	7.09	47.1	0.03	91.6	56	414
Windy Bay Deep	4497	DBAS	11/4/97	-	7	12	8.8	10.46	10.07	7.08	47.1	0.03	91.9	46	415
Windy Bay Deep	4497	DBAS	11/4/97	-	7	11	10.8	10.45	10.09	7.09	47.2	0.03	91.9	40	415
Windy Bay Deep	4497	DBAS	11/4/97	-	7	10	12.8	10.46	10.07	7.09	47.2	0.03	91.9	117	415

Windy Bay Deep	4497	DBAS	11/4/97	-	7	9	14.8	10.47	10.05	7.09	47.2	0.03	92	159	415
Windy Bay Deep	4497	DBAS	11/4/97	-	7	8	16.8	10.42	10.04	7.08	47.4	0.03	91.5	132	415
Windy Bay Deep	4497	DBAS	11/4/97	-	7	7	18.8	10.44	10.04	7.08	47.3	0.03	91.7	102	415
Windy Bay Deep	4497	DBAS	11/4/97	-	7	6	20.8	10.45	10.02	7.07	47.3	0.03	91.7	112	416
Windy Bay Deep	4497	DBAS	11/4/97	-	7	5	22.8	10.43	9.97	7.07	47.5	0.03	91.5	52	416
Windy Bay Deep	4497	DBAS	11/4/97	-	7	4	24.8	10.39	9.91	7.04	47.7	0.03	91	55	417
Windy Bay Deep	4497	DBAS	11/4/97	-	7	3	26.8	10.34	9.71	7.03	48.3	0.03	90.1	119	418
Windy Bay Deep	4497	DBAS	11/4/97	-	7	2	28.8	10.24	9.33	7.02	49.5	0.03	88.5	111	419
Windy Bay Deep	4497	DBAS	11/4/97	-	7	1	30.8	10.05	9.02	7.01	50	0.03	86.1	631	421

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
CDA River	1597	ASSS	4/18/97	-	1.8	17	0.4	12.48	6.49	7.48	37.4	0.02	*****	-	372
CDA River	1597	ASSS	4/18/97	-	1.8	16	1.4	12.52	6.33	7.46	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	15	2.4	12.46	6.3	7.46	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	14	3.5	12.47	6.28	7.45	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	13	4.6	12.42	6.28	7.44	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	12	5.5	12.4	6.28	7.44	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	11	6.6	12.41	6.26	7.43	37.5	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	10	7.8	12.39	6.25	7.43	37.4	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	9	8.8	12.45	6.23	7.42	37.5	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	8	10	12.42	6.2	7.42	37.5	0.02	*****	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	7	11.1	12.38	6.17	7.42	37.6	0.02	99.9	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	6	12.4	12.34	6.08	7.41	38	0.02	99.3	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	5	13.5	12.32	5.88	7.41	38.4	0.02	98.6	-	374
CDA River	1597	ASSS	4/18/97	-	1.8	4	14.8	12.27	5.77	7.4	38.5	0.02	98	-	375
CDA River	1597	ASSS	4/18/97	-	1.8	3	16	12.23	5.67	7.39	38.4	0.02	97.4	-	376
CDA River	1597	ASSS	4/18/97	-	1.8	2	17.2	12.19	5.59	7.39	38.3	0.02	96.9	-	380
CDA River	1597	ASSS	4/18/97	-	1.8	1	18.6	12.59	5.44	7.38	38.4	0.02	99.9	-	382
CDA River	1997	DBSS	5/16/97	-	0.6	15	0.2	10.61	14.93	6.94	32	0.02	104.3	-	390
CDA River	1997	DBSS	5/16/97	-	0.6	14	1.6	10.56	12.51	6.86	32	0.02	98.3	-	399
CDA River	1997	DBSS	5/16/97	-	0.6	13	2.7	10.43	12.37	6.84	32.1	0.02	96.8	-	401
CDA River	1997	DBSS	5/16/97	-	0.6	12	3.7	10.41	12.27	6.83	32.3	0.02	96.4	-	402
CDA River	1997	DBSS	5/16/97	-	0.6	11	4.7	10.33	12.18	6.82	32.2	0.02	95.5	-	402
CDA River	1997	DBSS	5/16/97	-	0.6	10	5.7	10.25	11.91	6.82	32.4	0.02	94.1	-	404
CDA River	1997	DBSS	5/16/97	-	0.6	9	6.7	10.25	11.76	6.82	32.3	0.02	93.8	-	404
CDA River	1997	DBSS	5/16/97	-	0.6	8	7.7	10.24	11.64	6.85	32.3	0.02	93.5	-	403
CDA River	1997	DBSS	5/16/97	-	0.6	7	8.7	10.33	11.31	6.93	32	0.02	93.7	-	400
CDA River	1997	DBSS	5/16/97	-	0.6	6	9.7	10.67	10.4	6.99	31	0.02	94.6	-	396
CDA River	1997	DBSS	5/16/97	-	0.6	5	10.7	11.02	9.42	7.01	29.6	0.02	95.5	-	394
CDA River	1997	DBSS	5/16/97	-	0.6	4	11.7	11	9.06	7.01	31.9	0.02	94.5	-	394
CDA River	1997	DBSS	5/16/97	-	0.6	3	12.7	10.99	8.88	7.01	32.5	0.02	94	-	393

CDA River	1997	DBSS	5/16/97	-	0.6	2	13.7	11.02	8.77	7.01	32.9	0.02	94	-	392
CDA River	1997	DBSS	5/16/97	-	0.6	1	14.7	10.97	8.73	7.01	33	0.02	93.5	-	395
CDA River	2197	DBSS	5/29/97	-	1.7	12	0.5	10.55	14.36	6.93	35.9	0.02	102.5	-	389
CDA River	2197	DBSS	5/29/97	-	1.7	11	1.4	10.7	13.83	6.95	35.4	0.02	102.8	-	389
CDA River	2197	DBSS	5/29/97	-	1.7	10	2.3	10.71	13.67	6.94	34.6	0.02	102.5	-	390
CDA River	2197	DBSS	5/29/97	-	1.7	9	3.5	10.8	12.2	6.92	35.6	0.02	100.1	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	8	4.3	10.8	12.05	6.91	35.7	0.02	99.8	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	7	5.4	10.8	12	6.91	35.8	0.02	99.6	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	6	6.3	10.78	11.94	6.91	35.8	0.02	99.3	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	5	7.3	10.77	11.92	6.91	35.8	0.02	99.2	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	4	8.3	10.65	11.2	6.94	33.3	0.02	96.4	-	392
CDA River	2197	DBSS	5/29/97	-	1.7	3	9.3	10.87	9.58	7.01	27.5	0.02	94.7	-	389
CDA River	2197	DBSS	5/29/97	-	1.7	2	10.3	10.87	9.33	7.02	26.8	0.02	94.2	-	390
CDA River	2197	DBSS	5/29/97	-	1.7	1	11.4	10.86	9.33	7.01	27.1	0.02	94.1	-	392
CDA River	2397	DBAS	6/11/97	-	1.9	13	0.4	10.07	16.99	6.99	43.2	0.03	104	-	420
CDA River	2397	DBAS	6/11/97	-	1.9	12	1	10.06	15.56	7	44.3	0.03	100.8	-	420
CDA River	2397	DBAS	6/11/97	-	1.9	11	2	10.06	15.31	6.98	44.8	0.03	100.3	-	421
CDA River	2397	DBAS	6/11/97	-	1.9	10	2.9	10	14.53	6.97	45	0.03	98	-	422
CDA River	2397	DBAS	6/11/97	-	1.9	9	4	10.02	14.59	6.98	45.1	0.03	98.3	-	421
CDA River	2397	DBAS	6/11/97	-	1.9	8	5	10.06	14.36	6.99	44.7	0.03	98.2	-	421
CDA River	2397	DBAS	6/11/97	-	1.9	7	5.9	10.05	14.28	6.99	44	0.03	97.9	-	421
CDA River	2397	DBAS	6/11/97	-	1.9	6	6.9	10.52	12.6	7.03	36.9	0.02	98.7	-	419
CDA River	2397	DBAS	6/11/97	-	1.9	5	7.8	10.59	12.22	7.05	34.8	0.02	98.6	-	417
CDA River	2397	DBAS	6/11/97	-	1.9	4	8.9	10.94	11.51	7.08	30.8	0.02	100.1	-	415
CDA River	2397	DBAS	6/11/97	-	1.9	3	9.9	11.04	11.3	7.08	30.1	0.02	100.5	-	414
CDA River	2397	DBAS	6/11/97	-	1.9	2	10.9	11.08	11.25	7.07	29.2	0.02	100.8	-	414
CDA River	2397	DBAS	6/11/97	-	1.9	1	11.9	10.86	10.87	7.07	29.1	0.02	98.1	-	414
CDA River	2597	DBSS	6/26/97	-	2.2	13	0.3	10.46	14.23	7.08	45.3	0.03	101.7	-	435
CDA River	2597	DBSS	6/26/97	-	2.2	12	1.2	10.46	14.25	7.07	45.3	0.03	101.7	-	437
CDA River	2597	DBSS	6/26/97	-	2.2	11	2.3	10.45	14.16	7.05	45	0.03	101.5	-	438
CDA River	2597	DBSS	6/26/97	-	2.2	10	3.3	10.49	13.73	7.01	44.6	0.03	100.7	-	439
CDA River	2597	DBSS	6/26/97	-	2.2	9	4.2	10.47	13.6	7.03	42.4	0.03	100.4	-	437
CDA River	2597	DBSS	6/26/97	-	2.2	8	5.2	10.52	13.4	7.02	37.8	0.02	100.5	-	436
CDA River	2597	DBSS	6/26/97	-	2.2	7	6.2	10.56	12.5	7	34.2	0.02	98.8	-	436
CDA River	2597	DBSS	6/26/97	-	2.2	6	7.2	10.55	12.18	7	32.4	0.02	98	-	435
CDA River	2597	DBSS	6/26/97	-	2.2	5	8.3	10.45	11.41	7	30.5	0.02	95.3	-	435
CDA River	2597	DBSS	6/26/97	-	2.2	4	9	10.39	11.36	7	30.4	0.02	94.7	-	435
CDA River	2597	DBSS	6/26/97	-	2.2	3	10.2	10.39	11.33	6.99	30.4	0.02	94.7	-	434
CDA River	2597	DBSS	6/26/97	-	2.2	2	11.5	10.22	11.12	6.98	30.4	0.02	92.6	-	434
CDA River	2597	DBSS	6/26/97	-	2.2	1	12.6	10.07	10.82	7	30.6	0.02	90.6	-	433

CDA River	2797	DBSS	7/9/97	-	3.3	11	0.4	9.72	18.54	7.11	49.9	0.03	*****	-	421
CDA River	2797	DBSS	7/9/97	-	3.3	10	1.1	9.72	18.53	7.09	50	0.03	*****	-	421
CDA River	2797	DBSS	7/9/97	-	3.3	9	2.1	9.73	18.5	7.06	52.1	0.03	*****	-	422
CDA River	2797	DBSS	7/9/97	-	3.3	8	3	9.78	18.37	7	54.8	0.04	*****	-	424
CDA River	2797	DBSS	7/9/97	-	3.3	7	4.1	9.6	18.03	6.91	69.8	0.04	*****	-	428
CDA River	2797	DBSS	7/9/97	-	3.3	6	5	9.65	17.73	6.86	75.4	0.05	*****	-	430
CDA River	2797	DBSS	7/9/97	-	3.3	5	6	9.96	14.99	-	43	0.03	99.4	-	426
CDA River	2797	DBSS	7/9/97	-	3.3	4	7	10	13.1	6.94	34.1	0.02	95.7	-	425
CDA River	2797	DBSS	7/9/97	-	3.3	3	9	9.76	11.94	6.91	33.4	0.02	90.9	-	426
CDA River	2797	DBSS	7/9/97	-	3.3	2	10.1	9.75	11.82	6.92	33.4	0.02	90.6	-	426
CDA River	2797	DBSS	7/9/97	-	3.3	1	11	9.71	11.82	6.94	33.4	0.02	90.3	-	430
CDA River	2997	SSJD	7/24/97	-	4.5	12	0.5	9.38	21.69	7.49	39.8	0.03	*****	-	395
CDA River	2997	SSJD	7/24/97	-	4.5	11	1.2	9.4	21.37	7.46	42.7	0.03	*****	-	396
CDA River	2997	SSJD	7/24/97	-	4.5	10	2.3	9.4	21.33	7.4	48.4	0.03	*****	-	398
CDA River	2997	SSJD	7/24/97	-	4.5	9	3.2	9.4	21.33	7.37	50.1	0.03	*****	-	398
CDA River	2997	SSJD	7/24/97	-	4.5	8	4.2	9.4	21.3	7.33	51.3	0.03	*****	-	398
CDA River	2997	SSJD	7/24/97	-	4.5	7	5.3	9.42	21.11	7.26	49.9	0.03	*****	-	398
CDA River	2997	SSJD	7/24/97	-	4.5	6	6.2	9.33	20.67	7.11	58.2	0.04	*****	-	402
CDA River	2997	SSJD	7/24/97	-	4.5	5	7.2	10.2	16.19	7.12	35.9	0.02	*****	-	401
CDA River	2997	SSJD	7/24/97	-	4.5	4	8.2	9.82	15.19	7.02	34.9	0.02	97.2	-	403
CDA River	2997	SSJD	7/24/97	-	4.5	3	9.2	9.45	14.18	6.98	34	0.02	91.5	-	402
CDA River	2997	SSJD	7/24/97	-	4.5	2	10.2	9.28	13.84	0	34	0.02	89.2	-	400
CDA River	2997	SSJD	7/24/97	-	4.5	1	11.2	8.84	13.68	7.01	34.2	0.02	84.7	-	397
CDA River	3197	DBSS	8/5/97	-	5.5	11	0.4	9.38	25.18	7.65	61.4	0.04	112.4	-	359
CDA River	3197	DBSS	8/5/97	-	5.5	10	1.1	9.29	24.06	7.58	53.3	0.03	109	-	361
CDA River	3197	DBSS	8/5/97	-	5.5	9	2.1	9.23	23.67	7.54	50.8	0.03	107.6	-	362
CDA River	3197	DBSS	8/5/97	-	5.5	8	3.2	9.1	23.53	7.5	46.6	0.03	105.8	-	363
CDA River	3197	DBSS	8/5/97	-	5.5	7	4.2	9.14	23.26	7.46	46.6	0.03	105.8	-	365
CDA River	3197	DBSS	8/5/97	-	5.5	6	5.2	9.22	23.15	7.39	49.1	0.03	106.3	-	366
CDA River	3197	DBSS	8/5/97	-	5.5	5	6	10.06	19.97	7.38	41.6	0.03	109.2	-	367
CDA River	3197	DBSS	8/5/97	-	5.5	4	7.1	9.71	19.4	7.31	42.1	0.03	0	-	369
CDA River	3197	DBSS	8/5/97	-	5.5	3	8	9.81	18.17	7.33	38.3	0.02	102.7	-	368
CDA River	3197	DBSS	8/5/97	-	5.5	2	8.9	10.49	17.23	7.35	36.1	0.02	107.7	-	366
CDA River	3197	DBSS	8/5/97	-	5.5	1	10	9.81	16.75	7.32	36.6	0.02	99.7	-	368
CDA River	3297	DBSS	8/13/97	-	6	10	0.2	8.82	23.38	7.74	54.8	0.04	102.8	-	363
CDA River	3297	DBSS	8/13/97	-	6	9	0.7	8.77	23.13	7.65	53.9	0.03	101.8	-	369
CDA River	3297	DBSS	8/13/97	-	6	8	1.7	8.74	22.74	7.66	47.7	0.03	100.7	-	368
CDA River	3297	DBSS	8/13/97	-	6	7	2.7	8.8	22.65	7.68	50.3	0.03	101.3	-	367
CDA River	3297	DBSS	8/13/97	-	6	6	3.7	8.88	22.63	7.66	52.9	0.03	102.2	-	367
CDA River	3297	DBSS	8/13/97	-	6	5	4.7	8.91	22.33	7.64	56	0.04	101.9	-	367
CDA River	3297	DBSS	8/13/97	-	6	4	5.6	8.95	22.24	7.58	61.9	0.04	102.2	-	368

CDA River	3297	DBSS	8/13/97	-	6	3	6.7	8.95	22.08	7.3	67.3	0.04	101.8	-	375
CDA River	3297	DBSS	8/13/97	-	6	2	7.7	8.67	19.88	7.15	46.5	0.03	94.5	-	381
CDA River	3297	DBSS	8/13/97	-	6	1	8.7	8.73	17.78	7.14	39.5	0.03	91.2	-	382
CDA River	3497	DBSS	8/27/97	-	6.1	13	0.3	9.13	20.86	7.53	52.7	0.03	101.5	-	346
CDA River	3497	DBSS	8/27/97	-	6.1	12	0.9	9.14	20.84	7.54	52.6	0.03	101.7	-	345
CDA River	3497	DBSS	8/27/97	-	6.1	11	2	9.14	20.84	7.54	52.5	0.03	101.7	-	344
CDA River	3497	DBSS	8/27/97	-	6.1	10	2.9	9.14	20.83	7.54	53.3	0.03	101.7	-	344
CDA River	3497	DBSS	8/27/97	-	6.1	9	4	9.14	20.81	7.52	55.2	0.04	101.6	-	345
CDA River	3497	DBSS	8/27/97	-	6.1	8	5.1	9.12	20.81	7.5	55.4	0.04	101.4	-	345
CDA River	3497	DBSS	8/27/97	-	6.1	7	6.1	9.11	20.77	7.48	58	0.04	101.2	-	346
CDA River	3497	DBSS	8/27/97	-	6.1	6	6.9	9.08	20.76	7.47	58.3	0.04	100.9	-	345
CDA River	3497	DBSS	8/27/97	-	6.1	5	7.9	9.09	20.72	7.44	60	0.04	100.9	-	346
CDA River	3497	DBSS	8/27/97	-	6.1	4	9	9.06	20.69	7.41	59.8	0.04	100.4	-	346
CDA River	3497	DBSS	8/27/97	-	6.1	3	10	9.03	20.67	7.39	59.1	0.04	100.2	-	345
CDA River	3497	DBSS	8/27/97	-	6.1	2	10.9	8.92	20.56	7.37	59	0.04	98.7	-	345
CDA River	3497	DBSS	8/27/97	-	6.1	1	12	8.08	16.69	7.11	42.1	0.03	82.6	-	359
CDA River	3797	ASRP	9/17/97	-	5.5	11	0.1	9.38	17.47	7.44	58.9	0.04	99.1	-	370
CDA River	3797	ASRP	9/17/97	-	5.5	10	1	9.32	17.49	7.43	58.9	0.04	98.4	-	369
CDA River	3797	ASRP	9/17/97	-	5.5	9	2	9.24	17.48	7.45	59.1	0.04	97.6	-	368
CDA River	3797	ASRP	9/17/97	-	5.5	8	3	9.35	17.49	7.42	59	0.04	98.8	-	369
CDA River	3797	ASRP	9/17/97	-	5.5	7	4	9.37	17.48	7.4	59.6	0.04	99	-	369
CDA River	3797	ASRP	9/17/97	-	5.5	6	5	9.35	17.49	7.39	59.3	0.04	98.8	-	369
CDA River	3797	ASRP	9/17/97	-	5.5	5	6	9.29	17.48	7.37	59.8	0.04	97.9	-	368
CDA River	3797	ASRP	9/17/97	-	5.5	4	7	9.28	17.43	7.34	61	0.04	97.8	-	368
CDA River	3797	ASRP	9/17/97	-	5.5	3	8	9.19	17.44	7.22	61	0.04	97	-	369
CDA River	3797	ASRP	9/17/97	-	5.5	2	9	8.59	9.82	7.04	50.3	0.03	76.9	-	380
CDA River	3797	ASRP	9/17/97	-	5.5	1	10.1	8.38	9.79	6.96	52.8	0.03	74.6	-	385
CDA River	3997	ASRA	9/29/97	-	6	11	0.2	9.72	16.01	7.37	52.6	0.03	99.4	-	414
CDA River	3997	ASRA	9/29/97	-	6	10	1.8	9.66	15.76	7.36	52.2	0.03	98.4	-	415
CDA River	3997	ASRA	9/29/97	-	6	9	2.8	9.66	15.71	7.33	53.3	0.03	98.3	-	415
CDA River	3997	ASRA	9/29/97	-	6	8	3.8	9.62	15.66	7.31	53.9	0.03	97.8	-	415
CDA River	3997	ASRA	9/29/97	-	6	7	4.8	9.59	15.61	7.29	53.4	0.03	97.4	-	415
CDA River	3997	ASRA	9/29/97	-	6	6	5.9	9.56	15.54	7.26	53.8	0.03	97	-	414
CDA River	3997	ASRA	9/29/97	-	6	5	6.8	9.62	15.52	7.23	56.7	0.04	97.5	-	414
CDA River	3997	ASRA	9/29/97	-	6	4	7.8	9.74	15.12	7.15	64.5	0.04	97.9	-	416
CDA River	3997	ASRA	9/29/97	-	6	3	8.8	9.62	14.99	7.03	68	0.04	96.5	-	419
CDA River	3997	ASRA	9/29/97	-	6	2	9.8	7.74	12.13	6.9	48.6	0.03	72.8	-	425
CDA River	3997	ASRA	9/29/97	-	6	1	10.8	7.85	10.26	6.97	44.5	0.03	70.6	-	424
CDA River	4297	DBAS	10/21/97	-	6	11	0.3	10.11	11.79	7.24	54.6	0.03	92.3	-	371
CDA River	4297	DBAS	10/21/97	-	6	10	1	10.1	11.81	7.27	54.6	0.03	92.2	-	369

CDA River	4297	DBAS	10/21/97	-	6	9	2	10.11	11.81	7.23	54.8	0.04	92.4	-	370
CDA River	4297	DBAS	10/21/97	-	6	8	3	10.08	11.81	7.24	54.7	0.04	92.1	-	369
CDA River	4297	DBAS	10/21/97	-	6	7	4.1	10.12	11.77	7.22	55.3	0.04	92.4	-	369
CDA River	4297	DBAS	10/21/97	-	6	6	5	10.13	11.74	7.19	55.7	0.04	92.4	-	370
CDA River	4297	DBAS	10/21/97	-	6	5	6	10.16	11.68	7.18	56.7	0.04	92.5	-	370
CDA River	4297	DBAS	10/21/97	-	6	4	7	10.17	11.59	7.17	57.9	0.04	92.5	-	369
CDA River	4297	DBAS	10/21/97	-	6	3	8	10.17	11.59	7.13	57.9	0.04	92.5	-	370
CDA River	4297	DBAS	10/21/97	-	6	2	9	10.22	11.41	7.1	63.2	0.04	92.5	-	371
CDA River	4297	DBAS	10/21/97	-	6	1	10	10.23	10.94	7.01	81.3	0.05	91.6	-	379
CDA River	4497	DBAS	11/4/97	-	3.8	11	0.4	10.87	10.02	7.35	53.9	0.03	95.5	54	392
CDA River	4497	DBAS	11/4/97	-	3.8	10	1.5	10.94	9.79	7.34	53.7	0.03	95.5	50	393
CDA River	4497	DBAS	11/4/97	-	3.8	9	2.5	10.87	9.79	7.37	53.7	0.03	94.9	146	392
CDA River	4497	DBAS	11/4/97	-	3.8	8	3.5	10.92	9.74	7.33	53.6	0.03	95.3	51	393
CDA River	4497	DBAS	11/4/97	-	3.8	7	4.5	10.88	9.68	7.28	53.7	0.03	94.8	102	395
CDA River	4497	DBAS	11/4/97	-	3.8	6	5.5	10.9	9.4	7.21	54.5	0.03	94.3	59	398
CDA River	4497	DBAS	11/4/97	-	3.8	5	6.5	10.91	9.38	7.26	54.6	0.03	94.3	121	395
CDA River	4497	DBAS	11/4/97	-	3.8	4	7.5	11	9.25	7.19	54.9	0.04	94.8	49	398
CDA River	4497	DBAS	11/4/97	-	3.8	3	8.5	11.23	8.55	7.14	57.3	0.04	95.1	42	401
CDA River	4497	DBAS	11/4/97	-	3.8	2	9.5	11.29	8.25	7.12	58.2	0.04	95	59	402
CDA River	4497	DBAS	11/4/97	-	3.8	1	10.5	11.26	8.17	7.1	58.6	0.04	94.5	536	404

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Mid Lake CDA	1597	ASSS	4/18/97	-	2	10	0.4	12.33	6.36	7.36	44.6	0.03	99.9	-	377
Mid Lake CDA	1597	ASSS	4/18/97	-	2	9	1.4	12.36	6.3	7.35	45.2	0.03	*****	-	378
Mid Lake CDA	1597	ASSS	4/18/97	-	2	8	2.6	12.27	6.33	7.35	44.4	0.03	99.4	-	379
Mid Lake CDA	1597	ASSS	4/18/97	-	2	7	3.8	12.31	6.28	7.34	45.3	0.03	99.6	-	379
Mid Lake CDA	1597	ASSS	4/18/97	-	2	6	5.1	12.32	6.3	7.34	45.4	0.03	99.7	-	379
Mid Lake CDA	1597	ASSS	4/18/97	-	2	5	6.4	12.35	6.31	7.34	44.9	0.03	*****	-	379
Mid Lake CDA	1597	ASSS	4/18/97	-	2	4	7.5	12.43	6.31	7.33	44.6	0.03	*****	-	379
Mid Lake CDA	1597	ASSS	4/18/97	-	2	3	8.7	12.4	6.31	7.33	44.7	0.03	*****	-	378
Mid Lake CDA	1597	ASSS	4/18/97	-	2	2	10.1	12.44	6.26	7.32	44.8	0.03	*****	-	379
Mid Lake CDA	1597	ASSS	4/18/97	-	2	1	11.2	12.57	6.28	7.32	44.8	0.03	*****	-	378
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	15	0.2	12.04	13.83	6.33	0.7	0	115.5	-	422
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	14	1.5	11.12	10.32	7	28.2	0.02	98.5	-	392
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	13	3	11.1	9.86	7	28.8	0.02	97.3	-	392
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	12	4.5	11.16	9.79	6.99	28.3	0.02	97.5	-	392
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	11	6	11.1	9.51	6.98	29	0.02	96.4	-	393
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	10	7.5	11.04	9.25	6.98	29.4	0.02	95.3	-	392
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	9	9	11.04	9.17	6.99	29.6	0.02	95	-	391
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	8	10.5	11.08	8.92	7.02	30.7	0.02	94.8	-	389

Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	7	12	11.29	8.45	7.01	33.4	0.02	95.6	-	389
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	6	13.5	11.32	7.81	6.99	34.7	0.02	94.3	-	390
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	5	15	11.28	7.47	6.98	34.9	0.02	93.2	-	389
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	4	16.5	11.25	6.66	6.96	37.2	0.02	91.1	-	390
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	3	18	11.12	6.08	6.94	40.1	0.03	88.7	-	391
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	2	19.5	11.15	5.69	6.93	45.9	0.03	88.1	-	391
Mid Lake CDA	1997	DBAC	5/16/97	-	1.25	1	20.9	10.91	5.6	6.92	47.2	0.03	85.9	-	390
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	13	0.2	11.32	12.63	7.06	27.6	0.02	105.9	-	351
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	12	0.9	11.33	12.51	7.05	27.6	0.02	105.8	-	352
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	11	2.5	11.19	10.72	7	26.8	0.02	100.2	-	353
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	10	4	10.83	10.3	6.97	26.6	0.02	96	-	354
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	9	5.5	10.7	10.07	6.96	26.4	0.02	94.4	-	353
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	8	7	10.68	9.64	6.95	26.3	0.02	93.2	-	352
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	7	8.5	10.71	9.45	6.95	26.5	0.02	93	-	349
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	6	9.9	10.73	9.25	6.96	26.6	0.02	92.8	-	348
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	5	12.5	10.75	8.84	6.95	27	0.02	92	-	346
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	4	14.4	10.82	8.38	6.94	28.3	0.02	91.6	-	343
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	3	16.1	10.73	7.96	6.92	30.2	0.02	89.9	-	342
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	2	18.7	10.48	6.49	6.87	40.5	0.03	84.7	-	339
Mid Lake CDA	2197	DBSS	5/29/97	-	1.7	1	20.2	10.17	6.71	6.87	40.7	0.03	82.6	-	332
Mid Lake CDA	2397	DBAS	6/11/97	-	2	14	0.4	10.81	15.76	7.1	30.6	0.02	108.8	-	411
Mid Lake CDA	2397	DBAS	6/11/97	-	2	13	1.3	10.86	15.58	7.11	30.7	0.02	108.9	-	411
Mid Lake CDA	2397	DBAS	6/11/97	-	2	12	2.9	10.9	13.8	7.1	29.8	0.02	105.2	-	411
Mid Lake CDA	2397	DBAS	6/11/97	-	2	11	4.3	10.86	13.09	7.05	29.4	0.02	103	-	414
Mid Lake CDA	2397	DBAS	6/11/97	-	2	10	5.9	11.2	11.54	7.04	28.9	0.02	102.6	-	415
Mid Lake CDA	2397	DBAS	6/11/97	-	2	9	7.4	11	10.45	7.02	29	0.02	98.2	-	416
Mid Lake CDA	2397	DBAS	6/11/97	-	2	8	9	10.92	10.12	7	28.6	0.02	96.8	-	417
Mid Lake CDA	2397	DBAS	6/11/97	-	2	7	10.5	10.84	9.71	6.99	28.6	0.02	95.2	-	417
Mid Lake CDA	2397	DBAS	6/11/97	-	2	6	11.9	10.62	8.94	6.96	31.6	0.02	91.4	-	419
Mid Lake CDA	2397	DBAS	6/11/97	-	2	5	13.4	10.6	8.42	6.95	34.4	0.02	90.1	-	420
Mid Lake CDA	2397	DBAS	6/11/97	-	2	4	15	10.23	7.81	6.92	37.7	0.02	85.7	-	421
Mid Lake CDA	2397	DBAS	6/11/97	-	2	3	16.4	10.36	7.05	6.92	41.9	0.03	85.2	-	421
Mid Lake CDA	2397	DBAS	6/11/97	-	2	2	17.9	10.31	6.82	6.92	43.2	0.03	84.3	-	425
Mid Lake CDA	2397	DBAS	6/11/97	-	2	1	19.5	10.02	6.99	6.93	43.2	0.03	82.3	-	424
Mid Lake CDA	2597	DBSS	6/26/97	-	3	13	0.4	10.7	15.09	7.14	31.7	0.02	106.1	-	405
Mid Lake CDA	2597	DBSS	6/26/97	-	3	12	1.9	10.69	14.89	7.12	31.8	0.02	105.4	-	405
Mid Lake CDA	2597	DBSS	6/26/97	-	3	11	3.5	10.74	14.36	7.1	31.9	0.02	104.8	-	406
Mid Lake CDA	2597	DBSS	6/26/97	-	3	10	5	10.68	13.32	6.97	30.2	0.02	101.8	-	410
Mid Lake CDA	2597	DBSS	6/26/97	-	3	9	6.6	10.73	12.33	6.96	30.5	0.02	100	-	410
Mid Lake CDA	2597	DBSS	6/26/97	-	3	8	8.1	10.36	11.45	6.92	30.4	0.02	94.6	-	411
Mid Lake CDA	2597	DBSS	6/26/97	-	3	7	9.6	10.26	10.59	6.89	29.6	0.02	91.8	-	412

Mid Lake CDA	2597	DBSS	6/26/97	-	3	6	10.9	10.14	9.27	6.86	30.8	0.02	88	-	413
Mid Lake CDA	2597	DBSS	6/26/97	-	3	5	12.5	10.11	8.25	6.83	34.6	0.02	85.6	-	414
Mid Lake CDA	2597	DBSS	6/26/97	-	3	4	14	9.57	7.53	6.81	38	0.02	79.6	-	414
Mid Lake CDA	2597	DBSS	6/26/97	-	3	3	15.6	9.44	7.05	6.8	40.5	0.03	77.7	-	413
Mid Lake CDA	2597	DBSS	6/26/97	-	3	2	17	9.03	6.82	6.8	42.4	0.03	73.8	-	411
Mid Lake CDA	2597	DBSS	6/26/97	-	3	1	18.6	9.08	6.81	6.86	42.4	0.03	74.1	-	407
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	13	0.3	9.95	19.4	7.02	35.5	0.02	*****	-	444
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	12	1.7	10.11	17.84	7	34.8	0.02	*****	-	445
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	11	3.3	10.29	17.17	6.92	35	0.02	*****	-	447
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	10	4.8	10.55	14.84	6.81	38.2	0.02	*****	-	451
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	9	6.2	10.41	13.81	6.77	35.6	0.02	99.9	-	451
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	8	7.8	10.26	13.02	6.7	34.6	0.02	96.7	-	451
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	7	9.2	10.03	12.2	6.66	33.4	0.02	92.8	-	451
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	6	10.8	9.78	10.8	6.6	33.3	0.02	87.6	-	450
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	5	12.2	9.53	9.76	6.57	34.5	0.02	83.3	-	450
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	4	13.7	9.55	8.95	6.54	36.6	0.02	82	-	448
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	3	15.3	9.33	8.46	6.52	38.2	0.02	79.1	-	447
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	2	16.6	9.28	7.91	6.49	39.8	0.03	77.7	-	445
Mid Lake CDA	2797	DBSS	7/8/97	-	2.4	1	18.2	9.37	7.51	6.47	42	0.03	77.6	-	447
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	13	1.3	9.57	21.01	7.48	38.8	0.02	*****	-	394
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	12	2.8	9.92	20.47	7.43	37.9	0.02	*****	-	393
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	11	4.3	10.52	17.56	7.27	37.7	0.02	*****	-	400
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	10	5.8	10.49	16.73	7.18	36.2	0.02	*****	-	402
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	9	7.3	10.22	15.79	7.03	35.2	0.02	*****	-	406
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	8	8.8	9.96	15.01	6.95	34.4	0.02	98.2	-	408
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	7	10.3	9.14	13.61	6.84	33.2	0.02	87.5	-	411
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	6	11.8	9.33	11.29	6.79	33.2	0.02	84.6	-	414
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	5	13.3	8.89	9.48	6.78	35.2	0.02	77.3	-	414
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	4	14.3	9.1	8.22	6.8	37.7	0.02	76.7	-	413
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	3	15.8	9.07	8.17	6.83	37.8	0.02	76.4	-	411
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	2	17.3	9.15	7.95	6.87	38.3	0.02	76.6	-	414
Mid Lake CDA	2997	SSJD	7/24/97	-	4.5	1	18.8	9.24	7.46	6.93	39.7	0.03	76.2	-	422
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	14	0.4	9.23	24.49	7.8	41.3	0.03	109.2	-	345
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	13	1	9.29	23.73	7.7	41.5	0.03	108.4	-	348
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	12	2.6	9.34	22.74	7.49	43.4	0.03	106.9	-	354
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	11	4	9.57	21.92	7.41	49.1	0.03	107.8	-	357
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	10	5.5	9.89	20.76	7.43	41.8	0.03	108.9	-	354
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	9	7	10.15	19.78	7.29	39.8	0.03	109.7	-	356
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	8	8.6	10.13	17.86	7.05	36.9	0.02	105.4	-	361
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	7	10	9.33	15.01	6.96	34.5	0.02	91.3	-	364
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	6	11.5	8.92	12.66	6.9	34.4	0.02	82.9	-	364

Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	5	13.1	8.74	10.18	6.88	35.9	0.02	76.7	-	361
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	4	14.5	8.58	9.05	6.91	37.2	0.02	73.3	-	357
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	3	16.1	8.76	8.04	6.94	38.9	0.02	73	-	354
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	2	17.5	8.83	7.94	6.99	39	0.03	73.5	-	347
Mid Lake CDA	3197	DBSS	8/5/97	-	5.6	1	18.9	8.88	8.18	7.08	39	0.03	74	-	374
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	13	0.5	8.7	22.93	7.65	45.4	0.03	100.6	-	361
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	12	2	8.72	22.56	7.6	45.2	0.03	100.1	-	362
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	11	3.5	8.77	22.29	7.56	45	0.03	100.2	-	362
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	10	5	8.81	22.12	7.44	45	0.03	100.4	-	365
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	9	6.5	8.87	21.44	7.28	49.4	0.03	99.7	-	370
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	8	8	9.05	20.09	7.19	42.6	0.03	99.1	-	373
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	7	9.5	9.2	18.61	7.05	38.7	0.02	97.7	-	374
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	6	11	8.12	14.03	6.91	35.4	0.02	78.3	-	379
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	5	12.5	7.96	10.62	6.9	36.8	0.02	71.1	-	380
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	4	14	7.79	9.22	6.93	38.5	0.02	67.3	-	378
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	3	15.5	7.71	8.49	6.97	39.3	0.03	65.4	-	376
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	2	17	7.29	8.15	7.08	40.1	0.03	61.3	-	370
Mid Lake CDA	3297	DBSS	8/13/97	-	6.5	1	18.7	8.21	7.69	6.92	41.3	0.03	68.3	-	393
Mid Lake CDA	3497	DBSS	8/27/97	-	8	13	0.4	9.08	21.49	7.54	50.5	0.03	102.3	-	353
Mid Lake CDA	3497	DBSS	8/27/97	-	8	12	1.1	9.08	21.48	7.54	50.4	0.03	102.2	-	353
Mid Lake CDA	3497	DBSS	8/27/97	-	8	11	2.4	9.08	21.42	7.53	50.4	0.03	102.1	-	353
Mid Lake CDA	3497	DBSS	8/27/97	-	8	10	4.1	9.09	21.28	7.52	50.7	0.03	102	-	353
Mid Lake CDA	3497	DBSS	8/27/97	-	8	9	5.6	9.1	21.18	7.5	50.7	0.03	101.9	-	353
Mid Lake CDA	3497	DBSS	8/27/97	-	8	8	6.9	9.1	21.11	7.46	50.7	0.03	101.7	-	354
Mid Lake CDA	3497	DBSS	8/27/97	-	8	7	8.5	8.96	21.05	7.33	49.9	0.03	100.1	-	358
Mid Lake CDA	3497	DBSS	8/27/97	-	8	6	10	8.48	20.3	7.17	48.7	0.03	93.4	-	363
Mid Lake CDA	3497	DBSS	8/27/97	-	8	5	11.5	8.19	19.32	7.01	45.8	0.03	88.4	-	370
Mid Lake CDA	3497	DBSS	8/27/97	-	8	4	12.9	8.39	15.84	6.91	40.1	0.03	84.2	-	375
Mid Lake CDA	3497	DBSS	8/27/97	-	8	3	14.4	6.45	12.02	6.88	40.9	0.03	59.5	-	379
Mid Lake CDA	3497	DBSS	8/27/97	-	8	2	15.9	6.81	9.48	6.95	42.1	0.03	59.2	-	377
Mid Lake CDA	3497	DBSS	8/27/97	-	8	1	17.4	6.69	9.22	7.07	42.6	0.03	57.8	-	373
Mid Lake CDA	3797	ASRP	9/17/97	-	5	11	0.2	8.99	16.75	7.02	49.9	0.03	93.5	-	384
Mid Lake CDA	3797	ASRP	9/17/97	-	5	10	1	8.9	16.75	6.94	49.9	0.03	92.6	-	386
Mid Lake CDA	3797	ASRP	9/17/97	-	5	9	3	8.75	16.43	6.79	49.7	0.03	90.4	-	392
Mid Lake CDA	3797	ASRP	9/17/97	-	5	8	5	8.08	10.87	6.71	43.5	0.03	73.4	-	398
Mid Lake CDA	3797	ASRP	9/17/97	-	5	7	7	8.27	9.37	6.69	42.7	0.03	72.8	-	399
Mid Lake CDA	3797	ASRP	9/17/97	-	5	6	9	8.19	8.88	6.7	43.4	0.03	71.3	-	399
Mid Lake CDA	3797	ASRP	9/17/97	-	5	5	10.9	9	7.66	6.71	43.9	0.03	76.1	-	398
Mid Lake CDA	3797	ASRP	9/17/97	-	5	4	13	8.96	7.58	6.74	44.1	0.03	75.6	-	396
Mid Lake CDA	3797	ASRP	9/17/97	-	5	3	15	9.05	7.43	6.75	44.2	0.03	76.2	-	395
Mid Lake CDA	3797	ASRP	9/17/97	-	5	2	16.9	9.45	7.12	6.78	44.6	0.03	78.8	-	393

Mid Lake CDA	3797	ASRP	9/17/97	-	5	1	18.6	9.41	6.89	6.84	45.1	0.03	78	-	390
Mid Lake CDA	3997	ASRA	9/29/97	-	6.5	10	0.5	9.59	16.46	7.17	50.6	0.03	99.2	-	407
Mid Lake CDA	3997	ASRA	9/29/97	-	6.5	9	2.7	9.45	15.86	7.07	50.1	0.03	96.5	-	411
Mid Lake CDA	3997	ASRA	9/29/97	-	6.5	8	4.6	9.24	15.24	6.92	50.3	0.03	93.1	-	417
Mid Lake CDA	3997	ASRA	9/29/97	-	6.5	7	6.6	8.62	13.82	6.82	49.6	0.03	84.2	-	421
Mid Lake CDA	3997	ASRA	9/29/97	-	6.5	6	8.6	8.64	12.23	6.78	46.7	0.03	81.4	-	423
Mid Lake CDA	3997	ASRA	9/29/97	-	6.5	5	10.6	8.58	9.81	6.74	42.5	0.03	76.4	-	425
Mid Lake CDA	3997	ASRA	9/29/97	-	6.5	4	12.6	8.65	8.46	6.74	42	0.03	74.5	-	424
Mid Lake CDA	3997	ASRA	9/29/97	-	6.5	3	14.6	9.04	7.79	6.74	42	0.03	77.4	-	424
Mid Lake CDA	3997	ASRA	9/29/97	-	6.5	2	16.6	8.92	7.46	6.81	42.2	0.03	75	-	420
Mid Lake CDA	3997	ASRA	9/29/97	-	6.5	1	18.6	8.91	7.47	6.87	42.1	0.03	75	-	417
Mid Lake CDA	4297	DBAS	10/22/97	-	4.6	10	0.2	10.5	11.58	7.09	49	0.03	96	-	413
Mid Lake CDA	4297	DBAS	10/22/97	-	4.6	9	2	10.48	11.59	7.1	48.9	0.03	95.8	-	412
Mid Lake CDA	4297	DBAS	10/22/97	-	4.6	8	4	10.47	11.59	7.06	49.1	0.03	95.7	-	413
Mid Lake CDA	4297	DBAS	10/22/97	-	4.6	7	6	10.45	11.58	7.02	49.1	0.03	95.5	-	414
Mid Lake CDA	4297	DBAS	10/22/97	-	4.6	6	8	10.43	11.59	7	49.2	0.03	95.3	-	414
Mid Lake CDA	4297	DBAS	10/22/97	-	4.6	5	10	10.42	11.58	6.94	49.2	0.03	95.2	-	415
Mid Lake CDA	4297	DBAS	10/22/97	-	4.6	4	12	10.4	11.56	6.88	49.2	0.03	95	-	417
Mid Lake CDA	4297	DBAS	10/22/97	-	4.6	3	14	10.37	11.56	6.82	49.2	0.03	94.8	-	418
Mid Lake CDA	4297	DBAS	10/22/97	-	4.6	2	16	10.21	11.51	6.69	49.3	0.03	93.2	-	421
Mid Lake CDA	4297	DBAS	10/22/97	-	4.6	1	18	4.53	8.53	6.32	45.1	0.03	38.5	-	434
Mid Lake CDA	4497	DBAS	11/4/97	-	4	13	0.5	10.64	10.18	7.08	53.4	0.03	93.8	104	396
Mid Lake CDA	4497	DBAS	11/4/97	-	4	12	2	10.49	9.51	7.02	53.4	0.03	91	56	398
Mid Lake CDA	4497	DBAS	11/4/97	-	4	11	3.5	10.25	9.4	6.97	53.7	0.03	88.7	55	401
Mid Lake CDA	4497	DBAS	11/4/97	-	4	10	5	10.05	9.32	6.94	53.7	0.03	86.7	49	401
Mid Lake CDA	4497	DBAS	11/4/97	-	4	9	6.5	9.89	9.24	6.9	53.4	0.03	85.2	120	402
Mid Lake CDA	4497	DBAS	11/4/97	-	4	8	8	8.86	9.01	6.85	52.9	0.03	75.9	119	403
Mid Lake CDA	4497	DBAS	11/4/97	-	4	7	9.5	9.57	8.71	6.85	54.6	0.03	81.4	102	403
Mid Lake CDA	4497	DBAS	11/4/97	-	4	6	11	9.28	8.6	6.84	53.2	0.03	78.8	58	403
Mid Lake CDA	4497	DBAS	11/4/97	-	4	5	12.5	9.13	8.5	6.79	52.6	0.03	77.3	102	405
Mid Lake CDA	4497	DBAS	11/4/97	-	4	4	14	9.01	8.43	6.75	52.1	0.03	76.2	227	406
Mid Lake CDA	4497	DBAS	11/4/97	-	4	3	15.5	8.76	7.68	6.72	47.9	0.03	72.6	51	407
Mid Lake CDA	4497	DBAS	11/4/97	-	4	2	17	8.81	7.38	6.72	46.3	0.03	72.6	58	408
Mid Lake CDA	4497	DBAS	11/4/97	-	4	1	18.4	8.78	7.27	6.75	46.2	0.03	72.1	713	407

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Carey Bay	1597	ASSS	4/18/97	-	1.9	10	0.4	12.31	6.22	7.43	38.4	0.02	99.4	-	374
Carey Bay	1597	ASSS	4/18/97	-	1.9	9	1	12.3	6.07	7.41	38.5	0.02	99	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	8	2	12.29	5.77	7.41	38.2	0.02	98.1	-	375

Carey Bay	1597	ASSS	4/18/97	-	1.9	7	3.1	12.21	5.64	7.41	38.4	0.02	97.2	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	6	4.3	12.2	5.6	7.4	38.3	0.02	97	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	5	5.5	12.14	5.57	7.39	38.2	0.02	96.6	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	4	6.8	12.15	5.56	7.39	38.3	0.02	96.5	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	3	8.1	12.12	5.54	7.38	38.4	0.02	96.2	-	375
Carey Bay	1597	ASSS	4/18/97	-	1.9	2	9.3	12.12	5.49	7.38	38.4	0.02	96.1	-	374
Carey Bay	1597	ASSS	4/18/97	-	1.9	1	10.5	12.09	5.47	7.37	38.5	0.02	95.8	-	374
Carey Bay	1997	DBAC	5/16/97	-	1.6	12	0.2	11.52	15.54	7.11	35.1	0.02	114.7	-	389
Carey Bay	1997	DBAC	5/16/97	-	1.6	11	1	11.94	11.22	7.15	33.5	0.02	107.9	-	390
Carey Bay	1997	DBAC	5/16/97	-	1.6	10	2	12.11	10.1	7.1	33.6	0.02	106.7	-	392
Carey Bay	1997	DBAC	5/16/97	-	1.6	9	3.5	11.57	9.45	7.05	32.8	0.02	100.3	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	8	5	11.39	9.02	7.02	33.9	0.02	97.7	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	7	6.5	11.37	8.88	7.01	34.2	0.02	97.2	-	396
Carey Bay	1997	DBAC	5/16/97	-	1.6	6	8	11.34	8.69	7.01	34.6	0.02	96.6	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	5	9.5	11.36	8.33	7	34.4	0.02	95.8	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	4	11	11.32	8.07	6.99	34.8	0.02	95	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	3	12.5	11.24	7.83	6.98	34.8	0.02	93.7	-	395
Carey Bay	1997	DBAC	5/16/97	-	1.6	2	14	10.99	7.61	6.96	35.2	0.02	91	-	396
Carey Bay	1997	DBAC	5/16/97	-	1.6	1	15.3	10.38	6.86	6.95	37.3	0.02	84.5	-	396
Carey Bay	2197	DBSS	5/29/97	-	1.4	14	0.3	10.67	14.15	6.97	28.5	0.02	103.3	-	366
Carey Bay	2197	DBSS	5/29/97	-	1.4	13	1	11.21	10.91	6.99	26.2	0.02	100.9	-	366
Carey Bay	2197	DBSS	5/29/97	-	1.4	12	2.1	10.88	10.38	6.97	26.3	0.02	96.7	-	367
Carey Bay	2197	DBSS	5/29/97	-	1.4	11	3.1	10.63	10.2	6.94	26.3	0.02	94.1	-	368
Carey Bay	2197	DBSS	5/29/97	-	1.4	10	4.1	10.64	9.86	6.91	26.2	0.02	93.3	-	369
Carey Bay	2197	DBSS	5/29/97	-	1.4	9	5.1	10.43	9.79	6.92	26.4	0.02	91.3	-	368
Carey Bay	2197	DBSS	5/29/97	-	1.4	8	6.2	10.43	9.74	6.93	26.5	0.02	91.3	-	368
Carey Bay	2197	DBSS	5/29/97	-	1.4	7	7.2	10.61	9.64	6.92	26.3	0.02	92.6	-	367
Carey Bay	2197	DBSS	5/29/97	-	1.4	6	8.2	10.61	9.53	6.94	26.4	0.02	92.4	-	366
Carey Bay	2197	DBSS	5/29/97	-	1.4	5	9.2	10.64	9.43	6.93	26.4	0.02	92.4	-	366
Carey Bay	2197	DBSS	5/29/97	-	1.4	4	10.2	10.64	9.3	6.93	26.5	0.02	92.1	-	366
Carey Bay	2197	DBSS	5/29/97	-	1.4	3	11.2	10.61	9.12	6.94	26.7	0.02	91.5	-	365
Carey Bay	2197	DBSS	5/29/97	-	1.4	2	12.3	10.56	8.86	6.93	27.5	0.02	90.3	-	365
Carey Bay	2197	DBSS	5/29/97	-	1.4	1	13.2	10.64	8.66	6.94	27.8	0.02	90.7	-	364
Carey Bay	2397	DBAS	6/11/97	-	2	14	0.7	10.87	15.48	7.17	31.2	0.02	108.7	-	411
Carey Bay	2397	DBAS	6/11/97	-	2	13	1.6	11.2	14.35	7.1	30.9	0.02	109.3	-	414
Carey Bay	2397	DBAS	6/11/97	-	2	12	2.5	11.22	11.79	7.09	29.1	0.02	103.4	-	415
Carey Bay	2397	DBAS	6/11/97	-	2	11	3.5	11.32	11.3	7.07	28.9	0.02	103.2	-	416
Carey Bay	2397	DBAS	6/11/97	-	2	10	4.5	11.27	11.22	7.06	28.8	0.02	102.5	-	417
Carey Bay	2397	DBAS	6/11/97	-	2	9	5.5	10.97	10.99	7.03	28.8	0.02	99.2	-	418
Carey Bay	2397	DBAS	6/11/97	-	2	8	6.5	10.9	10.38	7.01	28.8	0.02	97.2	-	419
Carey Bay	2397	DBAS	6/11/97	-	2	7	7.5	10.84	10.17	7.01	28.7	0.02	96.2	-	419

Carey Bay	2397	DBAS	6/11/97	-	2	6	8.5	10.69	9.91	6.98	28.9	0.02	94.2	-	420
Carey Bay	2397	DBAS	6/11/97	-	2	5	9.5	10.63	9.45	6.98	29.4	0.02	92.7	-	420
Carey Bay	2397	DBAS	6/11/97	-	2	4	10.5	10.61	9.22	6.97	30.2	0.02	92	-	421
Carey Bay	2397	DBAS	6/11/97	-	2	3	11.4	10.58	8.99	6.97	31.1	0.02	91.2	-	421
Carey Bay	2397	DBAS	6/11/97	-	2	2	12.5	10.56	8.84	6.96	31.9	0.02	90.6	-	421
Carey Bay	2397	DBAS	6/11/97	-	2	1	13.4	10.14	8.11	6.95	36.1	0.02	85.6	-	423
Carey Bay	2597	DBSS	6/26/97	-	2.5	12	0.3	10.81	14.98	7.2	30.4	0.02	106.8	-	427
Carey Bay	2597	DBSS	6/26/97	-	2.5	11	0.9	10.81	14.93	7.17	30.4	0.02	106.8	-	429
Carey Bay	2597	DBSS	6/26/97	-	2.5	10	1.8	10.85	14.49	7.11	30.2	0.02	106.1	-	432
Carey Bay	2597	DBSS	6/26/97	-	2.5	9	2.8	10.91	13.73	7.12	29.9	0.02	104.9	-	431
Carey Bay	2597	DBSS	6/26/97	-	2.5	8	3.8	10.94	13.11	7.1	29.8	0.02	103.8	-	432
Carey Bay	2597	DBSS	6/26/97	-	2.5	7	4.8	10.91	12.73	7.06	29.6	0.02	102.6	-	434
Carey Bay	2597	DBSS	6/26/97	-	2.5	6	5.7	10.84	12.33	6.99	29.8	0.02	101.1	-	436
Carey Bay	2597	DBSS	6/26/97	-	2.5	5	6.8	10.61	11.74	6.94	29.5	0.02	97.5	-	438
Carey Bay	2597	DBSS	6/26/97	-	2.5	4	7.7	10.42	10.66	6.92	29.3	0.02	93.4	-	440
Carey Bay	2597	DBSS	6/26/97	-	2.5	3	8.7	10.01	10.1	6.89	29.9	0.02	88.6	-	441
Carey Bay	2597	DBSS	6/26/97	-	2.5	2	9.7	9.88	9.97	6.91	30.4	0.02	87.1	-	440
Carey Bay	2597	DBSS	6/26/97	-	2.5	1	10.6	9.78	9.66	6.92	31.3	0.02	85.6	-	440
Carey Bay	2797	DBSS	7/8/97	-	2.9	13	0.3	10.09	18.7	7.18	36.8	0.02	*****	-	444
Carey Bay	2797	DBSS	7/8/97	-	2.9	12	1.1	10.09	18.66	7.17	36.9	0.02	*****	-	444
Carey Bay	2797	DBSS	7/8/97	-	2.9	11	1.9	10.24	17.47	7.13	36.3	0.02	*****	-	446
Carey Bay	2797	DBSS	7/8/97	-	2.9	10	2.9	10.39	16.41	7.09	37.1	0.02	*****	-	449
Carey Bay	2797	DBSS	7/8/97	-	2.9	9	3.9	10.25	16.19	7.04	37.4	0.02	*****	-	450
Carey Bay	2797	DBSS	7/8/97	-	2.9	8	5	10.47	15.01	7.01	36.9	0.02	*****	-	452
Carey Bay	2797	DBSS	7/8/97	-	2.9	7	5.9	10.37	14.42	6.97	35.9	0.02	*****	-	454
Carey Bay	2797	DBSS	7/8/97	-	2.9	6	7.1	10.16	13.17	6.94	34.3	0.02	96.2	-	455
Carey Bay	2797	DBSS	7/8/97	-	2.9	5	8	10	12.81	6.93	34.2	0.02	93.9	-	456
Carey Bay	2797	DBSS	7/8/97	-	2.9	4	9	9.91	12.15	6.91	33.4	0.02	91.7	-	457
Carey Bay	2797	DBSS	7/8/97	-	2.9	3	10	9.55	11.25	6.9	33	0.02	86.5	-	458
Carey Bay	2797	DBSS	7/8/97	-	2.9	2	11	9.03	9.98	6.91	34.7	0.02	79.4	-	460
Carey Bay	2797	DBSS	7/8/97	-	2.9	1	11.9	9.2	9.77	6.97	35.1	0.02	80.4	-	457
Carey Bay	2997	SSJD	7/24/97	-	5.5	14	0.3	9.94	20.53	7.53	40	0.03	*****	-	408
Carey Bay	2997	SSJD	7/24/97	-	5.5	13	0.8	9.99	20.55	7.51	40	0.03	*****	-	408
Carey Bay	2997	SSJD	7/24/97	-	5.5	12	1.8	10.43	19.63	7.5	39.7	0.03	*****	-	410
Carey Bay	2997	SSJD	7/24/97	-	5.5	11	2.8	10.53	18.87	7.48	38.4	0.02	*****	-	410
Carey Bay	2997	SSJD	7/24/97	-	5.5	10	3.7	10.45	18.25	7.34	38.9	0.02	*****	-	414
Carey Bay	2997	SSJD	7/24/97	-	5.5	9	4.8	10.36	17.29	7.24	37.6	0.02	*****	-	418
Carey Bay	2997	SSJD	7/24/97	-	5.5	8	5.8	10.3	16.48	7.19	36.7	0.02	*****	-	419
Carey Bay	2997	SSJD	7/24/97	-	5.5	7	6.7	10.29	16.07	7.16	36	0.02	*****	-	419
Carey Bay	2997	SSJD	7/24/97	-	5.5	6	7.9	9.77	15.61	7.07	35.2	0.02	97.7	-	422
Carey Bay	2997	SSJD	7/24/97	-	5.5	5	8.4	10.09	15.67	7.02	35.3	0.02	*****	-	422

Carey Bay	2997	SSJD	7/24/97	-	5.5	4	9.4	9.66	14.52	6.98	33.7	0.02	94.3	-	423
Carey Bay	2997	SSJD	7/24/97	-	5.5	3	10.4	9.48	13.88	6.94	33.3	0.02	91.2	-	424
Carey Bay	2997	SSJD	7/24/97	-	5.5	2	11.4	8.87	12.67	6.91	33.1	0.02	83	-	426
Carey Bay	2997	SSJD	7/24/97	-	5.5	1	12.4	7.87	10.18	6.93	36.1	0.02	69.6	-	427
Carey Bay	3197	DBSS	8/5/97	-	5.3	12	0.3	9.47	23.01	7.6	43.4	0.03	109	-	364
Carey Bay	3197	DBSS	8/5/97	-	5.3	11	1	9.51	22.72	7.59	43.5	0.03	108.8	-	365
Carey Bay	3197	DBSS	8/5/97	-	5.3	10	2.1	9.61	22.15	7.53	43.8	0.03	108.7	-	366
Carey Bay	3197	DBSS	8/5/97	-	5.3	9	3	9.66	21.88	7.5	42.6	0.03	108.8	-	367
Carey Bay	3197	DBSS	8/5/97	-	5.3	8	3.9	9.81	21.53	7.47	43.8	0.03	109.7	-	368
Carey Bay	3197	DBSS	8/5/97	-	5.3	7	4.9	9.89	21.11	7.42	43	0.03	109.5	-	369
Carey Bay	3197	DBSS	8/5/97	-	5.3	6	6	9.91	20.84	7.34	41.5	0.03	109.4	-	371
Carey Bay	3197	DBSS	8/5/97	-	5.3	5	6.9	9.66	19.4	7.27	39.5	0.03	103.6	-	374
Carey Bay	3197	DBSS	8/5/97	-	5.3	4	7.9	10.34	18.36	7.26	37.2	0.02	108.6	-	373
Carey Bay	3197	DBSS	8/5/97	-	5.3	3	9	9.68	17.1	7.14	36.6	0.02	99.1	-	377
Carey Bay	3197	DBSS	8/5/97	-	5.3	2	10	8.87	15.07	7.06	35.5	0.02	86.9	-	380
Carey Bay	3197	DBSS	8/5/97	-	5.3	1	11	7.89	14.19	7.1	35.6	0.02	75.9	-	381
Carey Bay	3297	DBSS	8/14/97	-	8	13	0.4	8.59	22.47	7.5	45.1	0.03	98.4	-	378
Carey Bay	3297	DBSS	8/14/97	-	8	12	1.4	8.6	22.43	7.54	45.1	0.03	98.5	-	376
Carey Bay	3297	DBSS	8/14/97	-	8	11	2.4	8.65	22.33	7.47	45.1	0.03	98.9	-	377
Carey Bay	3297	DBSS	8/14/97	-	8	10	3.3	8.67	22.22	7.42	45.3	0.03	98.8	-	378
Carey Bay	3297	DBSS	8/14/97	-	8	9	4.3	8.66	21.9	7.3	45.9	0.03	98.2	-	383
Carey Bay	3297	DBSS	8/14/97	-	8	8	5.3	8.61	21.55	7.25	45.7	0.03	97	-	385
Carey Bay	3297	DBSS	8/14/97	-	8	7	6.4	8.62	21.19	7.2	45.6	0.03	96.4	-	386
Carey Bay	3297	DBSS	8/14/97	-	8	6	7.4	8.39	20.53	7.15	43	0.03	92.6	-	388
Carey Bay	3297	DBSS	8/14/97	-	8	5	8.4	8.64	19.56	7.01	40.1	0.03	93.5	-	391
Carey Bay	3297	DBSS	8/14/97	-	8	4	9.4	8.27	18.94	6.95	39.7	0.03	88.4	-	393
Carey Bay	3297	DBSS	8/14/97	-	8	3	10.4	8.26	18.41	6.88	38.9	0.02	87.5	-	395
Carey Bay	3297	DBSS	8/14/97	-	8	2	11.5	7.89	15.96	6.83	36.5	0.02	79.3	-	398
Carey Bay	3297	DBSS	8/14/97	-	8	1	12.4	6.74	13.07	6.82	37.1	0.02	62.7	-	401
Carey Bay	3497	DBSS	8/27/97	-	8.2	14	0.3	8.97	21.76	7.5	49.7	0.03	101.6	-	356
Carey Bay	3497	DBSS	8/27/97	-	8.2	13	0.9	8.98	21.74	7.52	49.6	0.03	101.6	-	355
Carey Bay	3497	DBSS	8/27/97	-	8.2	12	1.9	8.99	21.67	7.5	49.6	0.03	101.6	-	356
Carey Bay	3497	DBSS	8/27/97	-	8.2	11	2.9	9	21.53	7.45	49.8	0.03	101.5	-	358
Carey Bay	3497	DBSS	8/27/97	-	8.2	10	3.9	8.93	21.37	7.43	49.3	0.03	100.4	-	358
Carey Bay	3497	DBSS	8/27/97	-	8.2	9	4.9	8.91	21.26	7.39	49.3	0.03	99.9	-	359
Carey Bay	3497	DBSS	8/27/97	-	8.2	8	6.1	8.89	21.09	7.36	49.3	0.03	99.4	-	360
Carey Bay	3497	DBSS	8/27/97	-	8.2	7	7	8.95	20.91	7.34	49.6	0.03	99.7	-	360
Carey Bay	3497	DBSS	8/27/97	-	8.2	6	8	8.92	20.84	7.28	49.5	0.03	99.2	-	362
Carey Bay	3497	DBSS	8/27/97	-	8.2	5	9	8.84	20.7	7.18	49.1	0.03	98.1	-	365
Carey Bay	3497	DBSS	8/27/97	-	8.2	4	10	8.6	20.42	7.08	48.3	0.03	95	-	370
Carey Bay	3497	DBSS	8/27/97	-	8.2	3	11	8.16	16.21	6.99	40.9	0.03	82.6	-	376

Carey Bay	3497	DBSS	8/27/97	-	8.2	2	11.9	8.02	15.24	7.04	40.2	0.03	79.5	-	374
Carey Bay	3497	DBSS	8/27/97	-	8.2	1	12.9	8.03	14.64	7.15	40.2	0.03	78.6	-	372
Carey Bay	3797	ASRP	9/17/97	-	3.5	13	0.5	8.05	14.69	6.76	44.3	0.03	80.1	-	408
Carey Bay	3797	ASRP	9/17/97	-	3.5	12	1.5	7.89	14.03	6.72	43.7	0.03	77.4	-	411
Carey Bay	3797	ASRP	9/17/97	-	3.5	11	2.5	7.64	11.22	6.71	42.5	0.03	70.3	-	413
Carey Bay	3797	ASRP	9/17/97	-	3.5	10	3.5	7.84	9.99	6.71	42.4	0.03	70.1	-	414
Carey Bay	3797	ASRP	9/17/97	-	3.5	9	4.6	8.21	9.33	6.7	42.9	0.03	72.1	-	415
Carey Bay	3797	ASRP	9/17/97	-	3.5	8	5.5	8.13	9.17	6.71	42.9	0.03	71.1	-	415
Carey Bay	3797	ASRP	9/17/97	-	3.5	7	6.5	8.2	9.1	6.72	43.1	0.03	71.8	-	415
Carey Bay	3797	ASRP	9/17/97	-	3.5	6	7.5	8.27	8.99	6.73	43.2	0.03	72.2	-	414
Carey Bay	3797	ASRP	9/17/97	-	3.5	5	8.5	8.31	8.89	6.75	43.3	0.03	72.3	-	414
Carey Bay	3797	ASRP	9/17/97	-	3.5	4	9.3	8.34	8.78	6.75	43.3	0.03	72.3	-	414
Carey Bay	3797	ASRP	9/17/97	-	3.5	3	10.7	8.67	8.6	6.77	43.5	0.03	75.2	-	413
Carey Bay	3797	ASRP	9/17/97	-	3.5	2	11.5	8.4	8.6	6.78	43.3	0.03	72.7	-	413
Carey Bay	3797	ASRP	9/17/97	-	3.5	1	12.5	8.46	8.48	6.82	43.4	0.03	73.3	-	412
Carey Bay	3997	ASRA	9/29/97	-	6.3	13	0.2	9.16	16.28	7.09	50	0.03	94.3	-	411
Carey Bay	3997	ASRA	9/29/97	-	6.3	12	1	9.09	15.89	7.08	49.9	0.03	92.9	-	411
Carey Bay	3997	ASRA	9/29/97	-	6.3	11	2	9.02	15.58	7.07	49.9	0.03	91.6	-	411
Carey Bay	3997	ASRA	9/29/97	-	6.3	10	3	8.95	15.44	7.04	50	0.03	90.6	-	412
Carey Bay	3997	ASRA	9/29/97	-	6.3	9	4	8.83	15.34	6.99	49.9	0.03	89.2	-	413
Carey Bay	3997	ASRA	9/29/97	-	6.3	8	5	8.59	15.11	6.92	49.4	0.03	86.3	-	415
Carey Bay	3997	ASRA	9/29/97	-	6.3	7	6	7.93	14.51	6.8	47.5	0.03	78.7	-	419
Carey Bay	3997	ASRA	9/29/97	-	6.3	6	7	7.68	12.41	6.77	44.2	0.03	72.7	-	421
Carey Bay	3997	ASRA	9/29/97	-	6.3	5	8	7.63	12.32	6.77	44.2	0.03	72.1	-	421
Carey Bay	3997	ASRA	9/29/97	-	6.3	4	9	7.56	12.14	6.77	43.9	0.03	71.1	-	420
Carey Bay	3997	ASRA	9/29/97	-	6.3	3	10	7.3	10.38	6.75	42.4	0.03	65.9	-	421
Carey Bay	3997	ASRA	9/29/97	-	6.3	2	11	7.79	8.86	6.84	42.2	0.03	67.8	-	419
Carey Bay	3997	ASRA	9/29/97	-	6.3	1	12	8.33	8.37	6.93	42.3	0.03	71.6	-	416
Carey Bay	4297	DBAS	10/22/97	-	4.5	10	0.3	10.25	11.54	7.25	49	0.03	93.6	-	401
Carey Bay	4297	DBAS	10/22/97	-	4.5	9	1.7	10.24	11.56	7.23	49.1	0.03	93.6	-	402
Carey Bay	4297	DBAS	10/22/97	-	4.5	8	2.7	10.24	11.54	7.24	49.2	0.03	93.5	-	401
Carey Bay	4297	DBAS	10/22/97	-	4.5	7	3.7	10.21	11.54	7.21	49.2	0.03	93.2	-	403
Carey Bay	4297	DBAS	10/22/97	-	4.5	6	4.7	10.18	11.54	7.23	49.1	0.03	93	-	402
Carey Bay	4297	DBAS	10/22/97	-	4.5	5	5.7	10.19	11.53	7.22	49.2	0.03	93	-	402
Carey Bay	4297	DBAS	10/22/97	-	4.5	4	6.7	10.19	11.53	7.22	49.3	0.03	93	-	402
Carey Bay	4297	DBAS	10/22/97	-	4.5	3	7.7	10.19	11.53	7.22	49.3	0.03	93	-	402
Carey Bay	4297	DBAS	10/22/97	-	4.5	2	8.7	10.1	11.53	7.21	49.3	0.03	92.2	-	403
Carey Bay	4297	DBAS	10/22/97	-	4.5	1	9.7	10.05	11.51	7.19	49.2	0.03	91.7	-	404
Carey Bay	4497	DBAS	11/4/97	-	3.8	13	0.4	10.06	9.87	7.07	53.3	0.03	88	56	389
Carey Bay	4497	DBAS	11/4/97	-	3.8	12	1.5	10.34	9.55	7.09	53.1	0.03	89.8	215	390

Carey Bay	4497	DBAS	11/4/97	-	3.8	11	2.5	10.46	9.5	7.12	52.9	0.03	90.7	54	390
Carey Bay	4497	DBAS	11/4/97	-	3.8	10	3.5	10.5	9.53	7.11	53	0.03	91.1	41	390
Carey Bay	4497	DBAS	11/4/97	-	3.8	9	4.5	10.5	9.45	7.12	52.9	0.03	90.9	56	389
Carey Bay	4497	DBAS	11/4/97	-	3.8	8	5.5	10.45	9.4	7.11	53	0.03	90.4	113	389
Carey Bay	4497	DBAS	11/4/97	-	3.8	7	6.5	10.28	9.33	7.06	53	0.03	88.8	103	390
Carey Bay	4497	DBAS	11/4/97	-	3.8	6	7.5	10.14	9.22	7.01	52.9	0.03	87.3	210	392
Carey Bay	4497	DBAS	11/4/97	-	3.8	5	8.5	9.65	8.89	6.93	53.1	0.03	82.5	101	393
Carey Bay	4497	DBAS	11/4/97	-	3.8	4	9.5	9.51	8.81	6.89	52.9	0.03	81.1	54	394
Carey Bay	4497	DBAS	11/4/97	-	3.8	3	10.6	9.08	8.58	6.86	52.4	0.03	77	37	395
Carey Bay	4497	DBAS	11/4/97	-	3.8	2	11.5	8.98	8.47	6.87	52.1	0.03	76	111	394

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Conkling Point	1597	ASSS	4/18/97	-	1.1	13	0.4	12.35	6.31	7.45	36.4	0.02	99.9	-	372
Conkling Point	1597	ASSS	4/18/97	-	1.1	12	1.9	12.27	6.23	7.43	36.4	0.02	99.2	-	373
Conkling Point	1597	ASSS	4/18/97	-	1.1	11	3.2	12.29	6.2	7.43	36.6	0.02	99.2	-	373
Conkling Point	1597	ASSS	4/18/97	-	1.1	10	4.5	12.27	6.13	7.43	36.7	0.02	98.7	-	373
Conkling Point	1597	ASSS	4/18/97	-	1.1	9	5.7	12.23	6.05	7.42	37	0.02	98.4	-	373
Conkling Point	1597	ASSS	4/18/97	-	1.1	8	7	12.26	5.97	7.41	37.4	0.02	98.4	-	374
Conkling Point	1597	ASSS	4/18/97	-	1.1	7	8.2	12.24	5.97	7.4	37.3	0.02	98.2	-	373
Conkling Point	1597	ASSS	4/18/97	-	1.1	6	9.4	12.26	5.9	7.4	37.6	0.02	98.2	-	373
Conkling Point	1597	ASSS	4/18/97	-	1.1	5	10.4	12.24	5.82	7.39	37.8	0.02	97.9	-	374
Conkling Point	1597	ASSS	4/18/97	-	1.1	4	11.8	12.21	5.62	7.38	38.2	0.02	97.1	-	374
Conkling Point	1597	ASSS	4/18/97	-	1.1	3	13.1	12.2	5.57	7.37	38.3	0.02	96.9	-	374
Conkling Point	1597	ASSS	4/18/97	-	1.1	2	14.4	12.14	5.51	7.36	38.2	0.02	96.3	-	374
Conkling Point	1597	ASSS	4/18/97	-	1.1	1	15.9	12.16	5.29	7.36	38.5	0.02	95.9	-	374
Conkling Point	1997	DBAC	5/16/97	-	0.8	12	0.2	10.99	11.35	6.99	28	0.02	99.6	-	367
Conkling Point	1997	DBAC	5/16/97	-	0.8	11	2.1	11.1	9.61	6.98	27.8	0.02	96.7	-	369
Conkling Point	1997	DBAC	5/16/97	-	0.8	10	3.9	11.09	9.46	7	27.8	0.02	96.2	-	368
Conkling Point	1997	DBAC	5/16/97	-	0.8	9	5.5	11.08	9.42	6.98	27.7	0.02	96	-	369
Conkling Point	1997	DBAC	5/16/97	-	0.8	8	7	11.05	9.35	6.97	27.9	0.02	95.6	-	369
Conkling Point	1997	DBAC	5/16/97	-	0.8	7	8.6	11.04	9.28	6.98	28.2	0.02	95.3	-	368
Conkling Point	1997	DBAC	5/16/97	-	0.8	6	10.1	11.03	9.28	6.97	28.2	0.02	95.3	-	368
Conkling Point	1997	DBAC	5/16/97	-	0.8	5	11.6	11.01	9.15	6.97	28.6	0.02	94.7	-	368
Conkling Point	1997	DBAC	5/16/97	-	0.8	4	13	11.03	8.35	6.95	31.4	0.02	93.1	-	369
Conkling Point	1997	DBAC	5/16/97	-	0.8	3	14.5	11.15	7.45	6.93	34.8	0.02	92.1	-	369
Conkling Point	1997	DBAC	5/16/97	-	0.8	2	16	10.71	6.08	6.89	41	0.03	85.6	-	372
Conkling Point	1997	DBAC	5/16/97	-	0.8	1	17.5	10.51	5.9	6.89	44.8	0.03	83.4	-	370
Conkling Point	2197	DBSS	5/29/97	-	1.8	12	0.2	11.09	11.41	7.01	26.9	0.02	101	-	362
Conkling Point	2197	DBSS	5/29/97	-	1.8	11	1.4	11.11	10.79	7.02	26.9	0.02	99.7	-	363
Conkling Point	2197	DBSS	5/29/97	-	1.8	10	2.9	11.16	10.36	7	26.8	0.02	99	-	364

Conkling Point	2197	DBSS	5/29/97	-	1.8	9	4.5	11.12	10.22	6.98	26.8	0.02	98.4	-	365
Conkling Point	2197	DBSS	5/29/97	-	1.8	8	6	11.12	10.05	6.96	26.9	0.02	98	-	365
Conkling Point	2197	DBSS	5/29/97	-	1.8	7	7.4	11.05	9.74	6.94	26.8	0.02	96.6	-	364
Conkling Point	2197	DBSS	5/29/97	-	1.8	6	8.9	11.01	9.61	6.93	26.9	0.02	96	-	364
Conkling Point	2197	DBSS	5/29/97	-	1.8	5	10.4	10.97	9.43	6.92	26.9	0.02	95.3	-	363
Conkling Point	2197	DBSS	5/29/97	-	1.8	4	12.1	10.89	8.96	6.91	27.2	0.02	93.5	-	362
Conkling Point	2197	DBSS	5/29/97	-	1.8	3	13.4	10.75	8.71	6.9	27.8	0.02	91.8	-	362
Conkling Point	2197	DBSS	5/29/97	-	1.8	2	15	10.75	7.97	6.88	31.3	0.02	90.1	-	361
Conkling Point	2197	DBSS	5/29/97	-	1.8	1	16.8	10.29	7.01	6.86	36	0.02	84.3	-	360
Conkling Point	2397	DBAS	6/11/97	-	2	12	0.2	10.9	15.61	7.09	30.8	0.02	109.4	-	395
Conkling Point	2397	DBAS	6/11/97	-	2	11	1	10.7	14.08	7.08	30.1	0.02	103.8	-	396
Conkling Point	2397	DBAS	6/11/97	-	2	10	2.5	10.95	12.4	7.06	29.4	0.02	102.2	-	398
Conkling Point	2397	DBAS	6/11/97	-	2	9	4	10.98	11.91	7.04	29.1	0.02	101.5	-	398
Conkling Point	2397	DBAS	6/11/97	-	2	8	5.3	10.87	11.77	6.99	29.2	0.02	100.1	-	399
Conkling Point	2397	DBAS	6/11/97	-	2	7	6.9	10.85	10.68	6.99	29.6	0.02	97.3	-	400
Conkling Point	2397	DBAS	6/11/97	-	2	6	8.3	10.82	9.94	6.98	29.1	0.02	95.5	-	399
Conkling Point	2397	DBAS	6/11/97	-	2	5	9.9	10.78	9.78	6.97	28.9	0.02	94.7	-	399
Conkling Point	2397	DBAS	6/11/97	-	2	4	11.4	10.73	9.33	6.96	29.8	0.02	93.3	-	398
Conkling Point	2397	DBAS	6/11/97	-	2	3	13	10.53	8.72	6.94	32.2	0.02	90.2	-	398
Conkling Point	2397	DBAS	6/11/97	-	2	2	14.5	10.48	8.47	6.93	33.3	0.02	89.3	-	398
Conkling Point	2397	DBAS	6/11/97	-	2	1	16.2	10.17	7.86	6.93	37.1	0.02	85.3	-	395
Conkling Point	2597	DBSS	6/26/97	-	2.5	16	0.4	10.79	15.18	7.23	30.6	0.02	107.1	-	421
Conkling Point	2597	DBSS	6/26/97	-	2.5	15	1	10.79	15.14	7.23	30.6	0.02	107.1	-	422
Conkling Point	2597	DBSS	6/26/97	-	2.5	14	2.2	10.8	14.94	7.21	30.7	0.02	106.7	-	424
Conkling Point	2597	DBSS	6/26/97	-	2.5	13	3.3	10.82	14.66	7.15	31	0.02	106.2	-	426
Conkling Point	2597	DBSS	6/26/97	-	2.5	12	4.2	10.75	14.46	7.11	30.9	0.02	105	-	427
Conkling Point	2597	DBSS	6/26/97	-	2.5	11	5.2	10.87	13.07	7.06	31.2	0.02	103	-	430
Conkling Point	2597	DBSS	6/26/97	-	2.5	10	6.2	10.75	12.66	7.02	30.8	0.02	101	-	431
Conkling Point	2597	DBSS	6/26/97	-	2.5	9	7.2	10.78	12.17	7	30.6	0.02	100.1	-	431
Conkling Point	2597	DBSS	6/26/97	-	2.5	8	8.2	10.73	12	6.95	30.8	0.02	99.3	-	431
Conkling Point	2597	DBSS	6/26/97	-	2.5	7	9.3	10.02	10.77	6.9	29.5	0.02	90	-	434
Conkling Point	2597	DBSS	6/26/97	-	2.5	6	10.2	10.21	9.2	6.83	31.2	0.02	88.4	-	435
Conkling Point	2597	DBSS	6/26/97	-	2.5	5	11.3	9.97	8.66	6.8	32.7	0.02	85.2	-	435
Conkling Point	2597	DBSS	6/26/97	-	2.5	4	12.4	9.36	8.27	6.78	35.8	0.02	79.3	-	436
Conkling Point	2597	DBSS	6/26/97	-	2.5	3	13.3	9.52	7.91	6.8	37.2	0.02	79.9	-	434
Conkling Point	2597	DBSS	6/26/97	-	2.5	2	14.4	9.05	7.56	6.8	38.9	0.02	75.3	-	434
Conkling Point	2597	DBSS	6/26/97	-	2.5	1	15.3	8.74	7.43	6.82	40.2	0.03	72.5	-	433
Conkling Point	2797	DBSS	7/8/97	-	2.8	16	0.3	10.17	18.54	7.16	36.5	0.02	*****	-	434
Conkling Point	2797	DBSS	7/8/97	-	2.8	15	1.1	10.15	18	7.13	35.6	0.02	*****	-	436
Conkling Point	2797	DBSS	7/8/97	-	2.8	14	2	10.31	17.25	7.11	36.3	0.02	*****	-	437
Conkling Point	2797	DBSS	7/8/97	-	2.8	13	3	10.36	16.56	7.09	36.9	0.02	*****	-	438

Conkling Point	2797	DBSS	7/8/97	-	2.8	12	3.9	10.45	16.12	7.06	36.7	0.02	*****	-	439
Conkling Point	2797	DBSS	7/8/97	-	2.8	11	5	10.41	15.54	7.02	36.3	0.02	*****	-	440
Conkling Point	2797	DBSS	7/8/97	-	2.8	10	6	10.41	14.52	7	35.3	0.02	*****	-	441
Conkling Point	2797	DBSS	7/8/97	-	2.8	9	7.1	10.1	13.28	6.92	33.6	0.02	95.9	-	444
Conkling Point	2797	DBSS	7/8/97	-	2.8	8	8	10.03	12.71	6.89	33.8	0.02	93.9	-	445
Conkling Point	2797	DBSS	7/8/97	-	2.8	7	9	9.76	12.11	6.87	33.3	0.02	90.2	-	446
Conkling Point	2797	DBSS	7/8/97	-	2.8	6	10	9.26	11.34	6.84	33.2	0.02	84	-	447
Conkling Point	2797	DBSS	7/8/97	-	2.8	5	11	8.94	10.69	6.84	33.3	0.02	79.9	-	447
Conkling Point	2797	DBSS	7/8/97	-	2.8	4	11.9	8.68	9.59	6.84	35	0.02	75.5	-	448
Conkling Point	2797	DBSS	7/8/97	-	2.8	3	12.8	8.73	8.72	6.86	36.7	0.02	74.5	-	447
Conkling Point	2797	DBSS	7/8/97	-	2.8	2	13.9	8.74	8.45	6.88	37.7	0.02	73.9	-	448
Conkling Point	2797	DBSS	7/8/97	-	2.8	1	14.9	8.73	8.22	6.92	38.6	0.02	73.6	-	446
Conkling Point	2997	SSJD	7/24/97	-	4.5	10	0.4	9.56	21.37	7.46	39.7	0.03	*****	-	408
Conkling Point	2997	SSJD	7/24/97	-	4.5	9	2	9.59	20.79	7.37	37.6	0.02	*****	-	411
Conkling Point	2997	SSJD	7/24/97	-	4.5	8	3.5	10.4	18.18	7.26	38.4	0.02	*****	-	417
Conkling Point	2997	SSJD	7/24/97	-	4.5	7	5	10.43	17.3	7.13	38	0.02	*****	-	420
Conkling Point	2997	SSJD	7/24/97	-	4.5	6	6.5	10	16.31	7.05	35.9	0.02	*****	-	422
Conkling Point	2997	SSJD	7/24/97	-	4.5	5	8	10.02	15.41	6.93	34.8	0.02	99.8	-	427
Conkling Point	2997	SSJD	7/24/97	-	4.5	4	9.5	9.46	12.97	6.83	32.6	0.02	89.2	-	431
Conkling Point	2997	SSJD	7/24/97	-	4.5	3	11	9.31	12.3	6.77	32	0.02	86.4	-	433
Conkling Point	2997	SSJD	7/24/97	-	4.5	2	12.5	8.63	9.87	6.74	33.2	0.02	75.8	-	435
Conkling Point	2997	SSJD	7/24/97	-	4.5	1	14	8.17	8.72	6.74	36.4	0.02	69.7	-	435
Conkling Point	3197	DBSS	8/5/97	-	4.1	15	0.3	9.57	24	8.18	41.5	0.03	112.2	-	329
Conkling Point	3197	DBSS	8/5/97	-	4.1	14	1.8	9.56	22.25	7.5	43.2	0.03	108.4	-	350
Conkling Point	3197	DBSS	8/5/97	-	4.1	13	2.7	9.49	22.04	7.46	42.3	0.03	107.2	-	350
Conkling Point	3197	DBSS	8/5/97	-	4.1	12	3.6	9.48	21.7	7.39	41.4	0.03	106.4	-	352
Conkling Point	3197	DBSS	8/5/97	-	4.1	11	4.7	9.88	21.04	7.33	43.5	0.03	109.5	-	352
Conkling Point	3197	DBSS	8/5/97	-	4.1	10	5.6	9.4	20.23	7.19	40.7	0.03	102.5	-	356
Conkling Point	3197	DBSS	8/5/97	-	4.1	9	6.7	9.32	19.21	7.13	39.5	0.03	99.6	-	356
Conkling Point	3197	DBSS	8/5/97	-	4.1	8	7.7	9.69	18.15	7.13	37.4	0.02	101.4	-	354
Conkling Point	3197	DBSS	8/5/97	-	4.1	7	8.7	10.04	17.18	7.09	36.3	0.02	103	-	353
Conkling Point	3197	DBSS	8/5/97	-	4.1	6	9.7	9.28	15.82	6.99	35.4	0.02	92.4	-	354
Conkling Point	3197	DBSS	8/5/97	-	4.1	5	10.7	8.73	14.39	6.93	34.7	0.02	84.3	-	354
Conkling Point	3197	DBSS	8/5/97	-	4.1	4	11.8	8.22	12.28	6.91	33.7	0.02	75.9	-	350
Conkling Point	3197	DBSS	8/5/97	-	4.1	3	12.6	8.21	11.23	6.93	34.5	0.02	73.8	-	346
Conkling Point	3197	DBSS	8/5/97	-	4.1	2	13.7	8	10.16	6.95	35.9	0.02	70.2	-	342
Conkling Point	3197	DBSS	8/5/97	-	4.1	1	14.8	7.22	9.44	7.02	38.4	0.02	62.2	-	388
Conkling Point	3297	DBSS	8/14/97	-	5	11	0.3	8.64	22.75	7.98	44.7	0.03	99.5	-	368
Conkling Point	3297	DBSS	8/14/97	-	5	10	2.1	8.73	22.56	8.11	44.7	0.03	100.3	-	361
Conkling Point	3297	DBSS	8/14/97	-	5	9	3.6	8.81	22.33	7.87	44.3	0.03	100.7	-	363
Conkling Point	3297	DBSS	8/14/97	-	5	8	5	8.57	21.86	7.31	45.2	0.03	97.1	-	384

Conkling Point	3297	DBSS	8/14/97	-	5	7	6.5	8.56	21.26	7.14	46.4	0.03	95.9	-	389
Conkling Point	3297	DBSS	8/14/97	-	5	6	8	8.56	20.65	7.06	43.6	0.03	94.7	-	391
Conkling Point	3297	DBSS	8/14/97	-	5	5	9.6	8.58	18.75	6.94	39	0.03	91.4	-	396
Conkling Point	3297	DBSS	8/14/97	-	5	4	11	7.69	15.02	6.9	35.7	0.02	75.8	-	399
Conkling Point	3297	DBSS	8/14/97	-	5	3	12.6	6.19	15.07	6.87	36.5	0.02	77	-	399
Conkling Point	3297	DBSS	8/14/97	-	5	2	14	6.57	9.2	6.95	39.1	0.03	56.7	-	401
Conkling Point	3297	DBSS	8/14/97	-	5	1	15.6	6.79	8.9	7.08	39.3	0.03	58.2	-	398
Conkling Point	3497	DBSS	8/27/97	-	7.2	11	0.4	9.02	21.92	7.53	50	0.03	102.3	-	346
Conkling Point	3497	DBSS	8/27/97	-	7.2	10	2	9.03	21.7	7.51	50	0.03	102.1	-	346
Conkling Point	3497	DBSS	8/27/97	-	7.2	9	3.6	9	21.56	7.45	50	0.03	101.6	-	347
Conkling Point	3497	DBSS	8/27/97	-	7.2	8	5	9.01	21.44	7.4	50.3	0.03	101.4	-	349
Conkling Point	3497	DBSS	8/27/97	-	7.2	7	6.6	8.84	21.14	7.33	49.2	0.03	98.9	-	350
Conkling Point	3497	DBSS	8/27/97	-	7.2	6	8	8.73	21	7.17	49.5	0.03	97.4	-	355
Conkling Point	3497	DBSS	8/27/97	-	7.2	5	9.5	8.19	20.49	6.96	49.5	0.03	90.5	-	363
Conkling Point	3497	DBSS	8/27/97	-	7.2	4	11	7.84	17.3	6.89	42.7	0.03	81.2	-	368
Conkling Point	3497	DBSS	8/27/97	-	7.2	3	12.6	8.37	15.61	6.88	40.2	0.03	83.6	-	368
Conkling Point	3497	DBSS	8/27/97	-	7.2	2	14.1	7.65	12.49	6.86	39.9	0.03	71.3	-	369
Conkling Point	3497	DBSS	8/27/97	-	7.2	1	15.8	6.43	9.48	6.87	42.8	0.03	56	-	369
Conkling Point	3797	ASRP	9/17/97	-	3	16	0.2	8.46	14.83	6.87	47.6	0.03	84.4	-	392
Conkling Point	3797	ASRP	9/17/97	-	3	15	1	8.42	14.86	6.86	47.6	0.03	84.1	-	392
Conkling Point	3797	ASRP	9/17/97	-	3	14	2	8.3	14.58	6.79	46.9	0.03	82.4	-	395
Conkling Point	3797	ASRP	9/17/97	-	3	13	3	7.76	13.75	6.68	45.7	0.03	76.9	-	399
Conkling Point	3797	ASRP	9/17/97	-	3	12	4	7.6	10.69	6.62	42.6	0.03	69.1	-	404
Conkling Point	3797	ASRP	9/17/97	-	3	11	5	7.76	9.81	6.62	42.7	0.03	69.1	-	404
Conkling Point	3797	ASRP	9/17/97	-	3	10	6	7.91	9.5	6.63	42.7	0.03	69.9	-	403
Conkling Point	3797	ASRP	9/17/97	-	3	9	7	7.78	9.43	6.63	43.1	0.03	68.6	-	402
Conkling Point	3797	ASRP	9/17/97	-	3	8	8	7.61	9.37	6.63	42.9	0.03	67.2	-	402
Conkling Point	3797	ASRP	9/17/97	-	3	7	9	7.5	9.06	6.62	43	0.03	65.7	-	401
Conkling Point	3797	ASRP	9/17/97	-	3	6	10	7.18	8.74	6.63	43.3	0.03	62.5	-	400
Conkling Point	3797	ASRP	9/17/97	-	3	5	11	7.35	8.68	6.66	43.4	0.03	63.7	-	398
Conkling Point	3797	ASRP	9/17/97	-	3	4	12	8.42	8.29	6.71	43.8	0.03	72.1	-	395
Conkling Point	3797	ASRP	9/17/97	-	3	3	13	8.59	8.2	6.74	43.8	0.03	74.2	-	392
Conkling Point	3797	ASRP	9/17/97	-	3	2	14.1	8.63	8.19	6.76	43.8	0.03	73.9	-	391
Conkling Point	3797	ASRP	9/17/97	-	3	1	15.2	8.7	8.19	6.79	43.8	0.03	74.5	-	389
Conkling Point	3997	ASRA	9/29/97	-	6.2	10	0.2	9.53	16.26	7.21	50.8	0.03	98.2	-	388
Conkling Point	3997	ASRA	9/29/97	-	6.2	9	1.5	9.3	15.79	7.13	50.3	0.03	94.8	-	391
Conkling Point	3997	ASRA	9/29/97	-	6.2	8	3	9.24	15.61	7.06	50.2	0.03	93.9	-	392
Conkling Point	3997	ASRA	9/29/97	-	6.2	7	4.5	8.78	14.69	6.94	48.9	0.03	87.4	-	395
Conkling Point	3997	ASRA	9/29/97	-	6.2	6	6	8.32	13.67	6.83	47.1	0.03	81	-	397
Conkling Point	3997	ASRA	9/29/97	-	6.2	5	7.5	7.78	12.38	6.77	44.3	0.03	73.6	-	399
Conkling Point	3997	ASRA	9/29/97	-	6.2	4	9	7.84	10.9	6.76	44	0.03	71.7	-	398

Conkling Point	3997	ASRA	9/29/97	-	6.2	3	10.5	7.38	9.64	6.77	42.2	0.03	65.1	-	397
Conkling Point	3997	ASRA	9/29/97	-	6.2	2	12	7.86	8.4	6.82	42.3	0.03	67.6	-	395
Conkling Point	3997	ASRA	9/29/97	-	6.2	1	13.4	8.18	8.22	6.92	42.4	0.03	70.1	-	389
Conkling Point	4297	DBAS	10/22/97	-	4.1	16	0.2	10.3	11.54	7.28	48	0.03	94	-	378
Conkling Point	4297	DBAS	10/22/97	-	4.1	15	1	10.28	11.56	7.31	49	0.03	93.9	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	14	2	10.27	11.57	7.29	49.1	0.03	93.8	-	377
Conkling Point	4297	DBAS	10/22/97	-	4.1	13	3	10.26	11.54	7.31	49.2	0.03	93.7	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	12	4	10.28	11.54	7.29	49.3	0.03	93.8	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	11	5	10.25	11.54	7.29	49.1	0.03	93.6	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	10	6	10.28	11.54	7.29	49.2	0.03	93.8	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	9	7	10.26	11.54	7.28	49.3	0.03	93.7	-	376
Conkling Point	4297	DBAS	10/22/97	-	4.1	8	8	10.25	11.54	7.29	49.3	0.03	93.6	-	375
Conkling Point	4297	DBAS	10/22/97	-	4.1	7	9	10.23	11.53	7.27	49.1	0.03	93.4	-	375
Conkling Point	4297	DBAS	10/22/97	-	4.1	6	10	10.24	11.53	7.27	49.1	0.03	93.5	-	375
Conkling Point	4297	DBAS	10/22/97	-	4.1	5	11	10.25	11.51	7.31	49.3	0.03	93.5	-	372
Conkling Point	4297	DBAS	10/22/97	-	4.1	4	12	10.26	11.5	7.3	49.3	0.03	93.4	-	372
Conkling Point	4297	DBAS	10/22/97	-	4.1	3	13	10.25	11.43	7.3	49.3	0.03	93.4	-	372
Conkling Point	4297	DBAS	10/22/97	-	4.1	2	14	10.63	11.15	7.31	49.5	0.03	96.2	-	371
Conkling Point	4297	DBAS	10/22/97	-	4.1	1	14.9	10.61	10.86	7.32	50	0.03	95.3	-	370
Conkling Point	4497	DBAS	11/3/97	-	3.1	11	0.3	10.59	7.04	9.79	53	0.03	93.2	*****	441
Conkling Point	4497	DBAS	11/3/97	-	3.1	10	1.5	10.54	7.05	9.74	53	0.03	92.5	*****	441
Conkling Point	4497	DBAS	11/3/97	-	3.1	9	3	10.52	7.02	9.6	53.1	0.03	92	*****	442
Conkling Point	4497	DBAS	11/3/97	-	3.1	8	4.5	10.75	6.99	9.24	52.9	0.03	93.3	*****	441
Conkling Point	4497	DBAS	11/3/97	-	3.1	7	6	10.97	6.93	8.74	53.7	0.03	94	*****	440
Conkling Point	4497	DBAS	11/3/97	-	3.1	6	7.5	9.25	6.79	8.48	52.9	0.03	78.8	*****	442
Conkling Point	4497	DBAS	11/3/97	-	3.1	5	9	9.27	6.77	8.48	52.8	0.03	78.9	*****	441
Conkling Point	4497	DBAS	11/3/97	-	3.1	4	10.5	9.32	6.75	8.43	52.5	0.03	79.3	*****	439
Conkling Point	4497	DBAS	11/3/97	-	3.1	3	12	8.81	6.66	7.73	48.8	0.03	73.7	*****	441
Conkling Point	4497	DBAS	11/3/97	-	3.1	2	13.6	8.64	6.66	7.41	47	0.03	71.6	*****	439
Conkling Point	4497	DBAS	11/3/97	-	3.1	1	14.9	8.65	6.71	7.37	46.7	0.03	71.7	*****	441

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Hidden Lake	1597	ASSS	4/18/97	-	1.9	5	0.2	12.49	6.73	7.46	38.6	0.02	*****	-	374
Hidden Lake	1597	ASSS	4/18/97	-	1.9	4	2.3	12.51	6.31	7.45	38.4	0.02	*****	-	375
Hidden Lake	1597	ASSS	4/18/97	-	1.9	3	3.7	12.54	6.28	7.45	38.4	0.02	*****	-	375
Hidden Lake	1597	ASSS	4/18/97	-	1.9	2	5.3	12.47	6.26	7.43	38.5	0.02	*****	-	375
Hidden Lake	1597	ASSS	4/18/97	-	1.9	1	6.9	12.38	6.23	7.42	38.3	0.02	99.9	-	375
Hidden Lake	1997	DBAC	5/16/97	-	0.7	11	0.2	11.1	11.97	7	29.9	0.02	102.2	-	371
Hidden Lake	1997	DBAC	5/16/97	-	0.7	10	1.4	11	10.64	6.97	28.7	0.02	98.1	-	376

Hidden Lake	1997	DBAC	5/16/97	-	0.7	9	2.4	11.06	9.38	6.97	28.8	0.02	95.8	-	377
Hidden Lake	1997	DBAC	5/16/97	-	0.7	8	3.4	11.03	9.3	6.97	29	0.02	95.3	-	377
Hidden Lake	1997	DBAC	5/16/97	-	0.7	7	4.5	11.03	9.27	6.96	29.3	0.02	95.3	-	377
Hidden Lake	1997	DBAC	5/16/97	-	0.7	6	5.4	11.01	9.25	6.98	29.4	0.02	95	-	375
Hidden Lake	1997	DBAC	5/16/97	-	0.7	5	6.4	10.95	9.17	6.96	30.2	0.02	94.4	-	376
Hidden Lake	1997	DBAC	5/16/97	-	0.7	4	7.5	10.89	9.1	6.98	29.1	0.02	93.6	-	375
Hidden Lake	1997	DBAC	5/16/97	-	0.7	3	8.5	10.87	9.07	6.98	28.8	0.02	93.4	-	374
Hidden Lake	1997	DBAC	5/16/97	-	0.7	2	9.3	10.86	9.04	6.99	28.9	0.02	93.3	-	373
Hidden Lake	1997	DBAC	5/16/97	-	0.7	1	10.4	10.86	8.97	6.99	30	0.02	93.1	-	373
Hidden Lake	2197	DBSS	5/29/97	-	1.7	10	0.7	10.91	12.61	6.99	26.6	0.02	101.9	-	361
Hidden Lake	2197	DBSS	5/29/97	-	1.7	9	1.8	11.25	9.84	7	26.9	0.02	98.6	-	361
Hidden Lake	2197	DBSS	5/29/97	-	1.7	8	2.8	11.18	9.53	6.99	26.7	0.02	97.3	-	361
Hidden Lake	2197	DBSS	5/29/97	-	1.7	7	3.7	11.14	9.3	6.97	26.6	0.02	96.5	-	362
Hidden Lake	2197	DBSS	5/29/97	-	1.7	6	4.7	11.13	9.19	6.95	26.6	0.02	96.1	-	362
Hidden Lake	2197	DBSS	5/29/97	-	1.7	5	5.7	11.03	9.12	6.95	26.4	0.02	95.3	-	361
Hidden Lake	2197	DBSS	5/29/97	-	1.7	4	6.8	10.74	8.45	6.92	26.4	0.02	91.1	-	361
Hidden Lake	2197	DBSS	5/29/97	-	1.7	3	7.7	10.76	8.38	6.92	26.3	0.02	91.1	-	360
Hidden Lake	2197	DBSS	5/29/97	-	1.7	2	8.8	10.62	8.33	6.91	26.5	0.02	89.8	-	359
Hidden Lake	2197	DBSS	5/29/97	-	1.7	1	9.8	10	8.3	6.91	27	0.02	84.5	-	367
Hidden Lake	2397	DBAS	6/11/97	-	2	10	0.5	11.03	13.17	7.09	29.3	0.02	104.9	-	405
Hidden Lake	2397	DBAS	6/11/97	-	2	9	1.6	11.24	12.28	7.11	29.1	0.02	104.7	-	405
Hidden Lake	2397	DBAS	6/11/97	-	2	8	2.6	11.15	11.98	7.1	29	0.02	103.2	-	405
Hidden Lake	2397	DBAS	6/11/97	-	2	7	3.6	11.13	11.91	7.06	29	0.02	102.9	-	407
Hidden Lake	2397	DBAS	6/11/97	-	2	6	4.3	11.1	10.59	7.02	28.5	0.02	99.5	-	409
Hidden Lake	2397	DBAS	6/11/97	-	2	5	5.3	10.97	10.02	7.01	28.2	0.02	97.1	-	410
Hidden Lake	2397	DBAS	6/11/97	-	2	4	6.3	10.96	9.61	6.99	27.7	0.02	96	-	410
Hidden Lake	2397	DBAS	6/11/97	-	2	3	7.2	10.72	9.35	6.98	27.7	0.02	93.3	-	411
Hidden Lake	2397	DBAS	6/11/97	-	2	2	8.1	10.16	9.13	6.98	28.1	0.02	88	-	411
Hidden Lake	2397	DBAS	6/11/97	-	2	1	8.2	10.15	9.12	6.98	28.1	0.02	87.8	-	411
Hidden Lake	2597	DBSS	6/26/97	-	2.4	11	0.4	10.75	13.72	7.16	30.6	0.02	103.3	-	406
Hidden Lake	2597	DBSS	6/26/97	-	2.4	10	0.3	10.75	13.77	7.15	30.6	0.02	103.5	-	406
Hidden Lake	2597	DBSS	6/26/97	-	2.4	9	1.2	10.78	13.3	7.14	30.4	0.02	102.7	-	409
Hidden Lake	2597	DBSS	6/26/97	-	2.4	8	2.4	10.8	12.94	7.13	30.5	0.02	102	-	409
Hidden Lake	2597	DBSS	6/26/97	-	2.4	7	3.4	10.75	12.74	7.11	30.2	0.02	101	-	410
Hidden Lake	2597	DBSS	6/26/97	-	2.4	6	4.5	10.52	12.44	7.06	30.3	0.02	98.3	-	411
Hidden Lake	2597	DBSS	6/26/97	-	2.4	5	4.5	10.54	12.36	7.02	30.3	0.02	98.3	-	411
Hidden Lake	2597	DBSS	6/26/97	-	2.4	4	5.5	10.38	11.89	6.98	30	0.02	95.8	-	411
Hidden Lake	2597	DBSS	6/26/97	-	2.4	3	6.5	7.98	11.15	6.83	29.8	0.02	72.3	-	416
Hidden Lake	2597	DBSS	6/26/97	-	2.4	2	7.5	6.41	10.43	6.86	30.3	0.02	57.2	-	418
Hidden Lake	2597	DBSS	6/26/97	-	2.4	1	7.4	6.45	10.38	6.88	30.3	0.02	57.4	-	419
Hidden Lake	2797	DBSS	7/8/97	-	2.4	12	0.3	10.08	18.56	7.14	34.7	0.02	*****	-	392

Hidden Lake	2797	DBSS	7/8/97	-	2.4	11	1.4	10.29	16.49	7.1	34.2	0.02	*****	-	395
Hidden Lake	2797	DBSS	7/8/97	-	2.4	10	2.1	10.45	16.29	7.08	34.2	0.02	*****	-	393
Hidden Lake	2797	DBSS	7/8/97	-	2.4	9	2.7	10.27	15.84	7.02	34.1	0.02	*****	-	394
Hidden Lake	2797	DBSS	7/8/97	-	2.4	8	3.4	10.49	15.25	6.98	33.8	0.02	*****	-	394
Hidden Lake	2797	DBSS	7/8/97	-	2.4	7	4.1	10.27	14.49	6.89	33.2	0.02	*****	-	396
Hidden Lake	2797	DBSS	7/8/97	-	2.4	6	4.8	9.94	13.4	6.84	32.4	0.02	94.5	-	396
Hidden Lake	2797	DBSS	7/8/97	-	2.4	5	5.4	9.42	13.18	6.77	32.6	0.02	89.2	-	396
Hidden Lake	2797	DBSS	7/8/97	-	2.4	4	6.1	8.57	12.67	6.72	32.4	0.02	80.2	-	395
Hidden Lake	2797	DBSS	7/8/97	-	2.4	3	6.9	7.84	12.2	6.7	32.5	0.02	72.4	-	392
Hidden Lake	2797	DBSS	7/8/97	-	2.4	2	7.6	6.94	11.93	6.7	32.6	0.02	63.7	-	388
Hidden Lake	2797	DBSS	7/8/97	-	2.4	1	8.3	6.46	11.82	6.82	32.8	0.02	59.3	-	375
Hidden Lake	2997	SSJD	7/24/97	-	3.5	10	0.5	9.66	22.27	7.88	35.2	0.02	*****	-	391
Hidden Lake	2997	SSJD	7/24/97	-	3.5	9	1	9.74	22.11	7.9	35.3	0.02	*****	-	390
Hidden Lake	2997	SSJD	7/24/97	-	3.5	8	1.5	9.8	21.99	7.82	35.2	0.02	*****	-	391
Hidden Lake	2997	SSJD	7/24/97	-	3.5	7	2.5	9.96	21.67	7.59	35.5	0.02	*****	-	395
Hidden Lake	2997	SSJD	7/24/97	-	3.5	6	3.5	10.45	17.59	7.02	32.7	0.02	*****	-	417
Hidden Lake	2997	SSJD	7/24/97	-	3.5	5	4.5	10	16.07	6.88	32	0.02	*****	-	421
Hidden Lake	2997	SSJD	7/24/97	-	3.5	4	5.4	8.64	14.36	6.67	31.6	0.02	84	-	425
Hidden Lake	2997	SSJD	7/24/97	-	3.5	3	6.5	6.29	13.18	6.61	33.2	0.02	59.8	-	427
Hidden Lake	2997	SSJD	7/24/97	-	3.5	2	7.3	5.5	12.9	6.65	33.7	0.02	51.8	-	424
Hidden Lake	2997	SSJD	7/24/97	-	3.5	1	8	4.83	12.77	6.82	34	0.02	45.4	-	432
Hidden Lake	3197	DBSS	8/5/97	-	5.1	10	0.3	10.19	25.4	8.67	38.8	0.02	122.5	-	256
Hidden Lake	3197	DBSS	8/5/97	-	5.1	9	1.5	10	24.66	8.44	38.2	0.02	118.5	-	258
Hidden Lake	3197	DBSS	8/5/97	-	5.1	8	2.5	10	24.16	8.19	38.2	0.02	117.4	-	258
Hidden Lake	3197	DBSS	8/5/97	-	5.1	7	3.5	10.08	21.44	7.21	35.1	0.02	112.5	-	289
Hidden Lake	3197	DBSS	8/5/97	-	5.1	6	4.5	10.33	18.29	7.05	32.4	0.02	108.5	-	293
Hidden Lake	3197	DBSS	8/5/97	-	5.1	5	5.5	8.93	16.04	6.89	32.7	0.02	89.4	-	284
Hidden Lake	3197	DBSS	8/5/97	-	5.1	4	6.6	5.91	14.49	6.83	36.5	0.02	57.1	-	269
Hidden Lake	3197	DBSS	8/5/97	-	5.1	3	7.5	2.2	13.35	6.85	40.1	0.03	20.7	-	237
Hidden Lake	3197	DBSS	8/5/97	-	5.1	2	8.5	0.44	12.85	7.02	52.9	0.03	4.1	-	178
Hidden Lake	3197	DBSS	8/5/97	-	5.1	1	8.5	0.48	12.82	7.09	52.2	0.03	4.5	-	174
Hidden Lake	3297	DBSS	8/14/97	-	6	10	0.3	8.76	23.28	7.95	39.9	0.03	101.9	-	275
Hidden Lake	3297	DBSS	8/14/97	-	6	9	1	8.77	23.22	7.89	39.8	0.03	101.9	-	271
Hidden Lake	3297	DBSS	8/14/97	-	6	8	2	8.82	22.95	7.8	39.9	0.03	102.1	-	269
Hidden Lake	3297	DBSS	8/14/97	-	6	7	3	8.91	22.74	7.54	40.3	0.03	102.6	-	271
Hidden Lake	3297	DBSS	8/14/97	-	6	6	4	8.64	21.72	6.98	38.8	0.02	97.6	-	290
Hidden Lake	3297	DBSS	8/14/97	-	6	5	5	8.67	18.32	6.76	34.5	0.02	91.6	-	296
Hidden Lake	3297	DBSS	8/14/97	-	6	4	6	6.25	16.11	6.67	37.6	0.02	63	-	288
Hidden Lake	3297	DBSS	8/14/97	-	6	3	6.9	2.37	14.47	6.6	41.7	0.03	22.7	-	266
Hidden Lake	3297	DBSS	8/14/97	-	6	2	8	0.46	13.43	6.59	50.7	0.03	4.4	-	242
Hidden Lake	3297	DBSS	8/14/97	-	6	1	8	0.81	13.86	6.92	47.1	0.03	8.1	-	225

Hidden Lake	3497	DBSS	8/27/97	-	5.7	10	0.5	9.39	22.02	7.9	44.9	0.03	106.8	-	235
Hidden Lake	3497	DBSS	8/27/97	-	5.7	9	0.3	9.39	22.02	7.9	44.9	0.03	106.8	-	235
Hidden Lake	3497	DBSS	8/27/97	-	5.7	8	1.6	9.41	21.92	7.88	45	0.03	106.9	-	231
Hidden Lake	3497	DBSS	8/27/97	-	5.7	7	2.4	9.43	21.88	7.83	45	0.03	107	-	223
Hidden Lake	3497	DBSS	8/27/97	-	5.7	6	3.5	9.45	21.85	7.74	45.1	0.03	107.2	-	219
Hidden Lake	3497	DBSS	8/27/97	-	5.7	5	4.6	9.33	21.58	7.44	44.9	0.03	105.3	-	218
Hidden Lake	3497	DBSS	8/27/97	-	5.7	4	5.4	10.33	19.92	7.05	42.8	0.03	112.9	-	228
Hidden Lake	3497	DBSS	8/27/97	-	5.7	3	6.5	3.7	17.44	6.73	47.1	0.03	38.4	-	208
Hidden Lake	3497	DBSS	8/27/97	-	5.7	2	7.5	0.3	14.92	6.67	57.7	0.04	2.9	-	147
Hidden Lake	3497	DBSS	8/27/97	-	5.7	1	8.4	0.4	13.88	6.6	79.9	0.05	3.9	-	139
Hidden Lake	3797	DBAS	9/16/97	-	2.5	9	0.2	8.74	18.01	7.31	47.1	0.03	92.1	-	296
Hidden Lake	3797	DBAS	9/16/97	-	2.5	8	1.2	8.75	18	7.3	47.2	0.03	92.3	-	295
Hidden Lake	3797	DBAS	9/16/97	-	2.5	7	2.2	8.68	17.9	7.27	47.1	0.03	91.3	-	294
Hidden Lake	3797	DBAS	9/16/97	-	2.5	6	3.2	8.57	17.84	7.27	47.1	0.03	90	-	290
Hidden Lake	3797	DBAS	9/16/97	-	2.5	5	4.2	8.63	17.79	7.27	47.1	0.03	90.4	-	286
Hidden Lake	3797	DBAS	9/16/97	-	2.5	4	5.2	8.75	17.73	7.24	47.1	0.03	91.7	-	281
Hidden Lake	3797	DBAS	9/16/97	-	2.5	3	6.2	8	17.44	7.12	49.2	0.03	83.4	-	278
Hidden Lake	3797	DBAS	9/16/97	-	2.5	2	7.2	7.77	17.12	7.07	50.9	0.03	80.4	-	264
Hidden Lake	3797	DBAS	9/16/97	-	2.5	1	8.2	7.96	17.05	7.05	51	0.03	82.3	-	245
Hidden Lake	3997	ASRA	9/29/97	-	3.5	10	0.2	9.65	17.34	7.45	48.2	0.03	101.6	-	350
Hidden Lake	3997	ASRA	9/29/97	-	3.5	9	1.6	9.68	16.21	7.44	48.1	0.03	99.6	-	349
Hidden Lake	3997	ASRA	9/29/97	-	3.5	8	2.4	9.67	15.91	7.44	48.2	0.03	98.8	-	348
Hidden Lake	3997	ASRA	9/29/97	-	3.5	7	3.2	9.61	15.86	7.42	48.2	0.03	98.1	-	347
Hidden Lake	3997	ASRA	9/29/97	-	3.5	6	4	9.5	15.82	7.4	48.2	0.03	97.1	-	346
Hidden Lake	3997	ASRA	9/29/97	-	3.5	5	4.7	9.4	15.77	7.37	48.3	0.03	95.7	-	344
Hidden Lake	3997	ASRA	9/29/97	-	3.5	4	5.6	9.36	15.67	7.34	48.1	0.03	95.2	-	340
Hidden Lake	3997	ASRA	9/29/97	-	3.5	3	6.4	8.83	15.47	7.33	48.7	0.03	89.4	-	333
Hidden Lake	3997	ASRA	9/29/97	-	3.5	2	7.2	9.16	15.34	7.35	48.9	0.03	92.4	-	328
Hidden Lake	3997	ASRA	9/29/97	-	3.5	1	8	9.44	15.32	7.36	48.6	0.03	95.2	-	319
Hidden Lake	4297	DBAS	10/20/97	-	2.5	9	0.3	10.76	11.63	7.44	54.2	0.03	97.8	-	350
Hidden Lake	4297	DBAS	10/20/97	-	2.5	8	1	10.76	11.43	7.46	54	0.03	97.5	-	349
Hidden Lake	4297	DBAS	10/20/97	-	2.5	7	2	10.76	11.25	7.42	54.2	0.03	97.1	-	351
Hidden Lake	4297	DBAS	10/20/97	-	2.5	6	3	10.64	11.12	7.39	54.3	0.03	95.7	-	351
Hidden Lake	4297	DBAS	10/20/97	-	2.5	5	4	10.71	11.05	7.38	54.1	0.03	96.2	-	350
Hidden Lake	4297	DBAS	10/20/97	-	2.5	4	5	10.72	11.02	7.37	54.2	0.03	96.2	-	349
Hidden Lake	4297	DBAS	10/20/97	-	2.5	3	6	10.75	11	7.31	54.3	0.03	96.5	-	351
Hidden Lake	4297	DBAS	10/20/97	-	2.5	2	7	10.77	11	7.28	54.2	0.03	96.6	-	351
Hidden Lake	4297	DBAS	10/20/97	-	2.5	1	8	10.89	10.86	7.25	54.3	0.03	97.4	-	350
Hidden Lake	4497	DBAS	11/3/97	-	2.4	9	0.2	11.64	7.48	8.83	53.2	0.03	100	*****	425
Hidden Lake	4497	DBAS	11/3/97	-	2.4	8	1	11.57	7.44	8.73	53.2	0.03	99.1	*****	427
Hidden Lake	4497	DBAS	11/3/97	-	2.4	7	2	11.5	7.44	8.65	53.1	0.03	98.3	*****	426

Hidden Lake	4497	DBAS	11/3/97	-	2.4	6	3	11.5	7.41	8.61	53.3	0.03	98.2	*****	425
Hidden Lake	4497	DBAS	11/3/97	-	2.4	5	4	11.48	7.43	8.61	53.2	0.03	98.1	*****	422
Hidden Lake	4497	DBAS	11/3/97	-	2.4	4	5	11.38	7.37	8.6	53.2	0.03	97.2	*****	423
Hidden Lake	4497	DBAS	11/3/97	-	2.4	3	6	11.17	7.36	8.45	53.5	0.03	95	*****	422
Hidden Lake	4497	DBAS	11/3/97	-	2.4	2	7	11.03	7.35	8.32	53.6	0.03	93.6	*****	422
Hidden Lake	4497	DBAS	11/3/97	-	2.4	1	7.8	11.02	7.36	8.32	53.7	0.03	93.3	*****	433

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Round Lake	1597	DBAC	5/16/97	-	0.4	12	0.2	11.03	10.79	7	26.7	0.02	99	-	372
Round Lake	1597	DBAC	5/16/97	-	0.4	11	0.2	11.11	10.63	7.03	27	0.02	99	-	372
Round Lake	1597	DBAC	5/16/97	-	0.4	10	0.2	11.09	10.63	7.05	27	0.02	98.9	-	371
Round Lake	1597	DBAC	5/16/97	-	0.4	9	1.7	11.09	10.33	7.04	26.9	0.02	98.3	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	8	1.7	11.06	10.35	7.03	26.8	0.02	98	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	7	1.7	11.07	10.36	7.02	26.9	0.02	98.2	-	374
Round Lake	1597	DBAC	5/16/97	-	0.4	6	2.8	11.15	8.61	7.06	26.5	0.02	94.7	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	5	2.8	11.13	8.6	7.06	26.5	0.02	94.5	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	4	2.8	11.1	8.59	7.06	26.5	0.02	94.2	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	3	3.9	11.17	8.33	7.06	26.4	0.02	94.3	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	2	3.9	11.2	8.32	7.06	26.3	0.02	94.5	-	373
Round Lake	1597	DBAC	5/16/97	-	0.4	1	3.9	11.24	8.3	7.06	26.6	0.02	94.8	-	373
Round Lake	2197	DBSS	5/29/97	-	1.4	12	0.3	11.02	10.86	7.11	26.5	0.02	99	-	365
Round Lake	2197	DBSS	5/29/97	-	1.4	11	0.3	11.03	10.92	7.1	26.4	0.02	99.3	-	366
Round Lake	2197	DBSS	5/29/97	-	1.4	10	0.2	11.01	11	7.1	26.2	0.02	99.3	-	366
Round Lake	2197	DBSS	5/29/97	-	1.4	9	1.2	11.39	9.71	7.11	26.6	0.02	99.7	-	366
Round Lake	2197	DBSS	5/29/97	-	1.4	8	1.2	11.37	9.69	7.13	26.7	0.02	99.4	-	366
Round Lake	2197	DBSS	5/29/97	-	1.4	7	1.2	11.35	9.73	7.12	26.7	0.02	99.4	-	366
Round Lake	2197	DBSS	5/29/97	-	1.4	6	2.4	11.44	9.5	7.09	26.7	0.02	99.5	-	368
Round Lake	2197	DBSS	5/29/97	-	1.4	5	2.4	11.44	9.51	7.1	26.3	0.02	99.4	-	368
Round Lake	2197	DBSS	5/29/97	-	1.4	4	2.4	11.5	9.45	7.1	26.7	0.02	99.8	-	367
Round Lake	2197	DBSS	5/29/97	-	1.4	3	3.3	11.53	9.2	7.09	26.7	0.02	99.6	-	368
Round Lake	2197	DBSS	5/29/97	-	1.4	2	3.3	11.54	9.22	7.08	26.4	0.02	99.7	-	369
Round Lake	2197	DBSS	5/29/97	-	1.4	1	3.3	11.54	9.23	7.09	26.4	0.02	99.8	-	368
Round Lake	2397	DBAS	6/11/97	-	1.8	10	0.3	10.67	13.47	7.14	29.4	0.02	102.1	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	9	0.3	10.65	13.45	7.15	29.6	0.02	101.9	-	397
Round Lake	2397	DBAS	6/11/97	-	1.8	8	0.3	10.67	13.45	7.15	29.5	0.02	102.1	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	7	1	11.08	11.69	7.19	29	0.02	101.9	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	6	1	11.02	11.81	7.19	29.1	0.02	101.6	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	5	1	10.99	12	7.19	29	0.02	101.8	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	4	0.9	10.85	12.21	7.19	29	0.02	100.9	-	398
Round Lake	2397	DBAS	6/11/97	-	1.8	3	1.5	11.29	11.28	7.21	28.6	0.02	102.8	-	401
Round Lake	2397	DBAS	6/11/97	-	1.8	2	1.5	11.25	11.38	7.22	28.7	0.02	102.7	-	400

Round Lake	2397	DBAS	6/11/97	-	1.8	1	1.6	11.27	11.43	7.21	28.6	0.02	103	-	401
Round Lake	2597	DBSS	6/26/97	-	1.5	10	0.3	11.34	11.69	7.21	32.4	0.02	104.1	-	398
Round Lake	2597	DBSS	6/26/97	-	1.5	9	0.3	11.37	11.7	7.21	31.9	0.02	104.3	-	398
Round Lake	2597	DBSS	6/26/97	-	1.5	8	0.3	11.26	11.95	7.2	32.1	0.02	104.2	-	399
Round Lake	2597	DBSS	6/26/97	-	1.5	7	0.9	11.34	11.21	7.18	32.1	0.02	103	-	401
Round Lake	2597	DBSS	6/26/97	-	1.5	6	0.9	11.25	11.23	7.19	32	0.02	102.2	-	400
Round Lake	2597	DBSS	6/26/97	-	1.5	5	1	11.3	11.02	7.2	31.9	0.02	102.2	-	401
Round Lake	2597	DBSS	6/26/97	-	1.5	4	1.4	11.28	10.98	7.19	31.7	0.02	101.9	-	401
Round Lake	2597	DBSS	6/26/97	-	1.5	3	1.4	11.32	10.92	7.2	31.9	0.02	102.1	-	402
Round Lake	2597	DBSS	6/26/97	-	1.5	2	1.5	11.31	10.95	7.2	31.9	0.02	102.1	-	402
Round Lake	2597	DBSS	6/26/97	-	1.5	1	1.6	11.32	10.95	7.19	31.8	0.02	102.1	-	403
Round Lake	2797	DBSS	7/8/97	-	0.6	2	0.2	9.73	16.76	7.33	35.3	0.02	99.6	-	399
Round Lake	2797	DBSS	7/8/97	-	0.6	1	0.6	10.33	16.11	7.36	35.1	0.02	*****	-	397
Round Lake	2997	SSJD	7/24/97	-	1.7	10	0.3	9.48	19.4	7.27	37.9	0.02	*****	-	405
Round Lake	2997	SSJD	7/24/97	-	1.7	9	0.3	9.47	19.26	7.26	37.9	0.02	*****	-	405
Round Lake	2997	SSJD	7/24/97	-	1.7	8	0.3	9.49	19.28	7.25	38	0.02	*****	-	406
Round Lake	2997	SSJD	7/24/97	-	1.7	7	0.9	9.37	18.66	7.25	37.8	0.02	99.8	-	408
Round Lake	2997	SSJD	7/24/97	-	1.7	6	0.9	9.31	18.63	7.26	37.8	0.02	99	-	408
Round Lake	2997	SSJD	7/24/97	-	1.7	5	0.9	9.36	18.66	7.25	37.8	0.02	99.6	-	408
Round Lake	2997	SSJD	7/24/97	-	1.7	4	0.9	9.37	18.7	7.25	37.9	0.02	99.6	-	408
Round Lake	2997	SSJD	7/24/97	-	1.7	3	1.7	9.47	18.51	7.32	37.8	0.02	*****	-	406
Round Lake	2997	SSJD	7/24/97	-	1.7	2	1.7	9.48	18.51	7.34	37.9	0.02	*****	-	408
Round Lake	2997	SSJD	7/24/97	-	1.7	1	1.7	9.56	18.51	7.38	37.9	0.02	*****	-	411
Round Lake	3197	DBSS	8/5/97	-	1.7	2	0.3	9.22	22.77	7.55	44.2	0.03	105.6	-	334
Round Lake	3197	DBSS	8/5/97	-	1.7	1	1.5	9.56	21.9	7.68	44.2	0.03	107.6	-	329
Round Lake	3297	DBSS	8/14/97	-	1.4	2	0.3	9.3	23.91	7.92	48.7	0.03	109.5	-	292
Round Lake	3297	DBSS	8/14/97	-	1.4	1	1.3	9.75	23.42	8.12	49.1	0.03	113.8	-	280
Round Lake	3497	DBSS	8/27/97	-	2.1	3	0.3	9.01	21.21	7.35	55.7	0.04	100.9	-	294
Round Lake	3497	DBSS	8/27/97	-	2.1	2	1	8.93	20.84	7.35	55.5	0.04	99.5	-	292
Round Lake	3497	DBSS	8/27/97	-	2.1	1	1.9	9.11	20.72	7.38	55.6	0.04	101.1	-	287
Round Lake	3797	DBAS	9/16/97	-	1.3	2	0.2	8.62	17.39	7.29	55.6	0.04	89.7	-	286
Round Lake	3797	DBAS	9/16/97	-	1.3	1	1	8.87	17.39	7.31	55.5	0.04	92.2	-	285
Round Lake	3997	ASRA	9/29/97	-	1.5	8	0.3	11.35	15.24	7.44	51.9	0.03	114.5	-	377
Round Lake	3997	ASRA	9/29/97	-	1.5	7	0.3	11.35	15.25	7.45	51.9	0.03	114.3	-	376
Round Lake	3997	ASRA	9/29/97	-	1.5	6	0.3	11.37	15.27	7.45	51.9	0.03	114.6	-	376
Round Lake	3997	ASRA	9/29/97	-	1.5	5	0.3	11.36	15.29	7.46	51.9	0.03	114.6	-	376

Round Lake	3997	ASRA	9/29/97	-	1.5	4	1.5	11.38	14.79	7.49	51.9	0.03	113.5	-	375
Round Lake	3997	ASRA	9/29/97	-	1.5	3	1.5	11.28	14.69	7.5	52.1	0.03	112.3	-	374
Round Lake	3997	ASRA	9/29/97	-	1.5	2	1.5	10.91	14.71	7.5	51.9	0.03	108.6	-	374
Round Lake	3997	ASRA	9/29/97	-	1.5	1	1.5	11.51	14.67	7.51	51.9	0.03	115.9	-	373
Round Lake	4297	DBAS	10/20/97	-	1.2	3	0.3	10.65	9.38	6.97	57.2	0.04	91.9	-	381
Round Lake	4297	DBAS	10/20/97	-	1.2	2	0.8	10.68	9.35	6.96	57.1	0.04	92.2	-	382
Round Lake	4297	DBAS	10/20/97	-	1.2	1	1.3	10.87	9.19	6.93	57.1	0.04	93.4	-	384
Round Lake	4497	DBAS	11/3/97	-	1	2	0.3	11.93	7.13	6.68	38.7	0.02	97.1	*****	429
Round Lake	4497	DBAS	11/3/97	-	1	1	1.2	11.99	7.11	6.68	38.5	0.02	97.6	*****	431

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Chatcolet Lake DP	1597	ASSS	4/18/97	-	1.5	3	0.5	12.66	6.96	7.41	38.3	0.02	*****	-	380
Chatcolet Lake DP	1597	ASSS	4/18/97	-	1.5	2	5.4	12.37	5.98	7.41	36.3	0.02	99.3	-	381
Chatcolet Lake DP	1597	ASSS	4/18/97	-	1.5	1	10.4	12.45	5.7	7.41	33.5	0.02	99	-	381
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	14	0.2	11.31	14.46	7.12	33.7	0.02	110	-	368
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	13	0.8	11.32	13.83	7.08	33.3	0.02	108.6	-	371
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	12	1.8	11.46	12.2	7.03	32.6	0.02	106.3	-	373
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	11	2.7	11.37	11.66	7.01	32	0.02	103.9	-	374
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	10	3.7	11	10.94	6.95	30.5	0.02	98.7	-	376
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	9	4.7	10.91	9.76	6.93	28.8	0.02	95.4	-	378
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	8	5.6	10.84	9.3	6.9	10.84	****	5.6	-	376
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	7	6.7	10.87	9.09	6.95	27.9	0.02	93.4	-	376
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	6	7.7	10.88	9.02	6.95	27.9	0.02	93.4	-	376
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	5	8.7	10.89	8.6	6.94	30.2	0.02	92.5	-	377
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	4	9.7	10.86	8.5	6.94	30.3	0.02	92.1	-	377
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	3	10.6	10.75	8.32	6.94	31	0.02	90.7	-	376
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	2	11.6	10.03	7.54	6.92	35.2	0.02	83.2	-	378
Chatcolet Lake DP	1997	DBSS	5/16/97	-	1.4	1	12.7	10.04	7.48	6.92	35.4	0.02	83	-	377
Chatcolet Lake DP	2197	DBSS	5/29/97	-	1.6	11	0.3	10.62	13.44	6.98	27.4	0.02	101.2	-	360
Chatcolet Lake DP	2197	DBSS	5/29/97	-	1.6	10	2.3	10.9	9.6	6.97	26.8	0.02	95	-	363
Chatcolet Lake DP	2197	DBSS	5/29/97	-	1.6	9	3.4	10.8	8.6	6.98	26.7	0.02	91.9	-	362
Chatcolet Lake DP	2197	DBSS	5/29/97	-	1.6	8	4.5	10.85	8.55	6.96	26.6	0.02	92.2	-	363
Chatcolet Lake DP	2197	DBSS	5/29/97	-	1.6	7	6.5	10.88	8.35	6.96	26.5	0.02	92.1	-	362
Chatcolet Lake DP	2197	DBSS	5/29/97	-	1.6	6	7.4	10.88	8.29	6.95	26.4	0.02	91.9	-	362
Chatcolet Lake DP	2197	DBSS	5/29/97	-	1.6	5	8.4	11.07	8.11	6.95	26.5	0.02	93.1	-	361
Chatcolet Lake DP	2197	DBSS	5/29/97	-	1.6	4	9.3	11.05	7.88	6.95	26.4	0.02	92.4	-	360
Chatcolet Lake DP	2197	DBSS	5/29/97	-	1.6	3	10.4	11.03	7.86	6.93	26.4	0.02	92.2	-	360
Chatcolet Lake DP	2197	DBSS	5/29/97	-	1.6	2	11.4	11	7.78	6.92	26.4	0.02	91.8	-	359

Chatcolet Lake DP	2197	DBSS	5/29/97	-	1.6	1	12.3	10.3	7.73	6.91	27.3	0.02	85.8	-	359
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	12	0.1	11.24	12.99	7.2	29.1	0.02	106.4	-	417
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	11	1	11.23	11.66	7.23	28.3	0.02	103.2	-	417
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	10	1.9	11.08	10.38	7.21	27.5	0.02	98.8	-	419
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	9	3	11.09	10	7.19	27.5	0.02	98	-	421
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	8	3.9	11.16	9.82	7.19	27.2	0.02	98.1	-	421
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	7	4.9	11.2	9.72	7.19	27.1	0.02	98.2	-	421
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	6	6	11.07	9.67	7.2	27.1	0.02	97	-	421
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	5	7	11.15	9.15	7.21	26.9	0.02	96.5	-	421
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	4	8	11.07	9.02	7.21	27	0.02	95.5	-	421
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	3	8.9	10.94	8.99	7.23	27.1	0.02	94.3	-	421
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	2	9.8	10.84	9.04	7.26	27.3	0.02	93.5	-	419
Chatcolet Lake DP	2397	DBAS	6/13/97	-	2.1	1	10.9	10.85	8.99	7.29	27.3	0.02	93.4	-	417
Chatcolet Lake DP	2597	DBSS	6/26/97	-	2.5	11	0.3	10.94	14.59	7.21	31.5	0.02	107.3	-	373
Chatcolet Lake DP	2597	DBSS	6/26/97	-	2.5	10	1.4	10.94	14.45	7.17	31.5	0.02	106.9	-	375
Chatcolet Lake DP	2597	DBSS	6/26/97	-	2.5	9	2.5	11.03	13.45	7.17	31.5	0.02	105.5	-	375
Chatcolet Lake DP	2597	DBSS	6/26/97	-	2.5	8	3.6	10.97	13.25	7.15	31.4	0.02	104.4	-	375
Chatcolet Lake DP	2597	DBSS	6/26/97	-	2.5	7	4.6	10.99	12.95	7.12	31.2	0.02	103.8	-	375
Chatcolet Lake DP	2597	DBSS	6/26/97	-	2.5	6	5.6	10.93	12.74	7.09	31.5	0.02	102.8	-	374
Chatcolet Lake DP	2597	DBSS	6/26/97	-	2.5	5	6.6	10.97	12.1	7.04	31.6	0.02	101.8	-	375
Chatcolet Lake DP	2597	DBSS	6/26/97	-	2.5	4	7.7	10.35	10.92	7	30.9	0.02	93.4	-	375
Chatcolet Lake DP	2597	DBSS	6/26/97	-	2.5	3	8.7	9.68	10.68	6.98	30.2	0.02	86.8	-	374
Chatcolet Lake DP	2597	DBSS	6/26/97	-	2.5	2	9.7	9.38	10.12	6.99	30.4	0.02	83	-	372
Chatcolet Lake DP	2597	DBSS	6/26/97	-	2.5	1	10.6	9.44	10.1	7.02	30.6	0.02	83.5	-	370
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	12	0.3	10.25	17.45	7.19	35.2	0.02	*****	-	411
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	11	0.9	10.23	17.39	7.17	35.2	0.02	*****	-	411
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	10	2.1	10.2	17.17	7.11	35.1	0.02	*****	-	413
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	9	3.1	9.99	16.11	7.05	35.1	0.02	*****	-	416
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	8	4	9.88	15.35	7.02	34.9	0.02	98.1	-	417
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	7	5	9.83	14.71	6.97	33.8	0.02	96.2	-	418
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	6	6	9.84	13.13	6.94	33.3	0.02	93	-	420
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	5	7	9.5	12.69	6.91	33.1	0.02	88.9	-	421
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	4	8.1	8.93	12.39	6.89	33.3	0.02	83	-	421
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	3	9	9.12	12.25	6.89	33.2	0.02	84.5	-	421
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	2	10.1	8.4	11.77	6.9	33.3	0.02	77	-	418
Chatcolet Lake DP	2797	DBSS	7/8/97	-	1.8	1	11	8.23	11.64	7	33.7	0.02	75.2	-	423
Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	12	0.6	9.86	22.15	7.99	36.4	0.02	*****	-	378
Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	11	1.8	9.85	22.15	7.96	36.4	0.02	*****	-	378
Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	10	2.9	9.97	21.67	7.85	36.8	0.02	*****	-	379
Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	9	3.9	9.81	19.33	7.18	35.8	0.02	*****	-	402

Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	8	4.9	10.24	16.32	7.08	33.2	0.02	*****	-	406
Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	7	5.9	9.79	14.49	6.93	32.4	0.02	95.4	-	410
Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	6	6.9	8.29	13.58	6.84	32.1	0.02	79.2	-	413
Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	5	7.9	7.71	13.1	6.82	32.2	0.02	72.9	-	413
Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	4	8.9	6.88	12.72	6.82	32.4	0.02	64.5	-	411
Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	3	10	5.03	12.03	6.87	34.1	0.02	46.5	-	408
Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	2	10.9	5.19	12.08	6.97	34.1	0.02	47.9	-	402
Chatcolet Lake DP	2997	SSJD	7/24/97	-	3.7	1	0	0	0	0	0	0	0	-	0
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	13	0.3	11.59	24.51	9.28	42.3	0.03	137.1	-	289
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	12	1.7	11.55	24.37	9.22	42.2	0.03	136.3	-	290
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	11	2.7	10.64	23.4	8.86	40.4	0.03	123.3	-	299
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	10	3.6	10.13	22.02	7.49	39.2	0.03	114.4	-	331
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	9	4.6	9.8	18.9	7.05	35.8	0.02	104.2	-	349
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	8	5.6	9.77	16.32	6.97	33	0.02	98.4	-	351
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	7	6.5	8.09	14.44	6.84	33	0.02	78.2	-	353
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	6	7.5	6.42	13.55	6.79	33.4	0.02	60.9	-	353
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	5	8.4	5.49	13.15	6.79	33.6	0.02	51.6	-	351
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	4	9.5	3.45	12.3	6.81	36.1	0.02	31.8	-	347
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	3	10.5	3.05	12.11	6.89	36.7	0.02	28	-	342
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	2	11.5	2.57	12.07	7.03	38.4	0.02	23.5	-	335
Chatcolet Lake DP	3197	DBSS	8/5/97	-	3	1	12.4	2.5	12.13	7.18	39.3	0.03	23	-	343
Chatcolet Lake DP	3297	DBSS	8/13/97	-	3.5	10	0.8	9.41	22.99	8.77	42.9	0.03	108.9	-	339
Chatcolet Lake DP	3297	DBSS	8/13/97	-	3.5	9	1.8	9.41	22.58	8.71	42.7	0.03	108.2	-	341
Chatcolet Lake DP	3297	DBSS	8/13/97	-	3.5	8	2.8	9.27	21.79	8.4	42	0.03	104.7	-	348
Chatcolet Lake DP	3297	DBSS	8/13/97	-	3.5	7	3.8	8.8	21	7.58	39.8	0.03	98	-	371
Chatcolet Lake DP	3297	DBSS	8/13/97	-	3.5	6	4.8	8.7	20.35	7.29	39.1	0.03	95.7	-	379
Chatcolet Lake DP	3297	DBSS	8/13/97	-	3.5	5	5.8	8.91	18.18	6.95	35.4	0.02	93.9	-	392
Chatcolet Lake DP	3297	DBSS	8/13/97	-	3.5	4	6.8	6.33	15.19	6.8	34.4	0.02	62.6	-	399
Chatcolet Lake DP	3297	DBSS	8/13/97	-	3.5	3	7.9	5.85	14.18	6.8	34.9	0.02	56.6	-	399
Chatcolet Lake DP	3297	DBSS	8/13/97	-	3.5	2	8.8	4.53	13.48	6.82	35.8	0.02	43.2	-	399
Chatcolet Lake DP	3297	DBSS	8/13/97	-	3.5	1	9.8	2.8	13.1	6.87	39.2	0.03	26.5	-	398
Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	12	0.4	9.51	21.99	8.48	47.3	0.03	108.2	-	271
Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	11	0.7	9.54	21.97	8.49	47.4	0.03	108.4	-	267
Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	10	1.7	9.55	21.93	8.47	47.4	0.03	108.5	-	267
Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	9	2.7	9.52	21.65	8.38	47.3	0.03	107.5	-	267
Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	8	3.7	9.54	21.51	8.34	48.8	0.03	107.5	-	265
Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	7	4.7	9.29	21.19	7.74	45.6	0.03	104.1	-	276
Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	6	5.7	8.58	20.37	7.14	44.4	0.03	94.7	-	297
Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	5	6.7	5.59	17.27	6.77	40.6	0.03	57.9	-	313
Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	4	7.7	4.07	16.17	6.73	40.6	0.03	41.1	-	311
Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	3	8.8	1.34	13.79	6.75	42.7	0.03	12.9	-	305

Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	2	9.8	0.64	13.33	6.84	46.9	0.03	6.1	-	296
Chatcolet Lake DP	3497	DBSS	8/27/97	-	4.4	1	10.7	0.52	13.09	6.98	49	0.03	4.9	-	284
Chatcolet Lake DP	3797	DBAS	9/16/97	-	2.2	11	0.3	9.12	17.71	7.49	46.4	0.03	95.6	-	251
Chatcolet Lake DP	3797	DBAS	9/16/97	-	2.2	10	1.7	9.11	17.71	7.48	46.4	0.03	95.4	-	248
Chatcolet Lake DP	3797	DBAS	9/16/97	-	2.2	9	2.7	9.05	17.69	7.45	46.4	0.03	94.8	-	246
Chatcolet Lake DP	3797	DBAS	9/16/97	-	2.2	8	3.7	9.02	17.67	7.42	46.4	0.03	94.4	-	244
Chatcolet Lake DP	3797	DBAS	9/16/97	-	2.2	7	4.7	8.93	17.66	7.39	46.3	0.03	93.5	-	241
Chatcolet Lake DP	3797	DBAS	9/16/97	-	2.2	6	5.7	9.01	17.56	7.31	46.1	0.03	93.8	-	231
Chatcolet Lake DP	3797	DBAS	9/16/97	-	2.2	5	6.7	8.67	17.49	7.23	45.9	0.03	90.4	-	219
Chatcolet Lake DP	3797	DBAS	9/16/97	-	2.2	4	7.7	8.58	17.49	7.15	45.8	0.03	89.5	-	205
Chatcolet Lake DP	3797	DBAS	9/16/97	-	2.2	3	8.7	2.12	16.21	6.79	46.4	0.03	21	-	156
Chatcolet Lake DP	3797	DBAS	9/16/97	-	2.2	2	9.7	0.27	12.49	6.72	74.3	0.05	2.4	-	34
Chatcolet Lake DP	3797	DBAS	9/16/97	-	2.2	1	10.7	0.35	12.36	6.69	77.1	0.05	3.3	-	42
Chatcolet Lake DP	3997	ASRA	9/29/97	-	3.3	11	0.6	9.55	16.12	7.43	48.5	0.03	98	-	362
Chatcolet Lake DP	3997	ASRA	9/29/97	-	3.3	10	1.6	9.51	15.72	7.41	48.3	0.03	96.8	-	362
Chatcolet Lake DP	3997	ASRA	9/29/97	-	3.3	9	2.6	9.25	15.67	7.37	48.3	0.03	94.1	-	363
Chatcolet Lake DP	3997	ASRA	9/29/97	-	3.3	8	3.6	9.15	15.54	7.35	48.4	0.03	92.8	-	362
Chatcolet Lake DP	3997	ASRA	9/29/97	-	3.3	7	4.6	8.95	15.47	7.31	48.4	0.03	90.7	-	362
Chatcolet Lake DP	3997	ASRA	9/29/97	-	3.3	6	5.6	8.67	15.37	7.3	48.7	0.03	87.6	-	362
Chatcolet Lake DP	3997	ASRA	9/29/97	-	3.3	5	6.6	8.63	15.32	7.3	48.7	0.03	87.1	-	361
Chatcolet Lake DP	3997	ASRA	9/29/97	-	3.3	4	7.6	8.53	15.27	7.3	48.8	0.03	86.2	-	359
Chatcolet Lake DP	3997	ASRA	9/29/97	-	3.3	3	8.6	8.41	15.22	7.3	48.9	0.03	84.7	-	358
Chatcolet Lake DP	3997	ASRA	9/29/97	-	3.3	2	9.6	8.06	15.06	7.29	49.4	0.03	80.8	-	356
Chatcolet Lake DP	3997	ASRA	9/29/97	-	3.3	1	10.6	7.99	14.99	7.32	50.4	0.03	80	-	353
Chatcolet Lake DP	4297	DBAS	10/20/97	-	2.8	11	0.3	11.17	11.63	7.54	54.9	0.04	101.7	-	372
Chatcolet Lake DP	4297	DBAS	10/20/97	-	2.8	10	1	11.1	11.56	7.5	55	0.04	100.9	-	373
Chatcolet Lake DP	4297	DBAS	10/20/97	-	2.8	9	2	11.08	11.25	7.5	54.7	0.04	100	-	373
Chatcolet Lake DP	4297	DBAS	10/20/97	-	2.8	8	3	11.05	11.23	7.45	54.9	0.04	99.6	-	375
Chatcolet Lake DP	4297	DBAS	10/20/97	-	2.8	7	4	10.97	11.17	7.4	54.6	0.03	98.8	-	376
Chatcolet Lake DP	4297	DBAS	10/20/97	-	2.8	6	5	10.89	11.13	7.32	54.5	0.03	98	-	378
Chatcolet Lake DP	4297	DBAS	10/20/97	-	2.8	5	6	10.81	11.07	7.24	54.5	0.03	97.1	-	381
Chatcolet Lake DP	4297	DBAS	10/20/97	-	2.8	4	7	10.67	11.04	7.15	54.6	0.03	95.8	-	384
Chatcolet Lake DP	4297	DBAS	10/20/97	-	2.8	3	8	10.53	11	7.08	54.6	0.03	94.5	-	386
Chatcolet Lake DP	4297	DBAS	10/20/97	-	2.8	2	9	9.17	10.74	6.92	56.4	0.04	81.8	-	392
Chatcolet Lake DP	4297	DBAS	10/20/97	-	2.8	1	10	8.97	10.64	6.88	56.8	0.04	79.8	-	393
Chatcolet Lake DP	4497	DBAS	11/3/97	-	2	11	0.2	11.7	7.53	8.55	53.1	0.03	99.8	*****	418
Chatcolet Lake DP	4497	DBAS	11/3/97	-	2	10	1	11.7	7.5	8.55	53.3	0.03	99.8	*****	419
Chatcolet Lake DP	4497	DBAS	11/3/97	-	2	9	2	11.69	7.45	8.5	53.2	0.03	99.5	*****	421
Chatcolet Lake DP	4497	DBAS	11/3/97	-	2	8	3	11.69	7.43	8.4	53.2	0.03	99.3	*****	419
Chatcolet Lake DP	4497	DBAS	11/3/97	-	2	7	4	11.69	7.39	8.38	53.1	0.03	99.3	*****	420

Chatcolet Lake DP	4497	DBAS	11/3/97	-	2	6	5	11.7	7.38	8.37	53.1	0.03	99.4	*****	417
Chatcolet Lake DP	4497	DBAS	11/3/97	-	2	5	6	11.72	7.37	8.33	53.1	0.03	99.4	*****	416
Chatcolet Lake DP	4497	DBAS	11/3/97	-	2	4	7	11.77	7.31	8.19	52.5	0.03	99.5	*****	417
Chatcolet Lake DP	4497	DBAS	11/3/97	-	2	3	8	11.73	7.29	7.97	52	0.03	98.6	*****	416
Chatcolet Lake DP	4497	DBAS	11/3/97	-	2	2	9	11.46	7.25	7.55	52.2	0.03	95.4	*****	415
Chatcolet Lake DP	4497	DBAS	11/3/97	-	2	1	9.8	11.55	7.26	6.91	47.7	0.03	94.6	*****	414

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Chatcolet Lake SH	1597	ASSS	4/18/97	-	0.5	2	0.2	12.75	5.46	7.43	32.4	0.02	*****	-	325
Chatcolet Lake SH	1597	ASSS	4/18/97	-	0.5	1	0.7	13.38	5.47	7.41	32.6	0.02	*****	-	320
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	13	0.3	11.04	10.48	6.99	27.2	0.02	98.1	-	369
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	12	0.3	11.05	10.49	7	27.2	0.02	98.2	-	369
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	11	0.3	11.04	10.44	7.01	27.3	0.02	98	-	369
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	10	0.3	11.03	10.46	7.01	27.2	0.02	98	-	369
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	9	1.3	11.02	9.97	6.97	27	0.02	95.7	-	374
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	8	1.3	11	9.89	6.96	27.1	0.02	96.4	-	374
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	7	1.3	11.01	9.51	6.99	27	0.02	95.6	-	373
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	6	1.3	10.97	10.15	6.95	27.4	0.02	96.7	-	375
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	5	3.1	11.21	8.56	7	26.4	0.02	95.1	-	375
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	4	3.1	11.21	8.58	6.99	26.3	0.02	95.2	-	375
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	3	3.1	11.22	8.55	6.99	26.3	0.02	95.2	-	376
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	2	3.1	11.22	8.59	7	26.3	0.02	95.3	-	375
Chatcolet Lake SH	1997	DBSS	5/16/97	-	0.3	1	3.1	11.21	8.56	7.01	26.4	0.02	95.1	-	375
Chatcolet Lake SH	2197	DBSS	5/29/97	-	1.6	10	0.2	10.8	11.38	7.04	26.8	0.02	98.2	-	368
Chatcolet Lake SH	2197	DBSS	5/29/97	-	1.6	9	0.2	10.85	11.72	7.1	18.3	0.01	99.5	-	363
Chatcolet Lake SH	2197	DBSS	5/29/97	-	1.6	8	0.2	10.87	11.59	7.1	15.3	0.01	99.3	-	364
Chatcolet Lake SH	2197	DBSS	5/29/97	-	1.6	7	1.4	11.32	9.74	7.07	26.7	0.02	99	-	368
Chatcolet Lake SH	2197	DBSS	5/29/97	-	1.6	6	1.4	11.32	9.69	7.07	26.7	0.02	99.1	-	368
Chatcolet Lake SH	2197	DBSS	5/29/97	-	1.6	5	1.4	11.35	9.68	7.08	26.6	0.02	99.4	-	368
Chatcolet Lake SH	2197	DBSS	5/29/97	-	1.6	4	2.3	11.51	9.32	7.08	26.5	0.02	99.7	-	369
Chatcolet Lake SH	2197	DBSS	5/29/97	-	1.6	3	2.3	11.53	9.32	7.08	26.5	0.02	99.9	-	369
Chatcolet Lake SH	2197	DBSS	5/29/97	-	1.6	2	2.3	11.52	9.33	7.07	26.5	0.02	100	-	369
Chatcolet Lake SH	2197	DBSS	5/29/97	-	1.6	1	2.4	11.57	9.35	7.08	26.6	0.02	100.3	-	368
Chatcolet Lake SH	2397	DBAS	6/11/97	-	1.6	10	0.4	10.75	11.8	7.09	28.7	0.02	99.1	-	394
Chatcolet Lake SH	2397	DBAS	6/11/97	-	1.6	9	0.4	10.7	11.74	7.1	28.8	0.02	98.5	-	395
Chatcolet Lake SH	2397	DBAS	6/11/97	-	1.6	8	0.3	10.71	11.86	7.11	28.7	0.02	98.8	-	394
Chatcolet Lake SH	2397	DBAS	6/11/97	-	1.6	7	0.9	10.95	11.15	7.1	28.7	0.02	99.4	-	396
Chatcolet Lake SH	2397	DBAS	6/11/97	-	1.6	6	0.9	10.93	11.31	7.11	28.5	0.02	99.6	-	396
Chatcolet Lake SH	2397	DBAS	6/11/97	-	1.6	5	0.9	10.94	11.18	7.12	28.3	0.02	99.4	-	395

Chatcolet Lake SH	2397	DBAS	6/11/97	-	1.6	4	0.9	10.97	11.1	7.11	28.4	0.02	99.5	-	396
Chatcolet Lake SH	2397	DBAS	6/11/97	-	1.6	3	1.5	11.07	10.98	7.11	28.3	0.02	100.1	-	398
Chatcolet Lake SH	2397	DBAS	6/11/97	-	1.6	2	1.5	11.12	10.89	7.11	28.4	0.02	100.4	-	398
Chatcolet Lake SH	2397	DBAS	6/11/97	-	1.6	1	1.5	11.16	10.88	7.12	28.3	0.02	100.7	-	398
Chatcolet Lake SH	2597	DBAC	6/26/97	-	0.7	10	0.2	11.42	11.88	7.25	31.8	0.02	105.4	-	388
Chatcolet Lake SH	2597	DBAC	6/26/97	-	0.7	9	0.2	11.38	11.97	6.9	0.7	0	105.1	-	405
Chatcolet Lake SH	2597	DBAC	6/26/97	-	0.7	8	0.2	11.43	11.9	7.25	31.8	0.02	105.4	-	389
Chatcolet Lake SH	2597	DBAC	6/26/97	-	0.7	7	0.2	11.44	11.88	7.26	31.8	0.02	105.6	-	389
Chatcolet Lake SH	2597	DBAC	6/26/97	-	0.7	6	0.2	11.44	11.92	7.26	31.8	0.02	105.5	-	389
Chatcolet Lake SH	2597	DBAC	6/26/97	-	0.7	5	0.7	11.39	11.87	7.24	31.9	0.02	105	-	392
Chatcolet Lake SH	2597	DBAC	6/26/97	-	0.7	4	0.7	11.41	11.85	7.27	31.8	0.02	105.2	-	391
Chatcolet Lake SH	2597	DBAC	6/26/97	-	0.7	3	0.7	11.43	11.84	7.27	31.8	0.02	105.3	-	391
Chatcolet Lake SH	2597	DBAC	6/26/97	-	0.7	2	0.7	11.4	11.87	7.27	31.8	0.02	105.2	-	391
Chatcolet Lake SH	2597	DBAC	6/26/97	-	0.7	1	0.7	11.44	11.87	7.27	31.8	0.02	105.5	-	391
Chatcolet Lake SH	2797	DBSS	7/8/97	-	0.7	2	0.2	10.12	16.22	7.28	35.2	0.02	*****	-	406
Chatcolet Lake SH	2797	DBSS	7/8/97	-	0.7	1	0.8	10.17	16.19	7.29	35.2	0.02	*****	-	409
Chatcolet Lake SH	2997	SSJD	7/24/97	-	0.8	10	0.3	11.24	22.77	9.09	38.9	0.02	*****	-	356
Chatcolet Lake SH	2997	SSJD	7/24/97	-	0.8	9	0.3	11.33	22.93	9.1	39	0.02	*****	-	357
Chatcolet Lake SH	2997	SSJD	7/24/97	-	0.8	8	0.3	11.39	23.04	9.12	39	0.03	*****	-	356
Chatcolet Lake SH	2997	SSJD	7/24/97	-	0.8	7	0.3	11.5	22.99	9.1	39	0.03	*****	-	357
Chatcolet Lake SH	2997	SSJD	7/24/97	-	0.8	6	0.2	11.19	22.95	9.03	39	0.02	*****	-	361
Chatcolet Lake SH	2997	SSJD	7/24/97	-	0.8	5	1	11.36	20.13	8.43	38.2	0.02	*****	-	382
Chatcolet Lake SH	2997	SSJD	7/24/97	-	0.8	4	1	11.45	20.09	8.47	38	0.02	*****	-	379
Chatcolet Lake SH	2997	SSJD	7/24/97	-	0.8	3	1	11.51	20.11	8.49	38.1	0.02	*****	-	378
Chatcolet Lake SH	2997	SSJD	7/24/97	-	0.8	2	0	11.47	20.18	8.45	38.1	0.02	*****	-	379
Chatcolet Lake SH	2997	SSJD	7/24/97	-	0.8	1	1	11.55	20.09	8.47	38	0.02	*****	-	378
Chatcolet Lake SH	3197	DBSS	8/5/97	-	1	2	0.3	12.26	25.72	9.28	46	0.03	148.1	-	295
Chatcolet Lake SH	3197	DBSS	8/5/97	-	1	1	0.9	12.94	22.95	9.04	46.6	0.03	148.9	-	304
Chatcolet Lake SH	3297	DBSS	8/14/97	-	1.1	2	0.3	11.62	24.37	9.54	53.3	0.03	138	-	279
Chatcolet Lake SH	3297	DBSS	8/14/97	-	1.1	1	1.1	11.73	24.29	9.63	52.4	0.03	139.1	-	276
Chatcolet Lake SH	3497	DBSS	8/27/97	-	0.8	1	0.8	11.39	21.49	8.62	56.9	0.04	128.4	-	277
Chatcolet Lake SH	3797	DBAS	9/16/97	-	1	1	0.8	10.41	15.56	7.79	54.3	0.03	104.2	-	256
Chatcolet Lake SH	3997	ASRA	9/29/97	-	0.4	1	0.4	12.26	16.46	8.31	53.6	0.03	126.8	-	362
Chatcolet Lake SH	4297	DBAS	10/20/97	-	1	2	0.3	10.98	10.61	7.11	53.4	0.03	97.6	-	372
Chatcolet Lake SH	4297	DBAS	10/20/97	-	1	1	0.7	10.16	9.02	7	57.2	0.04	87	-	379

Chatcolet Lake SH	4497	DBAS	11/3/97	-	0.9	2	0.2	11.72	7.28	6.97	42.6	0.03	96.2	*****	418
Chatcolet Lake SH	4497	DBAS	11/3/97	-	0.9	1	0.8	11.86	7.26	6.96	43	0.03	97.3	*****	424

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Benewah Lake	1597	ASSS	4/18/97	-	0.8	3	0.2	11.66	9.27	7.36	28.1	0.02	*****	-	363
Benewah Lake	1597	ASSS	4/18/97	-	0.8	2	1.6	11.46	8.92	7.32	27.9	0.02	99	-	367
Benewah Lake	1597	ASSS	4/18/97	-	0.8	1	4.3	11.42	7.02	7.36	24.8	0.02	*****	-	366
Benewah Lake	1997	DBSS	5/16/97	-	1.1	10	0.3	10.12	16.39	6.97	31.6	0.02	102.6	-	369
Benewah Lake	1997	DBSS	5/16/97	-	1.1	9	1.1	9.81	15.1	6.95	31.2	0.02	96.8	-	371
Benewah Lake	1997	DBSS	5/16/97	-	1.1	8	1.8	11.11	8.71	7	26.6	0.02	94.8	-	372
Benewah Lake	1997	DBSS	5/16/97	-	1.1	7	2.5	11.1	8.53	7.02	26.6	0.02	94.1	-	372
Benewah Lake	1997	DBSS	5/16/97	-	1.1	6	3.3	11.07	8.4	7.01	26.5	0.02	93.6	-	372
Benewah Lake	1997	DBSS	5/16/97	-	1.1	5	3.9	11.04	8.38	7.01	26.7	0.02	93.3	-	372
Benewah Lake	1997	DBSS	5/16/97	-	1.1	4	4.7	11	8.36	7.02	26.7	0.02	92.9	-	372
Benewah Lake	1997	DBSS	5/16/97	-	1.1	3	5.6	10.94	8.36	7.03	27	0.02	92.5	-	371
Benewah Lake	1997	DBSS	5/16/97	-	1.1	2	6.2	10.8	8.35	7.02	27.2	0.02	91	-	371
Benewah Lake	1997	DBSS	5/16/97	-	1.1	1	7	10.47	8.25	7.04	27.7	0.02	88.2	-	371
Benewah Lake	2197	DBSS	5/29/97	-	2	12	0.8	10.09	13.9	6.97	28	0.02	97.1	-	351
Benewah Lake	2197	DBSS	5/29/97	-	2	11	0.8	10.05	13.88	6.97	27.6	0.02	96.7	-	350
Benewah Lake	2197	DBSS	5/29/97	-	2	10	1.8	10.85	9.35	6.97	27	0.02	94.1	-	351
Benewah Lake	2197	DBSS	5/29/97	-	2	9	1.8	11.02	9.17	6.96	27	0.02	95.1	-	351
Benewah Lake	2197	DBSS	5/29/97	-	2	8	2.8	11.1	8.71	6.94	26.7	0.02	94.8	-	351
Benewah Lake	2197	DBSS	5/29/97	-	2	7	2.8	11.08	8.65	6.96	26.7	0.02	94.4	-	350
Benewah Lake	2197	DBSS	5/29/97	-	2	6	3.9	10.82	8.37	6.92	26.8	0.02	91.6	-	350
Benewah Lake	2197	DBSS	5/29/97	-	2	5	3.9	10.83	8.35	6.93	26.6	0.02	91.6	-	349
Benewah Lake	2197	DBSS	5/29/97	-	2	4	4.9	10.54	7.89	6.92	26.5	0.02	88.2	-	346
Benewah Lake	2197	DBSS	5/29/97	-	2	3	4.9	10.59	7.89	6.92	26.7	0.02	88.6	-	347
Benewah Lake	2197	DBSS	5/29/97	-	2	2	5.9	10.3	7.66	6.92	26.6	0.02	85.7	-	352
Benewah Lake	2197	DBSS	5/29/97	-	2	1	5.9	10.35	7.65	6.92	26.5	0.02	86.1	-	350
Benewah Lake	2397	DBAS	6/11/97	-	2.5	10	0.4	9.39	17.73	6.99	32.6	0.02	98.5	-	399
Benewah Lake	2397	DBAS	6/11/97	-	2.5	9	0.4	9.43	17.83	7	32.5	0.02	99.1	-	399
Benewah Lake	2397	DBAS	6/11/97	-	2.5	8	0.3	9.43	17.9	7	32.4	0.02	99.2	-	399
Benewah Lake	2397	DBAS	6/11/97	-	2.5	7	0.9	9.82	15.89	7.01	32.7	0.02	99.1	-	399
Benewah Lake	2397	DBAS	6/11/97	-	2.5	6	1.9	10.25	14.21	7	30.3	0.02	99.8	-	400
Benewah Lake	2397	DBAS	6/11/97	-	2.5	5	2.8	11.19	11.04	6.95	28.6	0.02	101.4	-	402
Benewah Lake	2397	DBAS	6/11/97	-	2.5	4	3.9	9.41	8.78	6.86	28.8	0.02	80.9	-	407
Benewah Lake	2397	DBAS	6/11/97	-	2.5	3	4.8	8.36	8.6	6.85	30.2	0.02	71.5	-	407
Benewah Lake	2397	DBAS	6/11/97	-	2.5	2	4.8	8.38	8.6	6.86	29.9	0.02	71.6	-	407

Benewah Lake	2397	DBAS	6/11/97	-	2.5	1	4.8	8.41	8.56	6.87	29.7	0.02	71.8	-	406
Benewah Lake	2597	DBSS	6/26/97	-	3.1	12	0.3	10.31	18.63	7.36	33.9	0.02	110	-	384
Benewah Lake	2597	DBSS	6/26/97	-	3.1	11	0.3	10.3	18.65	7.36	33.9	0.02	110	-	383
Benewah Lake	2597	DBSS	6/26/97	-	3.1	10	0.9	10.32	18.57	7.34	33.9	0.02	110	-	384
Benewah Lake	2597	DBSS	6/26/97	-	3.1	9	0.9	10.31	18.59	7.32	33.9	0.02	109.9	-	384
Benewah Lake	2597	DBSS	6/26/97	-	3.1	8	1.9	10.39	17.97	7.22	34	0.02	109.4	-	386
Benewah Lake	2597	DBSS	6/26/97	-	3.1	7	1.9	10.33	18.02	7.21	33.8	0.02	108.9	-	386
Benewah Lake	2597	DBSS	6/26/97	-	3.1	6	2.8	11.07	13.35	7.02	31.1	0.02	105.6	-	391
Benewah Lake	2597	DBSS	6/26/97	-	3.1	5	2.8	11.04	13.35	7	30.9	0.02	105.3	-	391
Benewah Lake	2597	DBSS	6/26/97	-	3.1	4	3.7	8.49	10.92	6.78	30.5	0.02	76.6	-	398
Benewah Lake	2597	DBSS	6/26/97	-	3.1	3	3.7	8.43	10.9	6.78	30.3	0.02	76	-	398
Benewah Lake	2597	DBSS	6/26/97	-	3.1	2	4.7	5.4	9.84	6.77	33.7	0.02	47.5	-	398
Benewah Lake	2597	DBSS	6/26/97	-	3.1	1	4.7	5.43	9.84	6.78	33.7	0.02	47.7	-	398
Benewah Lake	2797	DBSS	7/8/97	-	2.3	6	0.3	10.59	21.76	8.31	35.9	0.02	*****	-	370
Benewah Lake	2797	DBSS	7/8/97	-	2.3	5	0.8	10.62	21.56	7.85	36	0.02	*****	-	377
Benewah Lake	2797	DBSS	7/8/97	-	2.3	4	1.8	11.49	17.39	7.29	35.3	0.02	*****	-	398
Benewah Lake	2797	DBSS	7/8/97	-	2.3	3	2.7	11.51	14.86	7.09	33.8	0.02	*****	-	408
Benewah Lake	2797	DBSS	7/8/97	-	2.3	2	3.6	9.61	13.13	6.92	33.1	0.02	90.9	-	417
Benewah Lake	2797	DBSS	7/8/97	-	2.3	1	4.6	5.87	11.66	6.9	36	0.02	53.6	-	421
Benewah Lake	2997	SSJD	7/24/97	-	3	10	0.4	10.59	23.51	9.06	37.8	0.02	*****	-	356
Benewah Lake	2997	SSJD	7/24/97	-	3	9	0	10.66	23.29	9.02	37.8	0.02	*****	-	358
Benewah Lake	2997	SSJD	7/24/97	-	3	8	1	10.58	23.37	9.03	37.8	0.02	*****	-	358
Benewah Lake	2997	SSJD	7/24/97	-	3	7	1.9	10.62	23.2	8.9	37.5	0.02	*****	-	361
Benewah Lake	2997	SSJD	7/24/97	-	3	6	2	10.67	23.01	8.72	37.6	0.02	*****	-	366
Benewah Lake	2997	SSJD	7/24/97	-	3	5	3	11.46	18.22	7.41	34	0.02	*****	-	407
Benewah Lake	2997	SSJD	7/24/97	-	3	4	3	11.38	18.08	7.31	33.6	0.02	*****	-	409
Benewah Lake	2997	SSJD	7/24/97	-	3	3	4	10.54	15.01	7.05	33	0.02	*****	-	421
Benewah Lake	2997	SSJD	7/24/97	-	3	2	4	9.11	14.54	6.99	34.9	0.02	88.9	-	426
Benewah Lake	2997	SSJD	7/24/97	-	3	1	4.8	5.06	13.37	6.97	40.5	0.03	48.2	-	437
Benewah Lake	3197	DBSS	8/5/97	-	2.7	5	0.3	11.3	26.45	9.38	42.4	0.03	138.4	-	259
Benewah Lake	3197	DBSS	8/5/97	-	2.7	4	1.6	11.69	24.11	9.41	42.5	0.03	137.3	-	256
Benewah Lake	3197	DBSS	8/5/97	-	2.7	3	2.8	10.7	22.54	8.41	39.8	0.03	122	-	276
Benewah Lake	3197	DBSS	8/5/97	-	2.7	2	3.6	10.2	20.44	7.28	37.3	0.02	111.7	-	309
Benewah Lake	3197	DBSS	8/5/97	-	2.7	1	4.7	2.78	15.59	7.06	47.9	0.03	27.2	-	337
Benewah Lake	3297	DBSS	8/14/97	-	4.3	9	0.4	8.91	23.87	8.9	42	0.03	104.8	-	260
Benewah Lake	3297	DBSS	8/14/97	-	4.3	8	0.9	8.91	23.86	8.9	42	0.03	104.8	-	256
Benewah Lake	3297	DBSS	8/14/97	-	4.3	7	1.4	8.89	23.86	8.91	42	0.03	104.6	-	251
Benewah Lake	3297	DBSS	8/14/97	-	4.3	6	1.9	8.89	23.76	8.83	42.1	0.03	104.4	-	250
Benewah Lake	3297	DBSS	8/14/97	-	4.3	5	2.3	8.88	23.75	8.74	42	0.03	104.3	-	248

Benewah Lake	3297	DBSS	8/14/97	-	4.3	4	2.9	7.94	22.77	8.28	41.6	0.03	91.6	-	254
Benewah Lake	3297	DBSS	8/14/97	-	4.3	3	3.4	8.65	20.97	7.3	41.2	0.03	96.3	-	277
Benewah Lake	3297	DBSS	8/14/97	-	4.3	2	3.9	8.53	20.2	7.12	41.6	0.03	93.4	-	277
Benewah Lake	3297	DBSS	8/14/97	-	4.3	1	4.4	2.15	18.22	6.93	49.6	0.03	22.7	-	293
Benewah Lake	3497	DBSS	8/27/97	-	3.8	10	0.3	9.39	22.33	8.27	46.4	0.03	107.6	-	271
Benewah Lake	3497	DBSS	8/27/97	-	3.8	9	0.8	9.41	22.18	8.36	46.5	0.03	107.5	-	264
Benewah Lake	3497	DBSS	8/27/97	-	3.8	8	1.3	9.42	22.08	8.35	46.6	0.03	107.3	-	263
Benewah Lake	3497	DBSS	8/27/97	-	3.8	7	1.8	9.46	21.85	8.37	46.6	0.03	107.3	-	260
Benewah Lake	3497	DBSS	8/27/97	-	3.8	6	2.3	9.64	21.58	8.49	46.6	0.03	108.8	-	253
Benewah Lake	3497	DBSS	8/27/97	-	3.8	5	2.8	9.6	21.49	8.45	46.6	0.03	108.1	-	250
Benewah Lake	3497	DBSS	8/27/97	-	3.8	4	3.3	9.59	21.44	8.39	46.7	0.03	108	-	248
Benewah Lake	3497	DBSS	8/27/97	-	3.8	3	3.7	9.2	21.32	8.03	46.6	0.03	103.3	-	248
Benewah Lake	3497	DBSS	8/27/97	-	3.8	2	4.3	3.62	19.73	6.74	54.2	0.03	39.4	-	292
Benewah Lake	3497	DBSS	8/27/97	-	3.8	1	4.8	1.44	18.97	6.69	57.1	0.04	15.5	-	280
Benewah Lake	3797	DBAS	9/16/97	-	1.5	10	0.2	8.58	17.07	7.22	46.1	0.03	88.5	-	308
Benewah Lake	3797	DBAS	9/16/97	-	1.5	9	0.5	8.57	17.07	7.22	46	0.03	88.6	-	308
Benewah Lake	3797	DBAS	9/16/97	-	1.5	8	1	8.56	17.05	7.22	46.1	0.03	88.4	-	307
Benewah Lake	3797	DBAS	9/16/97	-	1.5	7	1.5	8.53	17.07	7.23	46	0.03	88.3	-	306
Benewah Lake	3797	DBAS	9/16/97	-	1.5	6	2	8.57	17.07	7.23	46	0.03	88.6	-	304
Benewah Lake	3797	DBAS	9/16/97	-	1.5	5	2.5	8.64	17.05	7.23	46.1	0.03	89.3	-	302
Benewah Lake	3797	DBAS	9/16/97	-	1.5	4	3	8.7	17.05	7.23	46	0.03	90	-	300
Benewah Lake	3797	DBAS	9/16/97	-	1.5	3	3.5	8.73	17.03	7.23	46.1	0.03	90.2	-	297
Benewah Lake	3797	DBAS	9/16/97	-	1.5	2	4	8.71	17.03	7.24	46	0.03	90	-	296
Benewah Lake	3797	DBAS	9/16/97	-	1.5	1	4.5	8.73	17.03	7.23	46	0.03	90.2	-	300
Benewah Lake	3997	ASRA	9/29/97	-	2.2	8	0.3	9.77	16.41	7.41	45.9	0.03	100.9	-	382
Benewah Lake	3997	ASRA	9/29/97	-	2.2	7	1	9.9	15.76	7.41	46	0.03	100.8	-	382
Benewah Lake	3997	ASRA	9/29/97	-	2.2	6	1.5	9.87	15.4	7.39	45.8	0.03	99.8	-	383
Benewah Lake	3997	ASRA	9/29/97	-	2.2	5	2	9.78	15.3	7.37	45.8	0.03	98.7	-	383
Benewah Lake	3997	ASRA	9/29/97	-	2.2	4	2.5	9.49	15.19	7.33	45.8	0.03	95.5	-	385
Benewah Lake	3997	ASRA	9/29/97	-	2.2	3	3	9.42	15.1	7.32	45.8	0.03	94.6	-	384
Benewah Lake	3997	ASRA	9/29/97	-	2.2	2	3.5	9.16	15.04	7.3	45.8	0.03	91.9	-	385
Benewah Lake	3997	ASRA	9/29/97	-	2.2	1	4	9.09	15.04	7.31	45.9	0.03	91.2	-	384
Benewah Lake	4297	DBAS	10/20/97	-	2.2	9	0.3	10.61	10.45	7.15	49.1	0.03	94	-	369
Benewah Lake	4297	DBAS	10/20/97	-	2.2	8	0.6	10.61	10.48	7.12	49.3	0.03	94	-	372
Benewah Lake	4297	DBAS	10/20/97	-	2.2	7	1.1	10.63	10.48	7.11	49.3	0.03	94.2	-	372
Benewah Lake	4297	DBAS	10/20/97	-	2.2	6	1.6	10.63	10.43	7.11	49.4	0.03	94.1	-	372
Benewah Lake	4297	DBAS	10/20/97	-	2.2	5	2.1	10.6	10.45	7.08	49.3	0.03	93.8	-	372
Benewah Lake	4297	DBAS	10/20/97	-	2.2	4	2.6	10.55	10.41	7.04	49.3	0.03	93.3	-	373
Benewah Lake	4297	DBAS	10/20/97	-	2.2	3	3.1	10.17	10.41	7.02	49.5	0.03	90	-	373
Benewah Lake	4297	DBAS	10/20/97	-	2.2	2	3.6	9.84	10.4	6.97	49.8	0.03	87	-	375

Benewah Lake	4297	DBAS	10/20/97	-	2.2	1	4.1	9.71	10.38	6.86	49.8	0.03	85.8	-	378

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
St. Joe River	1597	AS SS	4/18/97	-	1.1	2	0.2	12.89		7.41	32.4	0.02	102.6	-	-
St. Joe River	1597	AS SS	4/18/97	-	1.1	1	5	13.21	5.54	7.41	32.3	0.02	*****	-	356
St. Joe River	1997	DBSS	5/16/97	-	0.4	12	0.2	11.4	8.54	6.99	25.9	0.02	96.7	-	356
St. Joe River	1997	DBSS	5/16/97	-	0.4	11	1	11.41	8.46	6.96	25.9	0.02	96.6	-	364
St. Joe River	1997	DBSS	5/16/97	-	0.4	10	1.9	11.44	8.36	6.97	25.9	0.02	96.6	-	365
St. Joe River	1997	DBSS	5/16/97	-	0.4	9	3	11.44	8.36	6.96	25.9	0.02	96.4	-	365
St. Joe River	1997	DBSS	5/16/97	-	0.4	8	4.1	11.44	8.36	6.96	25.9	0.02	96.5	-	366
St. Joe River	1997	DBSS	5/16/97	-	0.4	7	5	11.44	8.35	6.95	25.9	0.02	96.6	-	367
St. Joe River	1997	DBSS	5/16/97	-	0.4	6	6	11.46	8.35	6.96	26	0.02	96.7	-	367
St. Joe River	1997	DBSS	5/16/97	-	0.4	5	6.9	11.43	8.38	6.96	25.9	0.02	96.5	-	368
St. Joe River	1997	DBSS	5/16/97	-	0.4	4	8	11.43	8.38	6.96	26	0.02	96.6	-	369
St. Joe River	1997	DBSS	5/16/97	-	0.4	3	9.2	11.39	8.4	6.97	26	0.02	96.3	-	369
St. Joe River	1997	DBSS	5/16/97	-	0.4	2	10	11.44	8.4	6.99	25.9	0.02	96.7	-	371
St. Joe River	1997	DBSS	5/16/97	-	0.4	1	11.2	11.45	8.4	6.99	25.9	0.02	96.8	-	373
St. Joe River	2197	DBSS	5/29/97	-	1.1	10	0.3	11.53	8.97	7.08	26.3	0.02	99.1	-	363
St. Joe River	2197	DBSS	5/29/97	-	1.1	9	0.3	11.53	8.99	7.09	26.4	0.02	99.1	-	362
St. Joe River	2197	DBSS	5/29/97	-	1.1	8	0.3	11.51	8.99	7.08	26.6	0.02	98.9	-	363
St. Joe River	2197	DBSS	5/29/97	-	1.1	7	0.3	11.53	8.97	7.09	26.1	0.02	99.1	-	363
St. Joe River	2197	DBSS	5/29/97	-	1.1	6	0.3	11.53	8.99	7.09	26.4	0.02	99.1	-	363
St. Joe River	2197	DBSS	5/29/97	-	1.1	5	9.1	11.53	8.97	7.06	26.5	0.02	98.7	-	366
St. Joe River	2197	DBSS	5/29/97	-	1.1	4	10	11.51	8.97	7.06	26.5	0.02	98.9	-	366
St. Joe River	2197	DBSS	5/29/97	-	1.1	3	10.1	11.51	8.99	7.07	26.7	0.02	98.8	-	366
St. Joe River	2197	DBSS	5/29/97	-	1.1	2	10.5	11.5	8.97	7.06	26.4	0.02	98.9	-	366
St. Joe River	2197	DBSS	5/29/97	-	1.1	1	10.6	11.49	8.97	7.06	26.6	0.02	99.1	-	366
St. Joe River	2397	DBAS	6/11/97	-	1.7	10	0.8	11.35	10.28	7.13	28.1	0.02	100.9	-	394
St. Joe River	2397	DBAS	6/11/97	-	1.7	9	0.8	11.33	10.3	7.13	28.1	0.02	100.9	-	394
St. Joe River	2397	DBAS	6/11/97	-	1.7	8	0.9	11.33	10.3	7.13	28.1	0.02	100.9	-	394
St. Joe River	2397	DBAS	6/11/97	-	1.7	7	0.9	11.33	10.3	7.13	28.1	0.02	100.9	-	394
St. Joe River	2397	DBAS	6/11/97	-	1.7	6	0.8	11.35	10.3	7.12	28.1	0.02	101	-	395
St. Joe River	2397	DBAS	6/11/97	-	1.7	5	0.9	11.35	10.3	7.13	28.1	0.02	101	-	395
St. Joe River	2397	DBAS	6/11/97	-	1.7	4	0.9	11.36	10.3	7.13	28.1	0.02	101.1	-	395
St. Joe River	2397	DBAS	6/11/97	-	1.7	3	0.9	11.37	10.28	7.13	28.1	0.02	101.1	-	395
St. Joe River	2397	DBAS	6/11/97	-	1.7	2	1.1	11.37	10.28	7.14	28.1	0.02	101.2	-	395
St. Joe River	2397	DBAS	6/11/97	-	1.7	1	0.9	11.38	10.3	7.11	28	0.02	101.3	-	398
St. Joe River	2597	DBSS	6/26/97	-	3.1	11	0.2	11.21	10.68	7.18	32.1	0.02	100.6	-	399

St. Joe River	2597	DBSS	6/26/97	-	3.1	10	1	11.17	10.66	7.17	32.1	0.02	100.1	-	400
St. Joe River	2597	DBSS	6/26/97	-	3.1	9	1.9	11.2	10.64	7.17	32.1	0.02	100.4	-	402
St. Joe River	2597	DBSS	6/26/97	-	3.1	8	2.9	11.17	10.64	7.17	32.1	0.02	100.2	-	402
St. Joe River	2597	DBSS	6/26/97	-	3.1	7	4	11.19	10.64	7.17	32	0.02	100.3	-	402
St. Joe River	2597	DBSS	6/26/97	-	3.1	6	4.9	11.17	10.64	7.17	32.1	0.02	100.2	-	402
St. Joe River	2597	DBSS	6/26/97	-	3.1	5	6.1	11.19	10.64	7.17	32	0.02	100.3	-	402
St. Joe River	2597	DBSS	6/26/97	-	3.1	4	7.1	11.18	10.61	7.18	32	0.02	100.1	-	401
St. Joe River	2597	DBSS	6/26/97	-	3.1	3	8.1	11.18	10.62	7.17	32.1	0.02	100	-	401
St. Joe River	2597	DBSS	6/26/97	-	3.1	2	9	11.18	10.62	7.18	32	0.02	100.2	-	400
St. Joe River	2597	DBSS	6/26/97	-	3.1	1	11.2	11.2	10.67	7.19	32	0.02	100.4	-	400
St. Joe River	2797	DBSS	7/8/97	-	2.5	13	0.4	9.9	15.06	7.14	34.6	0.02	97.6	-	414
St. Joe River	2797	DBSS	7/8/97	-	2.5	12	1.3	9.89	15.04	7.16	34.6	0.02	97.5	-	414
St. Joe River	2797	DBSS	7/8/97	-	2.5	11	2.4	9.9	15.07	7.15	34.6	0.02	97.6	-	415
St. Joe River	2797	DBSS	7/8/97	-	2.5	10	3.5	9.92	15.02	7.15	34.6	0.02	97.7	-	415
St. Joe River	2797	DBSS	7/8/97	-	2.5	9	4.4	9.9	15.09	7.15	34.6	0.02	97.8	-	415
St. Joe River	2797	DBSS	7/8/97	-	2.5	8	5.4	9.9	15.06	7.15	34.6	0.02	97.7	-	416
St. Joe River	2797	DBSS	7/8/97	-	2.5	7	6.4	9.89	15.02	7.15	34.6	0.02	97.5	-	416
St. Joe River	2797	DBSS	7/8/97	-	2.5	6	7.4	9.88	15.02	7.16	34.6	0.02	97.4	-	416
St. Joe River	2797	DBSS	7/8/97	-	2.5	5	8.3	9.9	15.02	7.16	34.6	0.02	97.6	-	416
St. Joe River	2797	DBSS	7/8/97	-	2.5	4	9.4	9.89	15.06	7.16	34.6	0.02	97.5	-	416
St. Joe River	2797	DBSS	7/8/97	-	2.5	3	10.4	9.91	15.06	7.18	34.6	0.02	97.7	-	416
St. Joe River	2797	DBSS	7/8/97	-	2.5	2	11.4	9.93	15.06	7.19	34.6	0.02	98	-	416
St. Joe River	2797	DBSS	7/8/97	-	2.5	1	12.3	10.07	15.07	7.22	34.6	0.02	99.3	-	416
St. Joe River	2997	SSJD	7/24/97	-	3	11	0.3	9.37	18.94	7.2	38.3	0.02	*****	-	430
St. Joe River	2997	SSJD	7/24/97	-	3	10	1.3	9.42	18.47	7.2	38.2	0.02	99.9	-	431
St. Joe River	2997	SSJD	7/24/97	-	3	9	2.3	9.4	18.22	7.21	38.1	0.02	99.2	-	432
St. Joe River	2997	SSJD	7/24/97	-	3	8	3.3	9.42	18.15	7.21	38.2	0.02	99.2	-	432
St. Joe River	2997	SSJD	7/24/97	-	3	7	4.3	9.43	18.22	7.21	38.2	0.02	99.5	-	433
St. Joe River	2997	SSJD	7/24/97	-	3	6	5.3	9.41	18.22	7.2	38.1	0.02	99.3	-	434
St. Joe River	2997	SSJD	7/24/97	-	3	5	6.3	9.4	18.1	7.21	38.1	0.02	99	-	433
St. Joe River	2997	SSJD	7/24/97	-	3	4	7.3	9.41	18.22	7.21	38.1	0.02	99.3	-	434
St. Joe River	2997	SSJD	7/24/97	-	3	3	8.3	9.4	18.18	7.22	38.1	0.02	99.1	-	434
St. Joe River	2997	SSJD	7/24/97	-	3	2	9.3	9.43	18.1	7.25	38.1	0.02	99.3	-	434
St. Joe River	2997	SSJD	7/24/97	-	3	1	10.3	9.47	18.08	7.29	38.1	0.02	99.7	-	434
St. Joe River	3197	DBSS	8/5/97	-	3	13	0.3	9.07	23.01	7.3	44.8	0.03	104.4	-	351
St. Joe River	3197	DBSS	8/5/97	-	3	12	1.5	9.11	21.37	7.26	44.5	0.03	101.5	-	354
St. Joe River	3197	DBSS	8/5/97	-	3	11	2.4	9	21.28	7.25	44.7	0.03	100.2	-	355
St. Joe River	3197	DBSS	8/5/97	-	3	10	3.4	8.91	20.55	7.22	44.3	0.03	97.8	-	356
St. Joe River	3197	DBSS	8/5/97	-	3	9	4.5	8.64	19.94	7.19	44	0.03	93.7	-	357
St. Joe River	3197	DBSS	8/5/97	-	3	8	5.5	8.62	19.71	7.19	44.1	0.03	93.1	-	356
St. Joe River	3197	DBSS	8/5/97	-	3	7	6.5	8.54	19.57	7.19	43.7	0.03	92	-	356

St. Joe River	3197	DBSS	8/5/97	-	3	6	7.5	8.51	19.45	7.19	43.7	0.03	91.3	-	356
St. Joe River	3197	DBSS	8/5/97	-	3	5	8.5	8.46	19.33	7.19	43.8	0.03	90.6	-	356
St. Joe River	3197	DBSS	8/5/97	-	3	4	9.5	8.44	19.26	7.19	43.6	0.03	90.3	-	356
St. Joe River	3197	DBSS	8/5/97	-	3	3	10.5	8.43	19.25	7.19	43.7	0.03	90.2	-	356
St. Joe River	3197	DBSS	8/5/97	-	3	2	11.5	8.4	19.25	7.19	43.7	0.03	89.8	-	355
St. Joe River	3197	DBSS	8/5/97	-	3	1	12.1	8.4	19.3	7.2	43.6	0.03	89.9	-	354
St. Joe River	3497	DBSS	8/27/97	-	4	14	0.2	8.47	20.77	7.23	55.6	0.04	94.3	-	317
St. Joe River	3497	DBSS	8/27/97	-	4	13	0.8	8.49	20.27	7.25	55.8	0.04	93.4	-	316
St. Joe River	3497	DBSS	8/27/97	-	4	12	1.7	8.47	20.2	7.24	55.7	0.04	93.1	-	317
St. Joe River	3497	DBSS	8/27/97	-	4	11	2.7	8.49	20.2	7.25	55.6	0.04	93.2	-	316
St. Joe River	3497	DBSS	8/27/97	-	4	10	3.7	8.49	20.2	7.24	55.7	0.04	93.3	-	316
St. Joe River	3497	DBSS	8/27/97	-	4	9	4.6	8.48	20.15	7.24	55.6	0.04	93	-	316
St. Joe River	3497	DBSS	8/27/97	-	4	8	5.6	8.46	20.09	7.24	55.6	0.04	92.9	-	316
St. Joe River	3497	DBSS	8/27/97	-	4	7	6.4	8.41	20.08	7.23	55.5	0.04	92.3	-	316
St. Joe River	3497	DBSS	8/27/97	-	4	6	7.5	8.4	20.02	7.23	55.6	0.04	92	-	316
St. Joe River	3497	DBSS	8/27/97	-	4	5	8.5	8.39	20.02	7.24	55.5	0.04	91.9	-	315
St. Joe River	3497	DBSS	8/27/97	-	4	4	9.6	8.38	20.01	7.24	55.6	0.04	91.7	-	315
St. Joe River	3497	DBSS	8/27/97	-	4	3	10.4	8.38	20.01	7.25	55.5	0.04	91.7	-	314
St. Joe River	3497	DBSS	8/27/97	-	4	2	11.5	8.41	20.01	7.26	55.7	0.04	92	-	313
St. Joe River	3497	DBSS	8/27/97	-	4	1	12.7	8.43	20.04	7.27	55.6	0.04	92.3	-	313
St. Joe River	3797	DBAS	9/16/97	-	3.5	13	0.2	8.51	17.45	7.2	54.9	0.04	88.7	-	308
St. Joe River	3797	DBAS	9/16/97	-	3.5	12	0.9	8.48	17.51	7.21	55.2	0.04	88.5	-	307
St. Joe River	3797	DBAS	9/16/97	-	3.5	11	1.9	8.47	17.47	7.2	55.1	0.04	88.3	-	308
St. Joe River	3797	DBAS	9/16/97	-	3.5	10	2.9	8.47	17.45	7.19	55.2	0.04	88.3	-	307
St. Joe River	3797	DBAS	9/16/97	-	3.5	9	3.9	8.48	17.44	7.21	55.1	0.04	88.3	-	305
St. Joe River	3797	DBAS	9/16/97	-	3.5	8	4.9	8.49	17.43	7.2	55.1	0.04	88.5	-	305
St. Joe River	3797	DBAS	9/16/97	-	3.5	7	5.9	8.51	17.44	7.2	55.3	0.04	88.6	-	305
St. Joe River	3797	DBAS	9/16/97	-	3.5	6	6.9	8.49	17.42	7.2	55.2	0.04	88.6	-	303
St. Joe River	3797	DBAS	9/16/97	-	3.5	5	7.9	8.48	17.42	7.21	55.2	0.04	88.3	-	303
St. Joe River	3797	DBAS	9/16/97	-	3.5	4	8.9	8.51	17.42	7.21	55.3	0.04	88.6	-	302
St. Joe River	3797	DBAS	9/16/97	-	3.5	3	9.9	8.51	17.42	7.21	55.2	0.04	88.6	-	301
St. Joe River	3797	DBAS	9/16/97	-	3.5	2	10.9	8.53	17.44	7.22	55.2	0.04	88.8	-	300
St. Joe River	3797	DBAS	9/16/97	-	3.5	1	11.9	8.54	17.41	7.23	55.2	0.04	89	-	299
St. Joe River	3997	ASRA	9/29/97	-	2.7	11	0.2	9.83	16.29	7.24	52.9	0.03	101.3	-	397
St. Joe River	3997	ASRA	9/29/97	-	2.7	10	1.6	9.77	14.01	7.22	52.5	0.03	95.8	-	400
St. Joe River	3997	ASRA	9/29/97	-	2.7	9	2.6	9.71	13.91	7.22	52.4	0.03	95	-	400
St. Joe River	3997	ASRA	9/29/97	-	2.7	8	3.6	9.72	13.88	7.23	52.5	0.03	95.1	-	400
St. Joe River	3997	ASRA	9/29/97	-	2.7	7	4.6	9.66	13.86	7.23	52.4	0.03	94.4	-	399
St. Joe River	3997	ASRA	9/29/97	-	2.7	6	5.6	9.47	13.86	7.24	52.5	0.03	92.6	-	399
St. Joe River	3997	ASRA	9/29/97	-	2.7	5	6.6	9.44	13.86	7.25	52.3	0.03	92.3	-	399
St. Joe River	3997	ASRA	9/29/97	-	2.7	4	7.6	9.46	13.83	7.25	52.3	0.03	92.3	-	398

St. Joe River	3997	ASRA	9/29/97	-	2.7	3	8.6	9.43	13.88	7.27	52.2	0.03	92.1	-	398
St. Joe River	3997	ASRA	9/29/97	-	2.7	2	9.6	9.55	13.83	7.27	52.3	0.03	93.3	-	398
St. Joe River	3997	ASRA	9/29/97	-	2.7	1	10.6	9.5	13.83	7.29	52.3	0.03	92.7	-	397
St. Joe River	4297	DBAS	10/20/97	-	2.1	11	0.3	10.77	9.06	6.97	56.7	0.04	92.3	-	399
St. Joe River	4297	DBAS	10/20/97	-	2.1	10	1.3	10.75	9.07	6.95	56.7	0.04	92.1	-	402
St. Joe River	4297	DBAS	10/20/97	-	2.1	9	2.3	10.76	9.06	6.93	56.7	0.04	92.1	-	403
St. Joe River	4297	DBAS	10/20/97	-	2.1	8	3.3	10.76	9.06	6.91	56.7	0.04	92.1	-	404
St. Joe River	4297	DBAS	10/20/97	-	2.1	7	4.3	10.74	9.06	6.91	56.6	0.04	92	-	405
St. Joe River	4297	DBAS	10/20/97	-	2.1	6	5.3	10.76	9.06	6.88	56.6	0.04	92.1	-	406
St. Joe River	4297	DBAS	10/20/97	-	2.1	5	6.3	10.76	9.04	6.87	56.7	0.04	92.2	-	406
St. Joe River	4297	DBAS	10/20/97	-	2.1	4	7.3	10.78	9.02	6.85	56.6	0.04	92.3	-	407
St. Joe River	4297	DBAS	10/20/97	-	2.1	3	8.3	10.78	9.04	6.83	56.6	0.04	92.3	-	408
St. Joe River	4297	DBAS	10/20/97	-	2.1	2	9.3	10.8	9.02	6.81	56.5	0.04	92.4	-	408
St. Joe River	4297	DBAS	10/20/97	-	2.1	1	10.3	10.83	9.04	6.76	56.7	0.04	92.8	-	411
St. Joe River	4497	DBAS	11/3/97	-	1	11	0.4	11.9	7.03	6.63	39.7	0.03	96.8	*****	436
St. Joe River	4497	DBAS	11/3/97	-	1	10	1.8	11.93	7.02	6.61	39.9	0.03	96.9	*****	438
St. Joe River	4497	DBAS	11/3/97	-	1	9	2.8	11.9	7.03	6.63	39.8	0.03	96.8	*****	438
St. Joe River	4497	DBAS	11/3/97	-	1	8	3.8	11.92	7.03	6.61	39.8	0.03	96.9	*****	438
St. Joe River	4497	DBAS	11/3/97	-	1	7	4.8	11.89	7.04	6.61	39.9	0.03	96.6	*****	437
St. Joe River	4497	DBAS	11/3/97	-	1	6	5.8	11.93	7.06	6.61	39.8	0.03	96.9	*****	436
St. Joe River	4497	DBAS	11/3/97	-	1	5	6.8	11.93	7.06	6.61	39.9	0.03	96.9	*****	436
St. Joe River	4497	DBAS	11/3/97	-	1	4	7.8	11.95	7.07	6.61	40.2	0.03	97.1	*****	438
St. Joe River	4497	DBAS	11/3/97	-	1	3	8.8	11.96	7.08	6.61	39.9	0.03	97.3	*****	438
St. Joe River	4497	DBAS	11/3/97	-	1	2	9.8	12	7.08	6.61	39.9	0.03	97.6	*****	438
St. Joe River	4497	DBAS	11/3/97	-	1	1	10.7	11.99	7.09	6.63	39.9	0.03	97.5	*****	441

Appendix A.2 Vertical hydrolab profiles for all thirteen station on Coeur d'Alene Lake, 1998.

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	13	0.3	13.29	4.16	6.94	49.5	0.03	101	59	405
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	12	1.2	13.33	4.03	6.98	49.5	0.03	101	43	403
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	11	2.2	13.39	3.91	6.98	49.6	0.03	101.1	113	403
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	10	3.2	13.38	3.91	6.91	49.7	0.03	101	101	407
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	9	4.2	13.43	3.88	6.91	49.8	0.03	101.3	149	406
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	8	5.2	13.5	3.88	6.9	49.8	0.03	101.8	59	405
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	7	6.2	13.52	3.91	6.86	49.8	0.03	102.1	131	406
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	6	7.2	13.53	3.94	6.81	49.7	0.03	102.2	51	406
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	5	8.2	13.54	3.98	6.82	49.9	0.03	102.4	154	405
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	4	9.2	13.5	3.96	6.72	49.6	0.03	102.1	103	407
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	3	10.2	13.49	4.01	6.69	49.8	0.03	102.1	158	407
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	2	11.2	13.39	4.26	6.58	49.7	0.03	102	201	408
Rockford Bay	1098	DBRP	3/13/98	10:09:11	3	1	12.2	13.08	4.54	6.42	50.9	0.03	100.4	215	409
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	14	0.3	12.86	5.87	7.09	51.3	0.03	103	124	441
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	13	1.3	12.9	5.77	7.05	51.5	0.03	103.1	128	444
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	12	2.3	12.88	5.6	7.06	51.2	0.03	102.5	53	444
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	11	3.3	12.82	5.36	6.97	51	0.03	101.4	121	448
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	10	4.3	12.79	5.41	6.95	51.2	0.03	101.3	111	449
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	9	5.2	12.76	5.14	6.96	51.1	0.03	100.3	141	447
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	8	6.2	12.75	5.03	6.97	51.7	0.03	100	114	446
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	7	7.1	12.75	5.03	6.92	51.5	0.03	100	107	448
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	6	8.1	12.71	4.99	6.92	51.7	0.03	99.5	120	447
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	5	9.2	12.68	4.96	6.91	51.8	0.03	99.2	104	447
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	4	10.2	12.49	4.88	6.87	52.2	0.03	97.6	137	447
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	3	11.3	12.43	4.79	6.85	52.2	0.03	96.9	110	447
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	2	12.3	12.3	4.81	6.86	52.5	0.03	95.9	242	446
Rockford Bay	1498	DBAS	4/8/98	9:40:15	2.9	1	13.2	11.97	4.96	6.79	53.9	0.03	93.7	433	447
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	13	0.1	11.7	15	7	47.4	0.03	114.2	129	390
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	12	1.6	12.33	10.3	7.17	45.9	0.03	108.3	40	383
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	11	2.6	12.33	9.86	7.15	46.5	0.03	107.1	34	383
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	10	3.6	12.33	9.2	7.11	47.1	0.03	105.4	40	385
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	9	4.5	12.33	8.79	7.05	47.1	0.03	104.4	56	387
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	8	5.6	12.36	8.3	7.04	47.5	0.03	103.4	34	387
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	7	6.6	12.36	8.25	7.03	47.7	0.03	103.3	38	386
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	6	7.4	12.36	7.53	6.98	47.9	0.03	101.4	57	388
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	5	8.5	12.36	7.4	6.99	48.3	0.03	101.1	44	387
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	4	9.4	12.36	6.94	6.91	48.4	0.03	100	59	391

Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	3	10.6	12.36	6.82	6.94	48.6	0.03	99.7	56	388
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	2	11.6	12.29	6.69	6.89	48.4	0.03	98.8	132	390
Rockford Bay	1698	DBASRP	4/23/98	13:24:29	5	1	12.5	12.4	6.44	6.87	48.8	0.03	99.1	157	390
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	14	0.3	11.57	10.9	7.25	42.3	0.03	105.6	119	399
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	13	1.6	11.6	10.8	7.23	42.2	0.03	105.8	101	401
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	12	2.6	11.6	10.7	7.21	42.2	0.03	105.5	135	401
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	11	3.6	11.66	10.5	7.22	42.5	0.03	105.5	327	399
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	10	4.6	11.61	10.3	7.23	41.9	0.03	104.5	118	395
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	9	5.6	11.65	10.2	7.12	43.1	0.03	104.8	120	398
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	8	6.6	11.49	10	7.08	43.2	0.03	102.8	301	398
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	7	7.6	11.43	9.74	7.08	42.8	0.03	101.6	112	394
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	6	8.6	11.49	9.51	7.02	43.4	0.03	101.6	133	395
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	5	9.6	11.39	9.02	6.96	44.2	0.03	99.5	147	395
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	4	10.6	11.39	8.92	7	44.4	0.03	99.3	235	390
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	3	11.6	11.42	8.6	6.89	44.8	0.03	98.8	118	391
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	2	12.6	11.42	8.07	6.88	45.6	0.03	97.5	57	388
Rockford Bay	2198	ASJLDT	5/26/98	11:37:29	3.6	1	13.6	11.4	7.86	6.89	46.2	0.03	96.8	318	386
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	14	0.3	10.87	16.9	7.63	44.2	0.03	112.2	54	442
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	13	1.4	10.89	16.7	7.62	44.2	0.03	112.1	52	445
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	12	2.4	10.92	16.4	7.61	44.3	0.03	111.7	56	447
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	11	3.4	11	16.1	7.6	44.1	0.03	111.8	53	450
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	10	4.4	10.98	16	7.57	43.6	0.03	111.2	125	451
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	9	5.4	11.04	15.8	7.55	43.7	0.03	111.5	43	454
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	8	6.4	11.1	15.7	7.54	44.3	0.03	111.9	128	455
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	7	7.4	11.11	15.6	7.51	44.3	0.03	111.7	111	458
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	6	8.4	11.2	15.4	7.5	44.1	0.03	112	52	460
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	5	9.4	11.3	15.2	7.49	44.3	0.03	112.7	57	462
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	4	10.4	11.47	14.7	7.46	44.8	0.03	113.2	46	464
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	3	11.4	11.53	13.7	7.37	44.3	0.03	111.3	101	468
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	2	12.4	11.13	12.9	7.16	44.1	0.03	105.5	116	475
Rockford Bay	2398	DTJLAS	6/8/98	10:30	4	1	13.4	11	11.9	7.02	43.5	0.03	101.9	231	483
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	14	0.2	10.9	17	7.89	42.7	0.03	113.5	32	437
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	13	1.6	11.09	16.1	7.79	42.5	0.03	113.3	41	443
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	12	2.6	11.1	15.8	7.76	42.5	0.03	112.7	42	445
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	11	3.6	11.02	15.7	7.66	42.6	0.03	111.7	52	448
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	10	4.6	11	15.6	7.63	42.2	0.03	111.1	105	451
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	9	5.6	10.99	15.5	7.53	42.3	0.03	110.8	44	455
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	8	6.6	10.61	15.4	7.33	43.2	0.03	106.8	49	459
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	7	7.6	10.76	15.2	7.35	42.7	0.03	107.8	105	461
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	6	8.6	10.61	14.5	7.15	42.3	0.03	104.6	38	467
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	5	9.6	10.41	13.1	7.04	42.2	0.03	99.6	59	470

Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	4	10.6	10.21	12.4	6.96	42.4	0.03	96.1	58	472
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	3	11.6	10.19	11.3	6.91	41.7	0.03	93.6	124	474
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	2	12.6	9.92	10.7	6.84	42	0.03	89.8	133	477
Rockford Bay	2598	DTASBH	6/24/98	11:01	3.3	1	13.6	9.85	9.92	6.78	42.3	0.03	87.5	619	480
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	14	0.4	10.13	20.7	8.12	44.5	0.03	112.8	133	359
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	13	1.2	10.2	20.3	8.16	44.4	0.03	112.8	134	359
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	12	2.2	10.27	20.2	8.19	44.4	0.03	113.1	131	359
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	11	3.2	10.37	20	8.22	44.4	0.03	113.9	123	359
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	10	4.2	10.38	20	8.22	44.5	0.03	114	125	360
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	9	5.2	10.52	19.7	8.27	44	0.03	114.9	111	360
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	8	6.2	10.64	19.4	8.31	43.7	0.03	115.5	135	360
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	7	7.2	10.73	19.1	8.31	43.6	0.03	115.7	136	361
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	6	8.2	10.81	18.5	8.18	43.4	0.03	115.2	130	366
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	5	9.2	10.77	17	7.88	43.3	0.03	111.1	109	375
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	4	10.2	9.98	14.8	7.21	42.2	0.03	98.3	136	386
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	3	11.2	9.47	13.2	6.98	41.6	0.03	90	159	389
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	2	12.2	9.27	12.4	6.89	41.6	0.03	86.5	19	392
Rockford Bay	2798	ASDNBH	7/8/98	9:03:16	3.3	1	13.2	9	12.2	6.85	41.6	0.03	83.6	412	394
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	13	0.7	9.39	22	7.84	50.7	0.03	107	115	333
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	12	1.7	9.46	21.6	7.84	50.3	0.03	107	101	332
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	11	2.7	9.55	21.3	7.84	50.3	0.03	107.3	101	332
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	10	3.7	9.59	21.1	7.84	49.8	0.03	107.4	104	332
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	9	4.7	9.7	20.6	7.83	49.6	0.03	107.6	112	332
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	8	5.7	9.78	20.3	7.85	49.3	0.03	107.8	110	330
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	7	6.7	9.89	19.9	7.85	49.2	0.03	108.2	58	330
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	6	7.7	9.91	19.7	7.81	49.1	0.03	108	58	329
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	5	8.7	9.94	19.6	7.76	48.9	0.03	108	104	329
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	4	9.7	10.18	18.5	7.72	48.2	0.03	108.4	122	329
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	3	10.7	10.29	17.2	7.54	47.5	0.03	106.7	118	330
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	2	11.7	10.08	14.8	7.34	46.3	0.03	99.1	133	329
Rockford Bay	2998	ASBH	7/20/98	10:54:42	6.5	1	12.7	9.9	13.4	7.16	45.7	0.03	94.6	207	326
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	14	0.3	8.77	24	7.81	55	0.04	103.8	43	334
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	13	1.7	8.79	23.9	7.81	55	0.04	103.7	46	333
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	12	2.8	8.82	23.8	7.82	54.8	0.04	103.9	37	333
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	11	3.9	8.85	23.7	7.81	54.9	0.04	104.1	51	333
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	10	4.9	8.87	23.6	7.8	54.9	0.04	104.2	37	333
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	9	5.8	8.86	23.5	7.78	54.7	0.04	103.8	101	333
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	8	6.9	8.87	23.4	7.77	54.7	0.04	103.8	102	332
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	7	7.9	8.87	23.4	7.68	54.6	0.04	103.7	117	332
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	6	8.8	8.49	23.1	7.45	54.3	0.03	98.8	113	335
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	5	9.7	9.36	20.9	7.48	50.8	0.03	104.4	159	333

Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	4	10.9	10.52	16.9	7.39	47.9	0.03	108.3	124	330
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	3	11.7	9.81	15.3	7.19	47.1	0.03	97.5	143	328
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	2	12.7	9.66	13.8	7.06	46.8	0.03	93	117	316
Rockford Bay	3298	DBAS	8/10/98	10:22:34	9.9	1	13.7	8.63	12.3	7.03	46.8	0.03	80.3	131	376
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	18	0.4	9.09	21.9	7.74	54.6	0.03	103.6	51	347
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	17	1.5	9.07	21.8	7.78	54.5	0.03	103.2	123	348
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	16	2.2	9.06	21.7	7.78	54.8	0.04	103	111	348
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	15	3	9.12	21.4	7.77	54.8	0.04	103	59	350
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	14	3.7	9.12	21.4	7.77	54.6	0.04	102.9	125	350
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	13	4.5	9.13	21.3	7.73	54.8	0.04	102.9	52	352
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	12	5.2	9.13	21.3	7.71	54.7	0.04	102.8	102	352
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	11	6	9.1	21.2	7.67	54.7	0.04	102.4	117	354
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	10	6.7	9.08	21.2	7.64	54.8	0.04	102.2	103	355
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	9	7.5	9.04	21.2	7.56	54.9	0.04	101.6	103	357
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	8	8.2	9.02	21.1	7.49	55	0.04	101.2	113	359
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	7	9	8.92	20.5	7.34	54	0.03	99	109	364
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	6	9.7	9.51	19.3	7.22	51.9	0.03	103.1	47	368
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	5	10.5	10.19	17.3	7.13	47.9	0.03	105.9	133	370
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	4	11.2	9.73	15.4	6.95	46.9	0.03	97.3	110	375
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	3	12	8.71	12.9	6.76	46.7	0.03	82.4	50	378
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	2	12.7	8.56	11.5	6.73	47	0.03	78.4	131	379
Rockford Bay	3498	DTAS	8/24/98	15:12:19	10	1	13.5	8.74	11.5	6.77	47.1	0.03	80	239	377
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	14	0.3	8.93	21.9	7.83	53.6	0.03	102.1	58	330
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	13	1.6	8.95	21.8	7.79	53.4	0.03	102	57	333
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	12	2.6	8.98	21.5	7.78	53.5	0.03	101.8	108	335
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	11	3.6	8.99	21.4	7.76	53.4	0.03	101.8	109	336
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	10	4.6	8.99	21.4	7.73	53.6	0.03	101.7	55	337
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	9	5.6	8.98	21.3	7.7	53.4	0.03	101.5	58	339
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	8	6.6	8.99	21.3	7.69	53.5	0.03	101.6	131	339
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	7	7.6	8.98	21.3	7.66	53.2	0.03	101.4	58	341
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	6	8.6	8.91	21.2	7.56	53.8	0.03	100.4	103	345
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	5	9.6	8.8	21.1	7.46	53.5	0.03	99	123	349
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	4	10.6	8.88	20.4	7.34	53	0.03	98.6	132	353
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	3	11.6	8.79	19	7.01	50	0.03	94.8	54	365
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	2	12.6	8.5	14.1	6.74	46.1	0.03	82.7	38	370
Rockford Bay	3598	DTAS	9/2/98	10:48:53	8.2	1	13.6	7.11	12.3	6.64	47.2	0.03	66.5	715	372
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	14	0.2	9.21	18	7.66	55.4	0.04	97.2	52	361
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	13	1.3	9.21	18	7.61	55.4	0.04	97.2	142	365
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	12	2.3	9.18	17.9	7.59	55.6	0.04	96.7	52	366
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	11	3.2	9.15	17.9	7.57	55.3	0.04	96.3	110	367
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	10	4.3	9.14	17.9	7.55	55.2	0.04	96.1	136	369

Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	9	5.3	9.09	17.8	7.52	55.4	0.04	95.6	116	371
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	8	6.3	9.07	17.8	7.49	55.7	0.04	95.3	213	372
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	7	7.2	9.04	17.8	0	55.4	0.04	94.9	122	372
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	6	8.3	9.06	17.8	7.48	55.7	0.04	95.1	210	374
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	5	9.3	9.03	17.7	7.48	55.3	0.04	94.7	332	374
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	4	10.3	9.03	17.7	7.45	55.6	0.04	94.7	234	376
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	3	11.3	8.97	17.7	7.43	55.7	0.04	94.1	346	378
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	2	12.3	8.93	17.7	7.33	55.5	0.04	93.6	203	382
Rockford Bay	3998	ASKB	9/30/98	10:40:23	7.9	1	13.3	7.81	17.3	7.11	55.5	0.04	81.1	850	389
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	14	0.4	9.39	12.9	7.37	52	0.03	87.7	39	355
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	13	0.9	9.35	12.9	7.37	52	0.03	87.4	37	355
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	12	1.9	9.36	12.9	7.39	52	0.03	87.5	26	354
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	11	2.9	9.32	12.9	7.34	52.1	0.03	87.1	50	356
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	10	3.9	9.35	12.9	7.36	52.1	0.03	87.4	39	356
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	9	4.9	9.33	12.9	7.34	52	0.03	87.2	25	356
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	8	5.9	9.33	12.9	7.34	52.1	0.03	87.1	37	356
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	7	6.9	9.35	12.9	7.34	51.8	0.03	87.4	33	356
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	6	7.9	9.35	12.9	7.35	52.2	0.03	87.4	33	355
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	5	8.9	9.36	12.9	7.34	51.8	0.03	87.5	37	355
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	4	9.9	9.35	12.8	7.34	51.8	0.03	87.3	42	355
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	3	10.9	9.37	12.8	7.32	51.9	0.03	87.3	37	355
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	2	11.9	9.4	12.7	7.32	51.7	0.03	87.6	49	354
Rockford Bay	4298	DTASKB	10/20/98	10:13:09	8.2	1	12.9	9.4	12.6	7.29	52.1	0.03	87.4	138	363
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	17	0.5	8.58	10	7.26	52.7	0.03	75.5	30	385
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	16	1.7	8.59	10	7.24	52.7	0.03	75.6	35	387
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	15	2.7	8.58	10	7.22	52.6	0.03	75.5	32	388
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	14	2.7	8.57	0	7.23	52.7	0.03	82.5	6	390
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	13	3.6	8.56	10	7.24	52.7	0.03	75.4	32	387
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	12	4.6	8.56	10	7.22	52.6	0.03	75.4	37	388
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	11	5.7	8.58	10	7.2	52.7	0.03	75.5	37	390
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	10	6.6	8.58	10	7.21	52.7	0.03	96.8	5	389
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	9	6.7	8.56	0	7.2	52.6	0.03	94.9	8	390
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	8	7.7	8.56	10	7.19	52.9	0.03	75.3	34	390
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	7	8.7	8.56	10	7.2	52.3	0.03	75.3	41	390
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	6	9.7	8.57	9.99	0	52.9	0.03	75.4	52	390
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	5	10.6	8.59	9.92	7.2	52.8	0.03	75.4	107	390
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	3	11.7	8.51	9.82	7.16	52.5	0.03	74.6	101	391
Rockford Bay	4598	KB AS	11/12/98	10:46:32	9.1	2	12.7	8.49	9.78	7.14	52.8	0.03	74.3	59	392

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	15	0.3	13.5	4.31	7.03	53.4	0.03	103.3	36	394
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	14	1	13.6	4.09	7.09	53.3	0.03	102.8	53	393
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	13	2	13.5	4.08	7.06	53.4	0.03	102.6	46	395
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	12	3	13.5	4.04	7.08	53.2	0.03	102.5	55	393
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	11	4	13.5	4.06	7.07	53.5	0.03	102.3	208	393
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	10	5	13.5	4.03	7.01	53.4	0.03	102.2	107	395
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	9	6	13.5	4.01	6.97	53.7	0.03	102.2	114	395
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	8	7	13.5	4.03	6.99	53.9	0.03	102.1	39	394
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	7	8	13.4	4.06	6.94	53.9	0.03	101.9	110	396
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	6	9	13.5	4.04	6.97	54.3	0.03	102	136	393
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	5	10	13.5	4.08	6.93	54.3	0.03	102.2	102	393
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	4	11	13.5	4.08	6.91	54.5	0.03	102.2	116	392
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	3	12	13.5	4.11	6.85	54.5	0.03	102.2	118	394
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	2	13	13.5	4.24	6.79	55.2	0.04	102.6	120	395
Windy Bay Shallow	1098	DBRP	3/13/98	10:42:36	2	1	14	13.6	4.29	6.74	55.4	0.04	103.5	147	394
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	16	0.3	12.6	5.49	6.97	52.4	0.03	100.2	109	437
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	15	1	12.6	5.5	7.01	52.4	0.03	100.2	108	436
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	14	2	12.6	5.41	7.05	52.5	0.03	99.7	54	435
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	13	3	12.6	5.29	7.08	52.4	0.03	99.5	109	434
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	12	4	12.6	5.34	7	52.4	0.03	99.6	142	438
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	11	4.9	12.7	5.26	7.03	52.7	0.03	99.9	41	438
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	10	5.9	12.7	5.17	7.02	52.7	0.03	99.8	100	438
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	9	7	12.7	5.12	6.99	52.7	0.03	99.6	50	439
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	8	8	12.7	5.09	7	52.7	0.03	99.6	134	438
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	7	9	12.7	5.11	7	52.8	0.03	99.4	138	438
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	6	10	12.7	5.11	7.02	52.9	0.03	99.6	59	437
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	5	11	12.7	5.09	6.95	52.9	0.03	99.8	108	440
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	4	12	12.7	5.06	6.95	53	0.03	99.7	157	440
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	3	13	12.7	5.06	6.95	53	0.03	99.8	216	439
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	2	14	12.8	5.08	6.96	52.9	0.03	100.2	140	438
Windy Bay Shallow	1498	DBAS	4/8/98	10:45:10	2.8	1	15	12.8	5.19	6.92	52.8	0.03	100.6	250	439
Windy Bay Shallow	1698	DBASRP	4/24/98	9:31:58	3.5	11	0.3	12.2	6.05	7.08	49	0.03	99.9	103	418
Windy Bay Shallow	1698	DBASRP	4/24/98	9:31:58	3.5	10	1.7	12.2	6.05	7.12	49	0.03	99.4	59	422
Windy Bay Shallow	1698	DBASRP	4/24/98	9:31:58	3.5	9	2.9	12.2	6.02	7.05	49	0.03	99.8	114	425
Windy Bay Shallow	1698	DBASRP	4/24/98	9:31:58	3.5	8	4.6	12.2	6.03	6.96	49.2	0.03	99.4	48	431
Windy Bay Shallow	1698	DBASRP	4/24/98	9:31:58	3.5	7	6.1	12.2	5.79	7.01	49.3	0.03	98.7	124	428
Windy Bay Shallow	1698	DBASRP	4/24/98	9:31:58	3.5	6	7.7	12.2	5.77	6.95	49.2	0.03	98.7	107	431
Windy Bay Shallow	1698	DBASRP	4/24/98	9:31:58	3.5	5	9	12.1	5.82	6.95	49.2	0.03	98.5	41	431
Windy Bay Shallow	1698	DBASRP	4/24/98	9:31:58	3.5	4	10.4	12.1	5.67	6.99	49.4	0.03	97.6	134	428
Windy Bay Shallow	1698	DBASRP	4/24/98	9:31:58	3.5	3	11.9	12.2	4.88	6.88	50.5	0.03	96.3	130	433

Windy Bay Shallow	1698	DBASRP	4/24/98	9:31:58	3.5	2	14	12.2	5.56	6.91	49.6	0.03	98.4	56	431
Windy Bay Shallow	1698	DBASRP	4/24/98	9:31:58	3.5	1	15.7	12.8	5.14	6.93	50.1	0.03	102	116	430
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	13	0.3	11.7	10.51	7.15	42.2	0.03	106.2	52	396
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	12	1.5	11.7	10.48	7.19	42.2	0.03	106.1	108	394
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	11	3	11.7	10.45	7.14	42.2	0.03	105.8	128	395
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	10	4.5	11.7	10.09	7.04	42.9	0.03	104.9	141	397
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	9	6	11.6	9.91	7.05	43	0.03	103.5	153	392
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	8	7.5	11.6	9.73	7	43.1	0.03	102.7	204	391
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	6	9	11.5	9.58	6.94	43.3	0.03	101.9	258	390
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	5	10.5	11.5	9.5	6.93	43.5	0.03	101.7	245	384
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	4	12	11.5	9.4	6.88	43.7	0.03	101.4	125	378
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	3	13.5	11.5	9.22	6.77	44.1	0.03	100.9	147	379
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	2	15	11.5	9.09	6.77	44.1	0.03	100.4	156	370
Windy Bay Shallow	2198	ASJLDT	5/26/98	10:33:29	3.4	1	16.2	11	8.81	6.73	44.7	0.03	95.9	604	383
Windy Bay Shallow	2398	DTJLAS	6/8/98	10:36:03	4	11	0.3	11	17.22	7.82	43.8	0.03	114.8	28	420
Windy Bay Shallow	2398	DTJLAS	6/8/98	10:36:03	4	10	2	11	16.69	7.79	43.7	0.03	113	47	423
Windy Bay Shallow	2398	DTJLAS	6/8/98	10:36:03	4	9	3.5	11	16.36	7.77	43.8	0.03	112.9	37	424
Windy Bay Shallow	2398	DTJLAS	6/8/98	10:36:03	4	8	5	11	16.21	7.75	43.8	0.03	112.5	116	426
Windy Bay Shallow	2398	DTJLAS	6/8/98	10:36:03	4	7	6.5	11.2	15.71	7.71	43.6	0.03	112.4	140	428
Windy Bay Shallow	2398	DTJLAS	6/8/98	10:36:03	4	6	8	11.3	15.39	7.69	43.5	0.03	112.7	143	430
Windy Bay Shallow	2398	DTJLAS	6/8/98	10:36:03	4	5	9.5	11.3	15.01	7.61	43.4	0.03	112	129	433
Windy Bay Shallow	2398	DTJLAS	6/8/98	10:36:03	4	4	11	11.3	13.86	7.45	43	0.03	109.7	50	437
Windy Bay Shallow	2398	DTJLAS	6/8/98	10:36:03	4	3	12.5	11.3	13.33	7.38	43.2	0.03	107.9	114	440
Windy Bay Shallow	2398	DTJLAS	6/8/98	10:36:03	4	2	14	11	12.89	7.27	43.3	0.03	103.9	128	443
Windy Bay Shallow	2398	DTJLAS	6/8/98	10:36:03	4	1	15.5	10.8	12.36	7.21	43.5	0.03	101.1	240	445
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	16	0.3	10.9	16.73	8.09	43.1	0.03	112.5	104	399
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	15	1.6	10.9	16.72	8.07	43.2	0.03	112.6	102	402
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	14	2.6	10.9	16.68	8.04	43	0.03	112.4	59	404
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	13	3.6	10.9	16.63	8.02	43	0.03	112.7	32	405
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	12	4.6	10.9	16.55	7.95	43	0.03	112.5	56	408
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	11	5.6	11	15.79	7.78	42.9	0.03	111.2	54	411
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	10	6.6	10.9		7.65	42.1	0.03	109.3	134	415
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	9	7.6	10.8	15.23	7.58	42.2	0.03	108.6	101	417
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	8	8.6	10.8	15.04	7.48	42	0.03	107.9	101	419
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	7	9.6	10.4	14.03	7.28	41.8	0.03	101.5	121	424
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	6	10.6	10.3	13.55	7.17	42	0.03	99.7	137	427
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	5	11.6	9.78	9.92	6.97	42.4	0.03	86.9	155	431
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	4	12.6	9.97	12.04	6.97	41.7	0.03	93.1	122	432
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	3	13.6	9.71	9.06	6.87	43.6	0.03	84.5	120	434
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	2	14.6	9.7	9.1	6.85	43.4	0.03	84.5	206	436
Windy Bay Shallow	2598	DTASBH	6/24/98	11:03:05	3.1	1	15.6	9.7	9.02	6.86	43.5	0.03	84.4	256	436

Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	16	0.4	9.83	21.33	7.89	46.5	0.03	110.8	134	323
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	15	1.1	10.1	20.86	8	46.2	0.03	112.9	103	318
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	14	2.1	10.1	20.67	8.04	46.3	0.03	112.2	50	318
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	13	3.1	10.2	20.35	8.05	46	0.03	112.9	140	317
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	12	4.1	10.5	19.59	8.17	45.9	0.03	113.9	114	314
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	11	5.1	10.8	18.63	8.23	44.6	0.03	115	107	313
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	10	6.1	10.9	17.86	8.27	44.4	0.03	115	57	313
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	9	7.1	10.5	17.47	8.21	44	0.03	109.6	130	313
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	8	8.1	10.8	17.1	8.05	44	0.03	112.2	122	316
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	7	9.1	10.7	16.66	7.84	43.8	0.03	109.9	118	319
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	6	10.1	10.5	16.39	7.63	43.6	0.03	107.2	126	322
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	5	11.1	9.94	15.74	7.29	43.2	0.03	100	146	326
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	4	12.1	9.73	15.22	7.16	43	0.03	96.7	112	326
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	3	13.1	9.1	13.53	6.96	42	0.03	87.3	109	326
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	2	14.1	9.03	12.89	6.93	41.4	0.03	85.3	153	323
Windy Bay Shallow	2798	ASDNBH	7/8/98	9:04:55	3.1	1	15.1	8.55	12.82	6.93	41.5	0.03	80.6	301	316
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	15	0.4	9.71	20.91	7.89	50.9	0.03	108.4	116	399
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	14	1.4	9.73	20.9	7.92	50.8	0.03	108.5	114	400
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	13	2.4	9.81	20.49	7.94	50.7	0.03	108.6	23	401
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	12	3.4	9.93	20.13	7.97	50.3	0.03	109.2	33	402
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	11	4.4	10.1	19.76	8.09	50.1	0.03	110.4	112	402
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	10	5.4	10.3	19.18	7.94	49.5	0.03	110.5	25	407
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	9	6.4	10.3	18.8	7.8	49	0.03	110.7	36	412
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	8	7.4	10.2	18.39	7.63	48.7	0.03	108.3	112	418
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	7	8.4	10.4	17.96	7.58	48.2	0.03	109.3	117	420
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	6	9.4	10.6	17.34	7.58	47.6	0.03	109.7	111	422
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	5	10.4	10.5	17.07	7.49	47.8	0.03	108.6	112	426
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	4	11.4	10.5	16.78	7.31	47.6	0.03	107.3	55	430
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	3	12.4	9.92	16.17	7.08	47	0.03	100.5	100	435
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	2	13.4	8.85	14.16	6.8	46.8	0.03	85.9	117	440
Windy Bay Shallow	2998	ASBH	7/20/98	10:30	6	1	14.4	7.95	11.31	6.61	46.4	0.03	72.4	238	444
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	17	0.4	8.85	23.46	7.74	55.6	0.04	103.6	21	383
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	16	0.9	8.85	23.46	7.75	55.5	0.04	103.6	39	383
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	15	1.9	8.86	23.42	7.74	55.6	0.04	103.7	54	385
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	14	2.9	8.86	23.4	7.7	55.5	0.04	103.6	35	387
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	13	3.9	8.85	23.37	7.67	55.5	0.04	103.5	104	391
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	12	4.9	8.85	23.37	7.66	55.5	0.04	103.4	105	392
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	11	5.9	8.85	23.33	7.64	55.4	0.04	103.4	114	395
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	10	6.9	8.85	23.31	7.6	55.4	0.04	103.3	57	398
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	9	7.9	8.91	22.92	7.5	54.7	0.04	103.3	104	403
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	8	8.9	9.09	22.02	7.39	53.6	0.03	103.5	122	407

Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	7	9.9	9.28	20.27	7.23	50.9	0.03	102.2	122	414
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	6	10.9	9.69	16.98	7.06	48.1	0.03	99.9	101	420
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	5	11.9	9.83	14.71	6.95	47.1	0.03	96.5	102	424
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	4	12.9	8.9	13.37	6.78	47	0.03	84.8	115	430
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	3	13.9	8.24	12.62	6.65	47.2	0.03	77.2	101	434
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	2	14.9	8.24	11.49	6.6	46.9	0.03	75.2	59	435
Windy Bay Shallow	3298	DBAS	8/10/98	9:29:19	7.9	1	15.9	7.59	10.59	6.53	48	0.03	67.8	226	438
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	22	0.3	9.11	21.99	7.78	55.7	0.04	104	123	345
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	21	1.5	9.09	21.79	7.81	55.5	0.04	103.4	131	346
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	20	2.2	9.19	21.3	7.83	55.5	0.04	103.6	157	346
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	19	3	9.2	21.18	7.82	55.6	0.04	103.4	119	347
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	18	3.7	9.2	21.09	7.81	55.6	0.04	103.2	150	349
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	17	4.5	9.19	21.04	7.78	55.6	0.04	103.1	48	350
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	16	5.2	9.18	20.98	7.76	55.7	0.04	102.8	111	351
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	15	6	9.15	20.97	7.72	55.3	0.04	102.4	122	352
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	14	6.7	9.13	20.95	7.72	55.1	0.04	102.2	100	351
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	13	7.5	9.11	20.9	7.68	55.6	0.04	101.8	207	352
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	12	8.2	9.12	20.86	7.66	55.3	0.04	101.9	136	353
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	11	9	9.06	20.84	7.59	55.1	0.04	101.2	57	356
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	10	9.7	8.91	20.62	7.46	55.3	0.04	99.1	113	359
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	8	10.5	8.49	20.15	7.29	54.9	0.04	93.5	154	363
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	7	11.2	9.51	17.23	7.08	49.4	0.03	98.8	147	369
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	6	12	9.7	15.97	7.07	47.5	0.03	98.1	140	369
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	5	12.7	9.79	15.57	7.07	47.1	0.03	98.1	240	368
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	4	13.5	9.85	15.01	7.03	46.6	0.03	97.6	150	368
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	3	14.2	8.71	14.41	6.88	47.6	0.03	85.1	126	370
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	2	15	8.17	13.71	6.85	47.9	0.03	78.7	221	369
Windy Bay Shallow	3498	DTAS	8/24/98	12:44:32	9	1	15.7	8.39	13.46	6.92	46.9	0.03	80.3	116	365
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	17	0.3	9.07	21.51	7.79	55.7	0.04	102.9	28	336
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	16	1.2	9.07	21.48	7.79	55.7	0.04	102.8	50	336
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	15	2.2	9.07	21.39	7.83	55.6	0.04	102.7	48	334
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	14	3.2	9.08	21.37	7.78	55.5	0.04	102.7	113	337
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	13	4.2	9.08	21.35	7.8	55.6	0.04	102.7	104	336
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	12	5.2	9.09	21.33	7.76	55.6	0.04	102.8	103	339
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	11	6.2	9.08	21.33	7.75	55.6	0.04	102.7	119	339
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	10	7.2	9.1	21.3	7.7	55.4	0.04	102.8	121	343
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	9	8.2	9.1	21.29	7.64	55.7	0.04	102.8	117	346
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	8	9.2	9.07	21.17	7.49	55.5	0.04	102.2	108	353
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	7	10.2	8.53	19.93	7.17	53.5	0.03	93.8	114	363
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	6	11.2	9.17	17.05	6.92	46.9	0.03	95.1	100	371
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	5	12.2	8.61	14.96	6.81	46.5	0.03	85.4	114	373
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	4	13.2	8.52	13.46	6.73	45.8	0.03	81.8	122	376

Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	3	14.2	7.79	12.25	6.62	45.9	0.03	72.8	141	379
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	2	15.2	7.39	11.21	6.55	46.3	0.03	67.4	130	382
Windy Bay Shallow	3598	DTAS	9/2/98	13:02:24	8.2	1	16.2	6.13	11.11	6.49	46.5	0.03	55.8	856	383
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	16	0.2	9.32	18	7.7	54.9	0.04	98.2	151	348
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	15	1.1	9.27	18.1	7.75	57.7	0.04	98	49	349
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	14	2.1	9.27	18.03	7.73	57.8	0.04	97.8	47	350
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	13	3.1	9.26	17.98	7.69	58.1	0.04	97.7	52	353
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	12	4.1	9.28	17.95	7.69	58.1	0.04	97.8	35	352
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	11	5.1	9.26	17.95	7.67	58.1	0.04	97.6	53	354
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	10	6.1	9.26	17.95	7.66	57.7	0.04	97.5	33	354
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	9	7.1	9.26	17.93	7.66	57.8	0.04	97.5	53	354
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	8	8.1	9.26	17.93	7.65	58.2	0.04	97.5	103	354
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	7	9.1	9.25	17.93	7.63	57.7	0.04	97.4	38	356
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	6	10.1	9.24	17.91	7.63	57.6	0.04	97.3	50	356
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	5	11.1	9.23	17.91	7.61	57.9	0.04	97.2	129	356
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	4	12.1	9.23	17.9	7.57	57.9	0.04	97.1	114	358
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	3	13.1	9.18	17.86	7.5	58.2	0.04	96.5	108	359
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	2	14.1	9.15	17.74	7.42	58.8	0.04	96	102	363
Windy Bay Shallow	3998	ASKB	9/30/98	11:21:17	8.5	1	15.1	8.18	16.38	7.19	56.7	0.04	83.4	17	368
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	16	0.4	9.33	13.06	7.41	53.4	0.03	87.5	29	347
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	15	1	9.31	13.04	7.4	53.4	0.03	87.4	36	348
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	14	2	9.34	13.02	7.44	53.4	0.03	87.6	39	346
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	13	3	9.36	13.02	7.41	53.3	0.03	87.8	39	348
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	12	4	9.33	13.01	7.4	53.4	0.03	87.5	26	349
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	11	5	9.36	12.99	7.42	53.4	0.03	87.7	21	347
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	10	6	9.34	12.99	7.41	53.2	0.03	87.5	51	348
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	9	7	9.35	12.97	7.4	53.2	0.03	87.5	48	348
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	8	8	9.34	12.96	7.39	53.2	0.03	87.5	34	348
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	7	9	9.34	12.96	7.39	53.1	0.03	87.5	38	348
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	6	10	9.34	12.94	7.4	53.5	0.03	87.4	34	347
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	5	11	9.35	12.94	7.39	53.2	0.03	87.5	37	347
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	4	12	9.34	12.94	7.39	53.5	0.03	87.4	44	347
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	3	13	9.35	12.94	7.38	53.1	0.03	87.5	39	347
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	2	14	9.34	12.94	7.38	53.4	0.03	87.4	114	346
Windy Bay Shallow	4298	DTASKB	10/20/98	10:40:14	7.1	1	15	9.33	12.92	7.37	53.5	0.03	87.3	311	351
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	15	0.5	8.61	10.05	7.31	53.3	0.03	75.9	52	375
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	14	1.5	8.6	10.07	7.33	53.4	0.03	75.8	42	375
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	13	2.5	8.6	10.07	7.32	53.3	0.03	75.8	37	375
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	12	3.5	8.59	10.07	7.3	53.2	0.03	75.7	111	376
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	11	4.5	8.6	10.07	7.31	53.2	0.03	75.8	46	375
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	10	5.5	8.59	10.07	7.3	53.2	0.03	75.7	50	376

Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	9	6.5	8.59	10.07	7.29	53.1	0.03	75.7	49	376
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	8	7.6	8.59	10.07	7.27	53	0.03	75.7	41	378
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	7	8.5	8.59	10.05	7.29	53.1	0.03	75.7	36	377
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	6	9.5	8.58	10.04	7.3	53.3	0.03	75.6	36	376
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	5	10.5	8.58	10.02	7.29	53.5	0.03	75.5	36	377
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	4	11.5	8.58	10.02	7.29	53.1	0.03	75.5	37	377
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	3	12.5	8.57	10.02	7.3	53.3	0.03	75.4	105	377
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	2	13.4	8.56	9.99	7.29	53.2	0.03	75.3	35	377
Windy Bay Shallow	4598	KB AS	11/12/98	11:22:39	8	1	14.5	8.55	9.73	7.31	53.8	0.03	74.7	1114	377

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	16	0.3	13.02	3.89	7	52.1	0.03	98.2	55	394
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	15	1.2	13.11	3.74	7.05	52	0.03	98.5	215	396
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	14	3.2	13.19	3.73	7.04	52	0.03	99.1	131	398
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	13	5.2	13.18	3.73	7.02	52.1	0.03	99	213	398
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	12	7.2	13.12	3.69	7.01	52.2	0.03	98.5	139	398
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	11	9.2	13.14	3.69	7.03	52.1	0.03	98.6	147	395
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	10	11.2	13.12	3.74	7.02	52.2	0.03	98.7	205	395
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	9	13.2	13.14	3.69	6.98	52.2	0.03	98.6	335	397
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	8	15.2	13.13	3.71	6.99	52.1	0.03	98.6	224	394
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	7	17.2	13.16	3.71	7	52.1	0.03	98.8	133	392
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	6	19.2	13.12	3.69	6.95	52.1	0.03	98.5	129	393
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	5	21.2	13.1	3.73	6.93	52.1	0.03	98.5	136	393
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	4	23.2	13.1	3.78	6.93	52.2	0.03	98.6	224	391
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	3	25.2	13.15	3.79	6.92	52.1	0.03	99	142	389
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	2	27.2	13.17	3.86	6.91	52.1	0.03	99.3	139	388
Windy Bay Deep	1098	DBRP	3/13/98	11:09:06	2.5	1	29.2	13.29	3.83	6.87	52.3	0.03	100.1	137	388
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	15	0.5	12.87	5.77	7.06	51.5	0.03	102.9	201	421
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	14	2.5	12.92	5.64	7.01	51.5	0.03	102.9	246	425
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	13	4.6	12.82	5.49	7.05	51.6	0.03	101.7	200	423
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	12	6.5	12.76	5.36	7.08	51.6	0.03	100.9	102	420
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	11	8.6	12.68	5.29	7.03	51.5	0.03	100	103	422
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	10	10.5	12.68	5.08	6.99	51.6	0.03	99.5	115	423
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	9	12.5	12.63	5.04	7	51.7	0.03	99.1	217	422
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	8	14.6	12.67	5.01	7.02	52	0.03	99.3	206	420
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	7	16.6	12.65	4.91	6.97	52.1	0.03	98.8	100	421
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	6	18.5	12.65	4.76	6.96	52.1	0.03	98.5	117	421
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	5	20.6	12.64	4.76	6.99	52.1	0.03	98.4	133	418
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	4	22.5	12.64	4.71	6.99	52.4	0.03	98.3	116	417
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	3	24.5	12.6	4.71	6.96	52.3	0.03	98	110	417
Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	2	26.5	12.46	4.69	6.96	52.8	0.03	96.8	141	415

Windy Bay Deep	1498	DBAS	4/8/98	11:26:34	3	1	28.5	12.46	4.69	6.96	53	0.03	96.8	217	413
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	15	0.3	12.4	6.79	6.97	48.5	0.03	103.1	43	444
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	14	1.4	12.3	6.59	7.03	48.4	0.03	101.8	58	441
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	13	3.4	12.22	6.81	6.99	48.4	0.03	101.7	100	443
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	12	5.5	12.27	6.63	6.98	48.4	0.03	101.6	49	444
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	11	7.7	12.3	6.56	6.95	48.5	0.03	101.7	125	445
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	10	9.6	12.27	6.33	6.95	48.4	0.03	100.8	138	444
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	9	11.8	12.21	6.13	6.92	48.5	0.03	99.9	150	445
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	8	13.8	12.12	5.85	6.89	48.9	0.03	98.5	122	446
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	7	15.8	11.96	5.34	6.8	50	0.03	95.9	110	449
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	6	17.7	11.96	5.17	6.8	50.1	0.03	95.4	107	449
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	5	19.6	11.98	4.88	6.8	50.1	0.03	94.9	133	449
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	4	21.6	11.98	4.79	6.77	50.2	0.03	94.6	139	450
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	3	23.7	11.95	4.78	6.77	50.1	0.03	94.4	240	450
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	2	25.7	12.02	4.78	6.75	50.2	0.03	94.9	109	450
Windy Bay Deep	1698	DBASRP	4/23/98	8:48:30	3.1	1	27.7	12.02	4.78	6.71	50.1	0.03	94.9	346	451
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	16	0.3	11.7	10.53	7.21	42	0.03	105.9	53	412
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	15	2.3	11.67	10.48	7.2	42.1	0.03	105.6	105	411
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	14	4.3	11.64	10.43	7.17	42.1	0.03	105.2	133	412
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	13	6.3	11.62	10.35	7.16	42.1	0.03	104.7	201	411
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	12	8.3	11.41	9.76	7.1	43	0.03	101.4	9	410
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	11	10.3	11.44	9.4	7.03	43.5	0.03	100.8	153	411
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	10	12.3	11.4	8.68	6.9	44.7	0.03	98.7	227	416
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	9	14.3	11.4	8.61	6.92	44.8	0.03	98.6	244	413
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	8	16.3	11.12		6.85	45.9	0.03	94.6	153	412
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	7	18.3	11.35	7.14	6.79	47.3	0.03	94.6	137	415
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	6	20.3	11.28	6.94	6.82	47.7	0.03	93.6	124	411
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	5	22.3	11.29	6.69	6.81	48	0.03	93.1	119	411
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	4	24.3	11.19	6.61	6.72	48.1	0.03	92.1	159	414
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	3	26.3	11.05	6.23	6.7	48.8	0.03	90.1	118	412
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	2	28.3	11.05	6.15	6.65	49	0.03	89.9	427	414
Windy Bay Deep	2198	JLDTAS	5/26/98	11:37	3.4	1	30.3	11.12	6.18	6.65	48.9	0.03	90.6	227	411
Windy Bay Deep	2398	DTJLAS	6/8/98	11:07:23	4.2	11	0.4	10.91	17.52	7.78	43.9	0.03	113.5	52	399
Windy Bay Deep	2398	DTJLAS	6/8/98	11:07:23	4.2	10	2.6	11.07	16.07	7.73	43.4	0.03	112.4	54	403
Windy Bay Deep	2398	DTJLAS	6/8/98	11:07:23	4.2	9	5.6	11.06	15.49	7.66	43.5	0.03	110.9	100	406
Windy Bay Deep	2398	DTJLAS	6/8/98	11:07:23	4.2	8	8.6	11.12	15.28	7.62	43.5	0.03	111.1	105	407
Windy Bay Deep	2398	DTJLAS	6/8/98	11:07:23	4.2	7	11.6	11.55	13.87	7.62	43.1	0.03	111.8	128	408
Windy Bay Deep	2398	DTJLAS	6/8/98	11:07:23	4.2	6	14.6	11.15	12.04	7.28	43.4	0.03	103.6	203	416
Windy Bay Deep	2398	DTJLAS	6/8/98	11:07:23	4.2	5	17.6	10.83	9.74	7.1	44.3	0.03	95.3	204	420
Windy Bay Deep	2398	DTJLAS	6/8/98	11:07:23	4.2	4	20.6	10.7	8.61	7.04	45	0.03	91.6	151	421
Windy Bay Deep	2398	DTJLAS	6/8/98	11:07:23	4.2	3	23.6	10.64	8.22	7.02	46.6	0.03	90.3	117	421

Windy Bay Deep	2398	DTJLAS	6/8/98	11:07:23	4.2	2	26.6	10.59	7.63	6.99	48.2	0.03	88.5	115	421
Windy Bay Deep	2398	DTJLAS	6/8/98	11:07:23	4.2	1	29.6	10.11	8.1	7	47.8	0.03	85.6	216	432
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	12	0.5	10.5	18.17	8.02	43.4	0.03	112	126	391
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	11	1.5	10.55	18.05	7.99	43.3	0.03	112.2	115	395
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	10	4.5	11.1	15.86	7.88	42.4	0.03	112.8	124	400
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	9	7.5	10.78	14.43	7.46	41.8	0.03	106.2	212	409
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	8	10.5	10.49	12.94	7.21	41.3	0.03	100	143	415
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	7	13.5	10.22	10.81	7.04	41.1	0.03	92.7	244	418
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	6	16.5	9.88	8.37	6.9	43.5	0.03	84.6	212	421
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	5	19.5	10.12	7.43	6.89	45.7	0.03	84.7	53	422
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	4	22.5	10.18	7.15	6.89	46.2	0.03	84.6	46	422
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	3	25.5	10.25	6.89	6.9	46.7	0.03	84.6	206	422
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	2	28.5	10.24	6.71	6.9	47.2	0.03	84.1	207	421
Windy Bay Deep	2598	DTASBH	6/24/98	11:43:39	4.5	1	31.5	9.98	6.71	6.91	47.4	0.03	82	455	421
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	16	0.5	9.56	21.94	7.83	47.3	0.03	109	105	330
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	15	2.2	9.66	21.06	7.91	47.1	0.03	108.3	142	326
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	14	4.2	10.07	20.47	7.97	46.3	0.03	111.6	216	326
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	13	6.2	10.77	18.6	8.23	44.8	0.03	115	205	323
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	12	8.2	10.98	17.36	8.23	44.2	0.03	114.2	138	325
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	11	10.2	10.37	15.91	7.57	43.2	0.03	104.6	225	338
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	10	12.2	9.1	13.02	6.97	41.7	0.03	86.2	155	348
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	9	14.2	9.06	10.18	6.83	41.1	0.03	80.4	135	349
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	8	16.2	9.07	9.32	6.81	41.8	0.03	78.8	142	348
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	7	18.2	9	8.47	6.78	43.2	0.03	76.6	133	347
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	6	20.2	9.06	8.25	6.78	43.5	0.03	76.8	208	345
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	5	22.2	9.35	7.7	6.79	44.7	0.03	78.1	131	343
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	4	24.2	9.67	6.96	6.78	46	0.03	79.4	104	342
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	3	26.2	9.38	6.66	6.76	47	0.03	76.4	128	340
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	2	28.2	9.36	6.48	6.76	47.4	0.03	75.9	144	339
Windy Bay Deep	2798	ASDNBH	7/8/98	9:49:41	4.5	1	30.2	9.38	6.48	6.77	47.4	0.03	76.1	416	336
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	17	0.4	9.39	21.93	7.86	51.8	0.03	106.9	50	372
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	16	1	9.45	21.62	7.88	51.5	0.03	107	110	373
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	15	3	9.75	20.66	7.9	50.2	0.03	108.4	107	373
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	14	5	9.71	20.05	7.89	49.6	0.03	106.6	113	375
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	13	7	10.12	19.22	7.77	49.2	0.03	109.3	101	378
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	12	9	10.44	16.9	7.54	47.6	0.03	107.5	112	384
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	11	11	10.19	15.36	7.23	46.2	0.03	101.5	103	390
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	10	13	9.24	13.45	6.94	45.5	0.03	88.3	221	394
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	9	15	8.53	10.76	6.76	45.2	0.03	76.6	50	397
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	8	17	8.54	9.56	6.71	46	0.03	74.6	55	397
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	7	19	8.85	9.06	6.72	46.4	0.03	76.3	104	396

Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	6	21	8.48	8.81	6.72	47.2	0.03	72.7	117	395
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	5	23	8.89	8.22	6.75	47.9	0.03	75.2	105	394
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	4	25	9.29	7.43	6.77	49.7	0.03	77	51	394
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	3	27	9.27	6.9	6.77	50.7	0.03	75.8	122	393
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	2	29	9.35	6.67	6.79	51	0.03	76	204	392
Windy Bay Deep	2998	ASBH	7/20/98	10:06:45	8.2	1	31	8.76	7.22	6.83	51.3	0.03	72.2	315	393
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	16	0.4	8.78	23.55	7.81	57.5	0.04	103	42	362
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	15	1.8	8.8	23.5	7.8	57.5	0.04	103.1	46	364
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	14	3.9	8.86	23.27	7.81	58.2	0.04	103.4	121	365
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	13	5.8	8.89	23.17	7.76	57.9	0.04	103.5	116	367
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	12	7.8	8.87	23.12	7.67	57.7	0.04	103.1	128	371
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	11	9.9	9.98	19.39	7.36	49.6	0.03	108	108	379
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	10	11.8	9.98	14.05	6.96	46.8	0.03	96.6	100	389
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	9	13.8	9.01	12.02	6.8	46.3	0.03	83.2	128	391
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	8	15.8	8.34	10.49	6.7	46.6	0.03	74.4	110	393
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	7	17.8	7.77	9.1	6.63	48.1	0.03	67	104	394
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	6	19.8	8.22	8.17	6.65	49.3	0.03	69.4	114	393
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	5	21.8	8.76	7.61	6.69	49.8	0.03	72.9	117	391
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	4	23.8	8.89	7.07	6.69	51.4	0.03	73	123	391
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	3	25.8	8.69	6.79	6.69	51.8	0.03	70.8	125	389
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	2	27.8	8.21	6.64	6.68	52.4	0.03	66.7	101	387
Windy Bay Deep	3298	DBAS	8/10/98	9:53:02	8.8	1	29.8	7.72	7.04	6.7	53.6	0.03	63.3	252	385
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	16	0.9	9.13	21.8	7.8	53.4	0.03	104.1	116	355
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	15	2.9	9.21	21.41	7.8	53.6	0.03	104.2	55	359
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	14	4.9	9.18	21.38	7.76	53.6	0.03	103.8	46	360
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	13	6.9	9.19	21.31	7.69	53.4	0.03	103.7	48	364
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	12	8.9	9.18	21.22	7.59	52.8	0.03	103.4	37	368
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	11	10.9	9.04	20.76	7.45	52.7	0.03	101	200	373
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	10	12.9	9.49	15.33	6.93	45.1	0.03	94.8	142	387
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	9	14.9	8.71	12.04	6.74	44.2	0.03	80.9	126	392
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	8	16.9	7.48	9.99	6.59	45.9	0.03	66.3	113	395
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	7	18.9	7.5	9.15	6.57	45.8	0.03	65.1	110	396
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	6	20.9	7.64	8.42	6.57	46.6	0.03	65.2	126	396
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	5	22.9	8.13	7.97	6.58	46.9	0.03	68.6	228	395
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	4	24.9	8.54	7.28	6.59	48.1	0.03	70.8	301	395
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	3	26.9	8.47	7.02	6.57	48.5	0.03	69.8	226	395
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	2	28.9	8.27	6.71	6.54	49.4	0.03	67.6	142	396
Windy Bay Deep	3498	ASDNGL	8/24/98	13:50:30	9	1	30.9	7.93	7.15	6.54	48.7	0.03	65.5	820	401
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	16	0.3	9.07	21.96	7.89	56.1	0.04	103.7	31	336
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	15	2.2	9.05	21.55	7.79	55.8	0.04	102.7	44	342
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	14	4.2	9.08	21.41	7.79	55.9	0.04	102.8	51	343

Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	13	6.2	9.08	21.36	7.74	55.9	0.04	102.7	54	347
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	12	8.2	9.04	21.25	7.6	55.8	0.04	102	110	353
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	11	10.2	8.76	20.59	7.22	55	0.04	97.6	54	366
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	10	12.2	9.24	13.72	6.81	46	0.03	89.2	115	376
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	9	14.2	7.86	11.48	6.65	45.5	0.03	72.1	111	380
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	8	16.2	7.26	9.94	6.56	46.6	0.03	64.2	110	382
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	7	18.2	7.4	8.96	6.57	46.9	0.03	64	122	381
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	6	20.2	7.67	8.13	6.56	48.2	0.03	65	109	381
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	5	22.2	8.12	7.66	6.58	49.1	0.03	68	103	381
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	4	24.2	8.23	7.35	6.57	49.3	0.03	68.4	53	381
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	3	26.2	8.31	7.05	6.57	50	0.03	68.6	158	381
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	2	28.2	7.92	6.76	6.54	51	0.03	64.9	122	382
Windy Bay Deep	3598	DTAS	9/2/98	10:03:06	8.7	1	30.2	7.39	7.08	6.54	50.5	0.03	61	606	382
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	16	0.5	9.27	18.28	7.7	57.5	0.04	98.3	111	347
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	15	2.9	9.29	18	7.69	57.3	0.04	98	121	348
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	14	4.9	9.29	17.97	7.66	57.5	0.04	98	130	351
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	13	6.9	9.27	17.95	7.63	57.8	0.04	97.7	109	352
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	12	8.9	9.27	17.88	7.58	57.8	0.04	97.5	121	354
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	11	10.9	9.25	17.87	7.52	58.2	0.04	97.3	152	356
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	10	12.9	9.12	17.85	7.33	57.6	0.04	95.9	140	363
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	9	14.9	6.72	12.6	6.64	47.7	0.03	63.1	122	377
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	8	16.9	6.29	9.92	6.6	48.5	0.03	55.5	141	377
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	7	18.9	6.58	9.01	6.59	48.8	0.03	56.8	157	377
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	6	20.9	7.02	8.48	6.62	49.2	0.03	59.8	153	375
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	5	22.9	7.6	7.88	6.64	49.7	0.03	63.8	142	374
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	4	24.9	7.87	7.63	6.66	49.8	0.03	65.6	143	373
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	3	26.9	7.92	6.92	6.65	51	0.03	64.9	135	373
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	2	28.8	7.26	6.73	6.63	51.8	0.03	59.2	124	372
Windy Bay Deep	3998	ASKB	9/30/98	12:07:00	10	1	30.9	6.89	6.76	6.63	52	0.03	56.3	549	374
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	16	0.4	9.2	13.14	7.36	53.3	0.03	86.5	41	353
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	15	2.3	9.18	13.12	7.36	53.3	0.03	86.3	31	354
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	14	4.3	9.18	13.06	7.33	53.1	0.03	86.2	30	356
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	13	6.3	9.18	13.06	7.31	53.3	0.03	86.2	35	357
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	12	8.3	9.19	13.04	7.31	53.1	0.03	86.2	34	357
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	11	10.3	9.17	13.02	7.3	53.3	0.03	86	46	358
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	10	12.3	9.17	13.02	7.26	52.9	0.03	86	30	359
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	9	14.3	9.15	13.02	7.24	52.9	0.03	85.8	32	360
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	8	16.3	9.14	12.99	7.2	53.1	0.03	85.6	34	361
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	7	18.3	9.03	13.01	7.1	52.9	0.03	84.6	54	364
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	6	20.3	6.75	11.54	6.67	49.1	0.03	61.2	40	370
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	5	22.3	6.13	9.69	6.6	47.2	0.03	53.2	113	370
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	4	24.3	6.89	8.2	6.62	46.8	0.03	57.7	53	369

Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	3	26.3	7.02	7.63	6.62	47.3	0.03	57.9	53	369
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	2	28.3	7.14	7.24	6.63	47.7	0.03	58.3	50	367
Windy Bay Deep	4298	DTASKB	10/20/98	11:14:13	9	1	30.3	7.05	7.04	6.64	48.2	0.03	57.4	113	367
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	16	0.4	8.51	10.2	7.28	53.2	0.03	75.2	37	377
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	15	1.4	8.5	10.2	7.28	53.1	0.03	75.1	53	377
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	14	3.5	8.47	10.22	7.23	53.3	0.03	74.9	108	379
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	13	5.5	8.49	10.2	7.23	52.9	0.03	75	114	379
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	12	7.5	8.47	10.22	7.18	52.9	0.03	74.9	104	381
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	11	9.5	8.46	10.22	7.14	53.2	0.03	74.8	46	382
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	10	11.5	8.46	10.22	7.13	53.1	0.03	74.8	50	382
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	9	13.5	8.45	10.23	7.08	53.1	0.03	74.8	104	383
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	8	15.5	8.4	10.2	6.98	53.8	0.03	74.3	145	385
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	7	17.4	6.04	8.55	6.6	50.9	0.03	51.3	147	391
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	6	19.5	6.07	7.4	6.56	48.4	0.03	50.1	115	391
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	5	21.5	5.94	7.04	6.55	48.4	0.03	48.6	104	392
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	4	23.5	5.71	6.99	6.54	49	0.03	46.7	51	391
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	3	25.5	5.68	6.97	6.55	49	0.03	46.4	32	391
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	2	27.7	5.74	6.92	6.55	48.9	0.03	46.9	112	391
Windy Bay Deep	4598	KB AS	11/12/98	11:44:00	8.6	1	29.5	5.69	6.92	6.56	48.8	0.03	46.5	1828	390

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
CDA River	1098	DBRP	3/13/98	11:54:53	2	18	0.4	13.07	4.76	6.9	58.3	0.04	100.9	59	395
CDA River	1098	DBRP	3/13/98	11:54:53	2	17	1	13.08	4.72	6.9	58.3	0.04	100.9	51	396
CDA River	1098	DBRP	3/13/98	11:54:53	2	16	1.5	13.08	4.66	6.9	57.8	0.04	100.7	50	397
CDA River	1098	DBRP	3/13/98	11:54:53	2	15	2	13.09	4.54	6.91	57	0.04	100.5	42	396
CDA River	1098	DBRP	3/13/98	11:54:53	2	14	2.5	13.08	4.49	6.9	58.2	0.04	100.3	50	396
CDA River	1098	DBRP	3/13/98	11:54:53	2	13	3	13.09	4.41	6.93	57.5	0.04	100.1	40	394
CDA River	1098	DBRP	3/13/98	11:54:53	2	12	3.5	13.09	4.44	6.94	57.4	0.04	100.3	57	393
CDA River	1098	DBRP	3/13/98	11:54:53	2	11	4	13.08	4.44	6.94	58	0.04	100.2	104	393
CDA River	1098	DBRP	3/13/98	11:54:53	2	10	4.5	13.11	4.44	6.92	57.9	0.04	100.4	122	393
CDA River	1098	DBRP	3/13/98	11:54:53	2	9	5	13.14	4.51	6.9	60.9	0.04	100.8	105	393
CDA River	1098	DBRP	3/13/98	11:54:53	2	8	5.5	13.14	4.47	6.87	61.4	0.04	100.7	103	393
CDA River	1098	DBRP	3/13/98	11:54:53	2	7	6	13.14	4.38	6.88	61.5	0.04	100.4	44	392
CDA River	1098	DBRP	3/13/98	11:54:53	2	6	6.5	13.09	4.43	6.86	61.7	0.04	100.2	121	393
CDA River	1098	DBRP	3/13/98	11:54:53	2	5	7	13.14	4.47	6.82	61.7	0.04	100.7	102	393
CDA River	1098	DBRP	3/13/98	11:54:53	2	4	7.5	13.15	4.44	6.83	62	0.04	100.7	108	392
CDA River	1098	DBRP	3/13/98	11:54:53	2	3	8	13.2	4.46	6.77	62.1	0.04	101.1	52	394
CDA River	1098	DBRP	3/13/98	11:54:53	2	2	8.5	13.22	4.49	6.77	62.1	0.04	101.4	102	393
CDA River	1098	DBRP	3/13/98	11:54:53	2	1	9	13.25	4.39	6.76	63.3	0.04	101.3	151	392

CDA River	1498	DBAS	4/8/98	13:19:28	3.2	10	0.3	12.28	7.14	7.04	43.5	0.03	101.6	110	411
CDA River	1498	DBAS	4/8/98	13:19:28	3.2	9	1.6	12.23	7.04	7.01	43.6	0.03	100.9	139	414
CDA River	1498	DBAS	4/8/98	13:19:28	3.2	8	2.6	12.26	6.96	6.99	43.6	0.03	100.9	111	415
CDA River	1498	DBAS	4/8/98	13:19:28	3.2	7	3.6	12.26	7.04	7.04	43.5	0.03	101.2	118	413
CDA River	1498	DBAS	4/8/98	13:19:28	3.2	6	4.6	12.26	6.96	6.93	43.6	0.03	100.9	140	418
CDA River	1498	DBAS	4/8/98	13:19:28	3.2	5	5.6	12.23	6.96	6.99	43.7	0.03	100.7	110	415
CDA River	1498	DBAS	4/8/98	13:19:28	3.2	4	6.6	12.23	6.87	6.98	43.9	0.03	100.5	109	415
CDA River	1498	DBAS	4/8/98	13:19:28	3.2	3	7.6	12.23	6.86	6.95	44	0.03	100.4	56	415
CDA River	1498	DBAS	4/8/98	13:19:28	3.2	2	8.6	12.23	6.84	6.95	43.9	0.03	100.4	100	415
CDA River	1498	DBAS	4/8/98	13:19:28	3.2	1	9.6	12.24	6.78	6.93	44.4	0.03	100.3	407	415
CDA River	1698	DBASRP	4/23/98	12:46:10	2.3	11	0.1	11.53	12.99	7.01	47.1	0.03	107.6	57	376
CDA River	1698	DBASRP	4/23/98	12:46:10	2.3	10	1.3	11.68	10.12	7.04	49.1	0.03	102.1	53	373
CDA River	1698	DBASRP	4/23/98	12:46:10	2.3	9	2.3	11.7	9.56	6.98	50.3	0.03	100.9	42	374
CDA River	1698	DBASRP	4/23/98	12:46:10	2.3	8	3.3	11.72	9.49	6.91	50.3	0.03	100.9	34	377
CDA River	1698	DBASRP	4/23/98	12:46:10	2.3	7	4.3	11.65	9.35	6.89	50.2	0.03	99.9	53	377
CDA River	1698	DBASRP	4/23/98	12:46:10	2.3	6	5.3	11.54	8.28	6.82	49.8	0.03	96.5	51	378
CDA River	1698	DBASRP	4/23/98	12:46:10	2.3	5	6.2	11.5	7.46	6.8	48.4	0.03	94.3	108	378
CDA River	1698	DBASRP	4/23/98	12:46:10	2.3	4	7.2	11.39	7.02	6.75	48.5	0.03	92.3	107	378
CDA River	1698	DBASRP	4/23/98	12:46:10	2.3	3	8.2	11.3	6.59	6.77	47.9	0.03	90.6	59	375
CDA River	1698	DBASRP	4/23/98	12:46:10	2.3	2	9.3	11.35	6.08	6.73	48.5	0.03	89.8	109	375
CDA River	1698	DBASRP	4/23/98	12:46:10	2.3	1	10.3	11.42	5.67	6.7	49.4	0.03	89.4	207	374
CDA River	2198	ASJLDT	5/26/98	12:34:22	3.5	11	0.3	11.07	11.13	7.03	40.5	0.03	101.7	42	395
CDA River	2198	ASJLDT	5/26/98	12:34:22	3.5	10	1.8	11.08	11.15	6.98	40.5	0.03	101.8	49	397
CDA River	2198	ASJLDT	5/26/98	12:34:22	3.5	9	2.8	11.05	11.12	6.98	40.4	0.03	101.5	103	396
CDA River	2198	ASJLDT	5/26/98	12:34:22	3.5	8	3.8	11.04	11.05	7.06	39.9	0.03	101.2	112	389
CDA River	2198	ASJLDT	5/26/98	12:34:22	3.5	7	4.8	11.01	11	7	40	0.03	100.9	119	390
CDA River	2198	ASJLDT	5/26/98	12:34:22	3.5	6	5.8	10.99	10.94	7.02	40.2	0.03	100.5	55	386
CDA River	2198	ASJLDT	5/26/98	12:34:22	3.5	5	6.8	10.98	10.68	6.92	42.7	0.03	99.7	120	390
CDA River	2198	ASJLDT	5/26/98	12:34:22	3.5	4	7.8	11.03	10.58	6.89	44	0.03	100	128	389
CDA River	2198	ASJLDT	5/26/98	12:34:22	3.5	3	8.8	11.09	10.12	6.85	49.1	0.03	99.4	57	387
CDA River	2198	ASJLDT	5/26/98	12:34:22	3.5	2	9.8	10.99	9.66	6.76	49.5	0.03	97.5	118	389
CDA River	2198	ASJLDT	5/26/98	12:34:22	3.5	1	10.8	11.14	8.47	6.78	44.5	0.03	96	200	387
CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	12	0.3	10.65	17.18	7.58	42.6	0.03	110.7	129	399
CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	11	1.1	10.75	16.19	7.55	42.9	0.03	109.5	118	403
CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	10	2.1	10.85	15.56	7.54	42.9	0.03	109	113	405
CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	9	3.1	10.92	14.96	7.52	42.2	0.03	108.3	56	407
CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	8	4.1	10.85	14.86	7.49	43.4	0.03	107.4	150	408
CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	7	5.1	10.84	14.56	7.38	49.4	0.03	106.6	119	412
CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	6	6.1	10.6	13.98	7.25	53.8	0.03	102.9	115	416
CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	5	7.1	10.64	13.63	7.21	55.1	0.04	102.5	49	417
CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	4	8.1	10.64	13.4	7.22	53.1	0.03	102	115	417

CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	3	9.1	10.68	12.94	7.25	44.1	0.03	101.3	119	415
CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	2	10.1	10.76	12.43	7.24	41.4	0.03	100.8	132	415
CDA River	2398	DTJLAS	6/8/98	11:39:46	3.6	1	11.1	10.57	11.58	7.2	40.8	0.03	97.2	244	416
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	12	0.6	9.81	19.83	7.59	45.2	0.03	107.9	46	385
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	11	1.9	9.98	18.92	7.6	47.1	0.03	107.7	46	387
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	10	2.9	10.01	18.85	7.59	47.2	0.03	107.9	33	388
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	9	3.9	10	18.85	7.56	47.3	0.03	107.8	105	390
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	8	4.9	10.58	17.54	7.46	62	0.04	111	53	395
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	7	5.9	10.4	16.69	7.36	50.3	0.03	107.2	50	395
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	6	6.9	10.44	15.79	7.33	45.2	0.03	105.6	50	396
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	5	7.9	10.5	15.54	7.28	48	0.03	105.6	112	397
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	4	8.9	10.49	14.86	7.21	47.1	0.03	104	54	399
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	3	9.9	10.46	14.74	7.15	48.1	0.03	103.4	42	400
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	2	10.9	10.32	14.16	7.08	48.3	0.03	100.8	126	401
CDA River	2598	DTASJL	6/23/98	13:30:13	5.4	1	11.9	9.96	12.44	6.94	42.5	0.03	93.6	29	407
CDA River	2798	ASDNBH	7/8/98	10:29:22	5.4	11	0.4	9.23	22.99	7.87	50.4	0.03	107.4	126	324
CDA River	2798	ASDNBH	7/8/98	10:29:22	5.4	10	1.4	9.26	22.92	7.96	51.2	0.03	107.5	112	319
CDA River	2798	ASDNBH	7/8/98	10:29:22	5.4	9	2.4	9.26	22.45	7.89	52.2	0.03	106.6	133	321
CDA River	2798	ASDNBH	7/8/98	10:29:22	5.4	8	3.4	9.59	21.86	7.9	56.9	0.04	109.1	129	322
CDA River	2798	ASDNBH	7/8/98	10:29:22	5.4	7	4.4	9.52	21.39	7.81	48.4	0.03	107.4	100	322
CDA River	2798	ASDNBH	7/8/98	10:29:22	5.4	6	5.4	10.51	19.06	7.87	54.2	0.03	113.3	208	322
CDA River	2798	ASDNBH	7/8/98	10:29:22	5.4	5	6.4	10.68	17.95	7.92	47.6	0.03	112.5	201	320
CDA River	2798	ASDNBH	7/8/98	10:29:22	5.4	4	7.4	10.64	16.93	7.72	45.5	0.03	109.8	112	323
CDA River	2798	ASDNBH	7/8/98	10:29:22	5.4	3	8.4	10.45	16.19	7.54	44.1	0.03	106.2	138	325
CDA River	2798	ASDNBH	7/8/98	10:29:22	5.4	2	9.4	10.16	15.96	7.41	43.8	0.03	102.7	153	326
CDA River	2798	ASDNBH	7/8/98	10:29:22	5.4	1	10.4	9.81	16.09	7.3	43.3	0.03	99.4	550	327
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	12	0.3	9.01	23.86	7.85	54.8	0.04	106.4	47	333
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	11	1.3	9.05	23.6	7.87	55	0.04	106.3	108	332
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	10	2.3	9.13	23.37	7.89	59.5	0.04	106.8	51	333
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	9	3.3	9.15	23.29	7.88	63.1	0.04	106.9	56	333
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	8	4.3	9.05	23.08	7.81	63.3	0.04	105.2	57	336
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	7	5.3	8.94	22.31	7.59	65.3	0.04	102.5	34	339
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	6	6.3	10.21	19.61	7.9	49.5	0.03	111.1	141	335
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	5	7.3	10.35	18.9	7.87	48.8	0.03	111	102	334
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	4	8.3	10.54	18.25	7.76	48.3	0.03	111.6	108	338
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	3	9.3	9.66	16.91	7.21	48.7	0.03	99.4	110	346
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	2	10.3	9.16	14.81	7.06	46.3	0.03	90.2	138	347
CDA River	2998	ASBH	7/20/98	10:55:07	4.6	1	11.3	8.12	13.91	6.95	46.4	0.03	78.4	244	347
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	13	0.3	8.62	24.59	7.71	64.6	0.04	103.1	47	343
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	12	1	8.67	24.09	7.73	64.6	0.04	102.7	46	342

CDA River	3298	DBAS	8/10/98	10:52:11	6.6	11	1.9	8.7	23.84	7.71	65.5	0.04	102.6	27	343
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	10	2.8	8.7	23.82	7.71	65.9	0.04	102.5	44	343
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	9	3.7	8.71	23.78	7.71	65.5	0.04	102.6	102	343
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	8	4.8	8.72	23.76	7.7	66.2	0.04	102.7	37	344
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	7	5.7	8.73	23.75	7.67	67.3	0.04	102.8	36	345
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	6	6.7	8.73	23.75	7.64	68.5	0.04	102.8	47	346
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	5	7.7	8.17	23.53	7.44	71	0.05	95.8	125	351
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	4	8.7	9.57	19.38	7.33	50.7	0.03	103.6	42	353
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	3	9.8	9.75	18.95	7.33	50	0.03	104.6	50	353
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	2	10.8	9.69	17.86	7.28	49	0.03	101.6	132	353
CDA River	3298	DBAS	8/10/98	10:52:11	6.6	1	11.8	9.14	16.86	7.21	48.7	0.03	93.9	206	354
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	13	0.2	9.13	22.93	7.93	57.7	0.04	106.4	34	331
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	12	1	9.17	22.29	7.96	57.5	0.04	105.5	42	330
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	11	2	9.26	21.83	7.95	57.7	0.04	105.6	51	332
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	10	3	9.24	21.76	7.91	58.6	0.04	105.2	107	333
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	9	4	9.24	21.7	7.9	59.2	0.04	105.1	116	333
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	8	5	9.24	21.65	7.87	59.8	0.04	105	118	333
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	7	6	9.23	21.6	7.85	59.2	0.04	104.8	108	334
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	6	7	9.19	21.48	7.73	62.3	0.04	104.1	55	338
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	5	8	9.01	21.39	7.59	70	0.04	101.9	29	342
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	4	9	8.9	21.26	7.5	80.4	0.05	100.4	107	345
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	3	10	8.8	21.09	7.33	85.9	0.06	98.9	118	350
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	2	11	8.74	16.59	6.82	47	0.03	89.8	114	357
CDA River	3498	ASDNGL	8/25/98	11:44:46	7	1	11.6	7.89	16.04	6.78	46.2	0.03	80	737	358
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	12	0.3	9.2	22.43	7.96	59.9	0.04	106.2	101	323
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	11	1.3	9.23	21.99	7.9	61	0.04	105.6	47	327
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	10	2.3	9.05	21.55	7.75	69.5	0.04	102.7	47	333
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	9	3.3	8.95	21.46	7.72	73.7	0.05	101.5	112	334
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	8	4.3	9.13	21.39	7.82	64.4	0.04	103.4	47	330
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	7	5.3	9.21	21.37	7.87	60.3	0.04	104.2	51	329
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	6	6.3	9.2	21.32	7.84	59.6	0.04	104	122	330
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	5	7.3	9.23	21.3	7.81	59.2	0.04	104.3	130	331
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	4	8.3	9.15	21.25	7.62	59.6	0.04	103.2	51	338
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	3	9.3	9.06	21.21	7.41	60.4	0.04	102.2	100	345
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	2	10.3	7.94	19.4	6.96	56.1	0.04	86.4	118	356
CDA River	3598	DTAS	9/2/98	11:23:48	7.1	1	11.3	7.74	17.32	6.87	48.7	0.03	80.8	759	356
CDA River	3998	ASKB	9/30/98	12:55:00	7.4	11	0.3	9.24	18.73	7.76	62.9	0.04	98.9	52	335
CDA River	3998	ASKB	9/30/98	12:55:00	7.4	10	1.9	9.28	18.08	7.77	63	0.04	98	104	336
CDA River	3998	ASKB	9/30/98	12:55:00	7.4	9	2.9	9.29	18.05	7.75	63.5	0.04	98.1	133	338
CDA River	3998	ASKB	9/30/98	12:55:00	7.4	8	3.9	9.32	18.03	7.75	65.3	0.04	98.4	108	338
CDA River	3998	ASKB	9/30/98	12:55:00	7.4	7	4.9	9.34	17.98	7.73	65.1	0.04	98.5	119	339

CDA River	3998	ASKB	9/30/98	12:55:00	7.4	6	5.9	9.33	17.9	7.7	66	0.04	98.2	123	340
CDA River	3998	ASKB	9/30/98	12:55:00	7.4	5	7	9.32	17.83	7.63	72.4	0.05	98	107	343
CDA River	3998	ASKB	9/30/98	12:55:00	7.4	4	7.9	9.26	17.62	7.57	74.8	0.05	96.9	104	345
CDA River	3998	ASKB	9/30/98	12:55:00	7.4	3	8.9	9.23	17.52	7.53	78.2	0.05	96.4	140	345
CDA River	3998	ASKB	9/30/98	12:55:00	7.4	2	9.9	8.96	17.37	7.45	87.7	0.06	93.2	135	347
CDA River	3998	ASKB	9/30/98	12:55:00	7.4	1	10.9	8.85	17.32	7.39	89.7	0.06	92.1	818	353
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	12	0.4	9.37	12.45	7.36	58.5	0.04	86.8	34	357
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	11	0.8	9.38	12.43	7.38	58.5	0.04	86.8	30	356
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	10	1.8	9.36	12.43	7.38	58.6	0.04	86.6	44	356
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	9	2.8	9.36	12.41	7.34	58.6	0.04	86.5	39	358
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	8	3.8	9.34	12.4	7.34	58.3	0.04	86.4	30	357
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	7	4.8	9.26	12.37	7.32	58.3	0.04	85.6	46	357
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	6	5.8	9.23	12.3	7.31	59	0.04	85.1	47	356
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	5	6.8	9.23	12.2	7.3	59.2	0.04	85	31	356
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	4	7.8	9.36	11.84	7.3	61.3	0.04	85.4	42	356
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	3	8.8	9.51	11.4	7.27	66.5	0.04	86	30	356
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	2	9.8	9.63	11.17	7.25	68.4	0.04	86.5	26	354
CDA River	4298	DTASKB	10/20/98	9:51:12	7.1	1	10.8	9.73	10.63	7.22	74.3	0.05	86.3	218	353
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	12	0.3	8.53	9.55	7.37	57.2	0.04	74.3	30	340
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	11	1	8.51	9.55	7.33	57.3	0.04	74.1	43	342
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	10	2	8.52	9.55	7.36	57.4	0.04	74.2	38	340
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	9	3	8.53	9.55	7.33	57.7	0.04	74.3	42	341
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	8	4	8.52	9.55	7.31	57.6	0.04	74.2	46	342
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	7	5	8.51	9.53	7.3	57.8	0.04	74.1	46	343
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	6	6	8.55	9.43	7.3	58.6	0.04	74.2	42	342
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	5	7	8.53	9.46	7.28	58.2	0.04	74.1	112	343
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	4	8	8.65	9.07	7.3	63.1	0.04	74.4	119	340
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	3	9	8.74	8.68	7.28	66.5	0.04	74.5	101	339
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	2	9.9	9.21	6.91	7.22	88.4	0.06	75.2	307	339
CDA River	4598	KB AS	11/12/98	12:34:00	5.5	1	11	9.23	6.99	7.21	90	0.06	81.1	9	342

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	18	0.5	12.84	4.14	6.84	44.3	0.01	149.5	4	375
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	17	1.6	12.87	3.98	7.01	44.3	0.03	97.3	115	392
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	16	2.6	12.79	3.79	6.96	44.3	0.03	96.3	116	395
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	15	3.6	12.79	3.84	7	44.1	0.03	96.4	108	392
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	14	4.6	12.83	3.89	6.89	44.3	0.03	96.8	121	398
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	13	5.6	12.79	3.86	6.96	44.3	0.03	96.5	53	392
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	12	6.6	12.78	3.76	6.92	44.5	0.03	96.1	102	395
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	11	7.6	12.78	3.76	6.99	44.4	0.03	96.1	126	390

Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	10	8.6	12.8	3.76	7	44.5	0.03	96.2	50	389
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	9	9.6	12.77	3.78	6.96	44.3	0.03	96.1	111	391
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	8	10.6	12.77	3.79	6.94	44.4	0.03	96.2	114	391
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	7	11.6	12.76	3.79	6.96	44.5	0.03	96.1	159	389
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	6	12.6	12.79	3.78	6.95	44.6	0.03	96.2	120	389
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	5	13.6	12.79	3.79	6.88	44.6	0.03	96.3	107	391
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	4	14.6	12.79	3.78	6.9	44.6	0.03	96.2	109	390
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	3	15.7	12.74		6.9	44.5	0.03	96	146	388
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	2	16.6	12.73	3.83	6.87	44.6	0.03	95.9	135	388
Mid Lake CDA	1098	DBRP	3/13/98	12:25:26	1.9	1	17.6	12.77	3.83	6.88	44.7	0.03	96.2	227	387
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	19	0.5	12.45	8.56	7.14	39.4	0.03	106.7	111	410
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	18	1.5	12.41	8.15	7.08	39.1	0.03	105.2	133	415
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	17	2.5	12.6	7.6	7.08	39.2	0.03	105.4	126	416
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	16	3.5	12.56	7.12	7.08	39	0.02	103.8	39	415
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	15	4.6	12.48	7.02	7.02	39	0.02	102.9	110	417
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	14	5.5	12.31	6.99	7.06	39.1	0.03	101.5	141	415
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	13	6.4	12.3	6.91	7.02	39.2	0.03	101.2	112	416
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	12	7.4	12.21	6.66	6.96	39.3	0.03	99.8	103	418
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	11	8.6	12.24	6.61	6.92	39.4	0.03	99.9	109	419
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	10	9.5	12.21	6.53	6.94	39.5	0.03	99.5	113	417
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	9	10.5	12.05	6.3	6.94	39.9	0.03	97.6	121	416
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	8	11.6	12.03	6.23	6.9	39.9	0.03	97.3	135	417
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	7	12.5	12.02	5.97	6.88	39.8	0.03	96.6	121	417
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	6	13.6	12.02	5.8	6.83	40.9	0.03	96.1	225	419
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	5	14.5	12.08	5.64	6.9	42.7	0.03	96.2	119	415
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	4	15.5	12	5.59	6.87	43	0.03	95.4	202	415
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	3	16.5	11.95	5.57	6.87	43.2	0.03	95	103	414
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	2	17.5	11.51	5.46	6.84	43.9	0.03	91.2	129	414
Mid Lake CDA	1498	DBAS	4/8/98	13:44:51	2.2	1	18.5	11.51	5.46	6.82	44	0.03	91.2	358	414
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	13	0.3	12.01	11.69	7.24	42.7	0.03	110.3	52	396
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	12	1.5	12.01	9.63	7.19	42.2	0.03	105.1	113	402
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	11	3	12.12	8.58	7.13	42.1	0.03	103.4	109	405
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	10	4.4	12	7.32	7.04	43.1	0.03	99.3	55	405
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	9	6	11.88	6.69	6.95	45	0.03	96.8	103	409
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	8	7.4	11.88	6.53	6.93	46.2	0.03	96.4	133	409
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	7	9	11.9	6.36	6.88	47.1	0.03	96.2	112	410
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	6	10.5	11.87	6.31	6.88	47.2	0.03	95.8	154	409
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	5	12	11.87	6.2	6.91	47.7	0.03	95.5	130	406
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	4	13.5	11.82	6.15	6.91	48.2	0.03	95	134	405
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	3	15	11.72	6	6.82	47.8	0.03	93.8	124	407
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	2	16.6	11.62	5.42	6.87	49.9	0.03	91.7	144	402
Mid Lake CDA	1698	DBASRP	4/21/98	14:41:39	2.7	1	18.2	11.21	5.36	6.83	51	0.03	88.3	235	404

Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	13	0.3	11.17	11.95	7.17	35	0.02	104.5	49	382
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	12	2	11.16	11.89	7.17	35.5	0.02	104.3	54	382
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	11	3.5	11.13	11.43	7.06	36.8	0.02	102.9	40	384
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	10	5	11.12	11.13	7.08	34.5	0.02	102.1	50	381
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	9	6.5	11.12	11.1	7.07	34.2	0.02	102.1	129	379
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	8	8	11.15	10.97	7.04	33.5	0.02	102	113	378
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	7	9.5	11.05	9.76	6.96	35.5	0.02	98.2	102	378
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	6	11	11.18	8.96	6.86	40.7	0.03	97.5	119	381
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	5	12.5	11.22	8.45	6.88	43.3	0.03	96.7	111	377
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	4	14	11.19	7.92	6.8	44.8	0.03	95.1	140	378
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	3	15.5	11.09	7.32	6.77	46.5	0.03	92.9	152	375
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	2	17	11.05	7.1	6.74	47.1	0.03	92.1	145	369
Mid Lake CDA	2198	ASJLDT	5/26/98	12:58:43	3.4	1	18.8	10.3	6.26	6.61	49	0.03	84	156	366
Mid Lake CDA	2398	DTJLAS	6/8/98	12:11:07	2.9	11	0.4	10.86	16.72	7.61	38.6	0.02	111.9	49	375
Mid Lake CDA	2398	DTJLAS	6/8/98	12:11:07	2.9	10	1.5	11.02	15.73	7.6	38.7	0.02	111.1	110	376
Mid Lake CDA	2398	DTJLAS	6/8/98	12:11:07	2.9	9	3	10.94	15.39	7.51	39.2	0.03	109.5	103	379
Mid Lake CDA	2398	DTJLAS	6/8/98	12:11:07	2.9	8	5	10.96	13.09	7.32	37.7	0.02	104.3	110	382
Mid Lake CDA	2398	DTJLAS	6/8/98	12:11:07	2.9	7	7	10.97	12.5	7.26	41.8	0.03	103	114	385
Mid Lake CDA	2398	DTJLAS	6/8/98	12:11:07	2.9	6	9	10.97	12.28	7.2	41.9	0.03	102.5	33	384
Mid Lake CDA	2398	DTJLAS	6/8/98	12:11:07	2.9	5	11	10.88	11.5	7.17	36.7	0.02	99.8	121	383
Mid Lake CDA	2398	DTJLAS	6/8/98	12:11:07	2.9	4	13	10.87	10.77	7.11	35.9	0.02	98.1	50	383
Mid Lake CDA	2398	DTJLAS	6/8/98	12:11:07	2.9	3	15	10.54	8.92	7.02	39.9	0.03	91	118	385
Mid Lake CDA	2398	DTJLAS	6/8/98	12:11:07	2.9	2	17	10.01	7.69	6.92	46.5	0.03	83.9	125	386
Mid Lake CDA	2398	DTJLAS	6/8/98	12:11:07	2.9	1	19	9.63	8.04	6.92	47	0.03	81.3	236	383
Mid Lake CDA	2598	DTJLAS	6/23/98	14:06:28	5	11	0.2	9.91	19.71	7.53	45.7	0.03	108.7	49	417
Mid Lake CDA	2598	DTJLAS	6/23/98	14:06:28	5	10	1	9.97	19.06	7.54	46	0.03	107.9	102	423
Mid Lake CDA	2598	DTJLAS	6/23/98	14:06:28	5	9	3	10.62	17.15	7.49	48	0.03	110.5	53	428
Mid Lake CDA	2598	DTJLAS	6/23/98	14:06:28	5	8	5	10.88	15.76	7.44	52.7	0.03	110	48	431
Mid Lake CDA	2598	DTJLAS	6/23/98	14:06:28	5	7	7	10.84	14.86	7.35	46.3	0.03	107.5	118	434
Mid Lake CDA	2598	DTJLAS	6/23/98	14:06:28	5	6	9	10.84	14.47	7.24	46.1	0.03	106.6	47	438
Mid Lake CDA	2598	DTJLAS	6/23/98	14:06:28	5	5	11	10.88	13.81	7.16	45.8	0.03	105.4	102	440
Mid Lake CDA	2598	DTJLAS	6/23/98	14:06:28	5	4	13	10.72	12.31	6.97	43.8	0.03	100.5	100	446
Mid Lake CDA	2598	DTJLAS	6/23/98	14:06:28	5	3	15	9.99	10.51	6.79	43	0.03	89.7	130	450
Mid Lake CDA	2598	DTJLAS	6/23/98	14:06:28	5	2	17	9.14	8.46	6.65	46.4	0.03	78.2	131	454
Mid Lake CDA	2598	DTJLAS	6/23/98	14:06:28	5	1	19	8.81	8.02	6.59	47.9	0.03	74.5	152	457
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	20	0.4	9.49	24.64	8.03	50.7	0.03	113.5	100	337
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	19	1	9.48	23.4	7.92	50.5	0.03	110.8	203	343
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	18	2	10.36	19.56	7.89	50.4	0.03	112.5	126	345
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	17	3	10.67	18.5	8.03	50.7	0.03	113.4	114	343
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	16	4	11.01	17.51	8.34	49.4	0.03	114.6	149	338

Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	15	5	11	16.75	8.11	49.3	0.03	112.8	122	343
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	14	6	10.95	16.58	8.08	48.3	0.03	111.9	124	344
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	13	7	10.92	16.53	8.07	47.8	0.03	111.5	115	346
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	12	8	10.76	16.27	7.8	47.5	0.03	109.2	112	352
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	11	9	10.42	15.61	7.48	46.7	0.03	104.3	105	356
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	10	10	10.23	14.91	7.27	46.6	0.03	100.9	117	359
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	9	11	10.21	14.72	7.24	46.6	0.03	100.3	223	359
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	8	12	9.93	14.03	7.08	45.5	0.03	96	136	361
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	7	13.1	9.53	12.84	6.93	44.3	0.03	89.8	122	362
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	6	14	9.24	12.07	6.89	43.2	0.03	85.5	53	362
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	5	15	8.96	10.85	6.77	43.8	0.03	80.6	113	362
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	4	16	8.85	10.46	6.75	43.9	0.03	78.9	123	362
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	3	17	8.66	9.72	6.72	45.4	0.03	75.9	118	361
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	2	18	7.82	8.76	6.64	47.2	0.03	66.9	145	360
Mid Lake CDA	2798	DTASBH	7/7/98	13:23:07	5.6	1	19	7.73	8.71	6.66	47.5	0.03	66.1	315	357
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	20	0.4	9.47	23.5	8.11	46.3	0.03	111.2	39	325
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	19	1	9.41	22.88	7.97	46.3	0.03	109.3	102	330
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	18	2	9.42	21.74	7.83	46.3	0.03	107	59	332
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	17	3	10.25	19.88	8.08	47.1	0.03	112.3	101	329
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	16	4	10.8	18.07	8.37	44.4	0.03	114.1	51	325
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	15	5	10.93	17.13	8.38	43.1	0.03	113.2	110	325
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	14	6	10.95	17.08	8.29	43.9	0.03	113.3	121	328
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	13	7	10.9	16.95	8.16	44.4	0.03	112.4	128	331
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	12	8	10.7	16.63	8.01	43.8	0.03	109.7	111	335
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	11	9	10.58	16.23	7.71	43.6	0.03	107.6	56	341
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	10	10	10.47	15.96	7.6	43.1	0.03	105.8	116	343
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	9	11	10.32	15.42	7.42	43	0.03	103.1	122	346
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	8	12	10.18	15.12	7.3	42.5	0.03	101	116	348
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	7	13	9.77	14.1	7.11	41.5	0.03	94.8	152	351
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	6	14	9.44	13.12	6.98	40.4	0.03	89.7	205	352
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	5	15	8.86	11.99	6.85	39.2	0.03	82	217	353
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	4	16	8.41	11.25	6.77	39.2	0.03	76.5	154	353
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	3	17	7.92	10.48	6.71	39.7	0.03	70.8	215	352
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	2	18	7.29	8.63	6.62	43.9	0.03	62.4	146	352
Mid Lake CDA	2798	ASDNBH	7/8/98	11:24:33	5.6	1	19	7.25	8.59	6.63	43.9	0.03	62	555	351
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	19	0.3	9.18	24.55	7.93	54.1	0.03	109.8	56	334
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	18	1.8	9.26	23.15	7.9	53.6	0.03	107.8	134	334
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	17	2.8	9.35	22.64	7.9	53.7	0.03	107.9	123	335
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	16	3.8	9.68	22.09	7.97	53.3	0.03	110.5	219	335
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	15	4.8	9.98	20.97	8.02	51.4	0.03	111.5	125	336
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	14	5.8	10.2	19.95	8.01	50.1	0.03	111.7	125	337
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	13	6.8	10.52	18.74	7.85	49	0.03	112.5	155	342

Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	12	7.8	10.08	16.31	7.27	47.5	0.03	102.5	135	354
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	11	8.8	9.14	13.96	6.94	45.8	0.03	88.3	121	359
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	10	9.8	8.59	12.87	6.8	45	0.03	81	111	361
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	9	10.8	8.6	11.7	6.76	44.9	0.03	79	139	360
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	8	11.8	8.44	11.21	6.73	45.2	0.03	76.6	151	360
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	7	12.8	8.37	10.84	6.71	45.4	0.03	75.4	157	359
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	6	13.8	8.3	10.05	6.67	46	0.03	73.4	155	358
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	5	14.8	7.79	9.28	6.63	47.2	0.03	67.6	128	357
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	4	15.8	7.75	8.97	6.63	47.3	0.03	66.7	32	356
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	3	16.8	8.21	8.74	6.68	47.9	0.03	70.3	55	351
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	2	17.8	8.42	8.72	6.71	47.8	0.03	72	22	349
Mid Lake CDA	2998	ASBH	7/20/98	11:13:27	8.7	1	18.8	8.49	8.66	6.77	47.9	0.03	72.6	222	343
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	13	0.3	8.5	24.59	7.73	59	0.04	101.6	48	343
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	12	1.9	8.56	23.87	7.73	58.8	0.04	101	39	343
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	11	3.4	8.59	23.64	7.71	59.1	0.04	100.9	49	343
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	10	4.9	8.7	23.49	7.7	58.8	0.04	102	110	344
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	9	6.6	8.7	23.4	7.62	59.2	0.04	101.8	104	347
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	8	7.8	9.57	20.65	7.39	52.7	0.03	106.2	54	355
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	7	9.8	10.06	19.06	7.33	49.8	0.03	108.1	46	356
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	6	11.1	9.85	17.61	7.12	48.5	0.03	102.8	25	361
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	5	12.4	9.14	15.99	6.95	47.8	0.03	92.2	103	365
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	4	14.1	7.96	12.74	6.76	47	0.03	74.8	108	368
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	3	15.4	7.03	11.16	6.69	47.7	0.03	63.7	46	368
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	2	17.1	6.06	9.58	6.66	49.1	0.03	52.9	56	368
Mid Lake CDA	3298	DBAS	8/10/98	11:21:08	9.8	1	18.8	4.84	10.07	6.71	50.9	0.03	42.7	130	369
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	20	0.3	9.16	22.36	7.92	56	0.04	105.6	105	334
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	19	1	9.25	21.95	7.98	55.3	0.04	105.7	107	334
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	18	2	9.25	21.78	7.96	55.3	0.04	105.4	113	337
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	17	3	9.25	21.54	7.92	55.2	0.04	104.9	100	336
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	16	4	9.24	21.46	7.87	55.3	0.04	104.6	102	338
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	15	5	9.25	21.39	7.82	55.3	0.04	104.6	44	339
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	14	6	9.19	21.33	7.79	55.4	0.04	103.8	56	340
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	13	7	9.14	21.4	7.73	55.1	0.04	103.4	51	343
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	12	8	9.13	21.32	7.58	55.3	0.04	103.1	28	349
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	11	9	9.04	20.84	7.34	53.5	0.03	101.1	113	355
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	10	10	9.31	19.37	7.11	49.2	0.03	101.2	115	361
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	9	11	8.07	16.51	6.82	45.9	0.03	82.7	107	368
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	8	12	7.71	14.82	6.73	45.6	0.03	76.2	152	370
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	7	13	6.98	13.2	6.63	44.8	0.03	66.6	224	372
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	6	14	6.93	11.79	6.54	45.6	0.03	64	30	374
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	5	15	6.46	10.72	6.5	46	0.03	58.2	37	375
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	4	16	6.34	9.9	6.48	46.5	0.03	56.1	123	375

Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	3	17	6.02	9.59	6.47	46.4	0.03	52.8	132	374
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	2	18	6.5	9.18	6.48	46.8	0.03	56.5	223	373
Mid Lake CDA	3498	ASDNGL	8/25/98	12:13:57	7.5	1	18.8	6.2	9.08	6.47	47.2	0.03	53.7	408	372
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	19	0.5	9.21	21.94	7.9	58.3	0.04	105.3	14	330
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	18	1.8	9.33	21.39	7.94	57.9	0.04	105.6	15	330
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	17	2.8	9.3	21.28	7.87	58.1	0.04	105	28	333
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	16	3.8	9.27	21.23	7.82	58.2	0.04	104.6	28	335
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	15	4.8	9.29	21.18	7.78	58.1	0.04	104.7	29	337
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	14	5.8	9.26	21.16	7.69	58.2	0.04	104.3	34	342
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	13	6.8	9.17	21.11	7.52	57.7	0.04	103.2	32	347
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	12	7.8	8.72	20.41	7.15	55.8	0.04	96.8	33	359
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	11	8.8	8.5	18.7	6.97	49.8	0.03	91.2	49	362
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	10	9.8	7.98	17.41	6.82	47.4	0.03	83.4	46	366
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	9	10.8	8.18	15.41	6.77	47	0.03	81.9	114	368
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	8	11.8	7.44	13.53	6.65	46.7	0.03	71.5	55	370
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	7	12.8	6.77	12.22	6.56	46.9	0.03	63.2	121	372
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	6	13.8	7.14	11.38	6.56	46.8	0.03	65.4	111	372
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	5	14.8	6.76	10.87	6.53	47.3	0.03	61.1	139	372
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	4	15.8	6.15	9.84	6.45	48.1	0.03	54.3	108	374
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	3	16.8	6.07	9.74	6.44	48	0.03	53.4	49	374
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	2	17.8	5.78	9.71	6.43	48.1	0.03	50.9	115	374
Mid Lake CDA	3598	DTAS	9/2/98	13:11:01	7.5	1	18.8	5.36	9.46	6.41	48.6	0.03	46.9	1017	374
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	19	0.3	9.25	18.94	7.77	61.1	0.04	99.5	34	335
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	18	1.6	9.31	18.05	7.77	61.1	0.04	98.3	40	338
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	17	2.6	9.28	17.93	7.74	61.1	0.04	97.7	102	340
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	16	3.6	9.29	17.86	7.73	60.8	0.04	97.7	55	340
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	15	4.6	9.23	17.84	7.71	60.8	0.04	97.1	51	341
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	14	5.6	9.21	17.81	7.68	60.7	0.04	96.8	124	343
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	13	6.6	9.19	17.76	7.63	61	0.04	96.5	132	345
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	12	7.6	9.17	17.73	7.56	62.5	0.04	96.1	52	348
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	11	8.6	9.09	17.58	7.53	62.6	0.04	95.1	102	348
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	10	9.6	9.1	17.54	7.5	63.6	0.04	95.1	105	350
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	9	10.6	9.1	17.54	0	64	0.04	95.1	100	351
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	8	11.6	9.06	17.49	7.42	64.4	0.04	94.5	156	353
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	7	12.6	8.37	16.92	7.09	64.6	0.04	86.3	108	363
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	6	13.6	7.35	15.38	6.82	57.8	0.04	73.4	115	368
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	5	14.6	5.53	13.04	6.58	49.5	0.03	52.4	124	373
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	4	15.6	4.79	11.81	6.54	49.6	0.03	44.1	119	374
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	3	16.6	4.51	10.09	6.51	49.9	0.03	39.9	154	375
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	2	17.6	3.75	9.48	6.48	50.7	0.03	32.7	246	375
Mid Lake CDA	3998	ASKB	9/30/98	13:31:00	5.9	1	18.6	4.07	9.33	6.5	51.1	0.03	35.4	831	373

Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	19	0.4	9.11	12.65	7.32	57.5	0.04	84.7	59	385
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	18	1.3	9.12	12.66	7.31	57.7	0.04	84.8	42	387
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	17	2.3	9.11	12.66	7.32	57.7	0.04	84.7	119	387
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	16	3.3	9.1	12.66	7.29	57.7	0.04	84.6	129	390
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	15	4.3	9.11	12.63	7.32	57.4	0.04	84.7	109	388
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	14	5.3	9.1	12.63	7.31	57.7	0.04	84.6	53	389
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	13	6.3	9.11	12.6	7.3	57.7	0.04	84.6	117	389
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	12	7.3	9.13	12.56	7.3	57	0.04	84.7	59	390
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	11	8.3	9.11	12.58	7.3	57.3	0.04	84.5	131	390
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	10	9.3	9.13	12.55	7.3	56.8	0.04	84.7	47	390
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	9	10.3	9.13	12.55	7.29	57.3	0.04	84.7	57	391
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	8	11.3	9.07	12.55	7.27	57.3	0.04	84.1	51	392
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	7	12.3	9.03	12.5	7.26	56.6	0.04	83.6	124	392
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	6	13.3	8.98	12.46	7.22	56.7	0.04	83.1	104	393
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	5	14.3	8.76	11.81	7.17	56.7	0.04	79.9	151	395
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	4	15.3	7.23	11.2	6.91	55.1	0.04	65.1	215	399
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	3	16.3	4.21	10.12	6.56	50.9	0.03	36.9	152	409
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	2	17.3	5.14	8.73	6.48	49.2	0.03	43.6	315	411
Mid Lake CDA	4298	DTASKB	10/20/98	9:38:00	7.5	1	18.3	5.42	8.09	6.5	49.1	0.03	45.3	357	410
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	19	0.4	8.58	8.78	7.31	54.7	0.04	74.6	31	324
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	18	0.9	8.58	8.79	7.33	54.8	0.04	74.6	38	323
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	17	1.9	8.58	8.79	7.31	54.8	8.57	325	47	11.3
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	16	2.9	8.55	8.78	7.28	54.8	0.04	74.3	111	325
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	15	3.9	8.57	8.78	7.27	55	0	8.56	58	4
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	14	4.9	8.52	8.78	7.23	55.2	0.04	74	41	327
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	13	5.9	8.52	8.79	7.22	54.7	0.04	74.1	40	327
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	12	6.9	8.48	8.78	7.19	55.3	0.04	73.7	43	327
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	11	7.9	8.3	8.74	7.14	55.3	0.04	72.1	53	329
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	10	8.9	8.19	8.71	7.1	55.4	0.04	71	43	329
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	9	9.9	8.19	8.69	7.09	55.7	0.04	71.1	55	329
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	8	10.9	8.04	8.69	7.05	55.7	0.04	69.7	39	329
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	7	11.9	7.87	8.66	6.99	56	0.04	69.1	25	331
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	6	12.9	7.49	8.48	6.89	55.6	0.04	64.6	42	331
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	5	13.9	7.14	8.3	6.83	54.7	0.04	61.3	42	331
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	4	14.9	7.11	8.2	6.82	54.2	0.03	60.9	54	331
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	3	16	6.95	8.06	6.77	53.8	0.03	59.4	50	330
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	2	16.9	6.37	7.7	6.72	50.9	0.03	53.9	59	330
Mid Lake CDA	4698	KBAS	11/17/98	13:20:00	5.3	1	17.9	6.07	7.45	6.71	49.5	0.03	51	505	328

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	12	0.4	12.8	5.07	6.92	44.8	0.03	99.4	104	391

Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	11	0.8	12.7	4.74	6.9	44.6	0.03	98.3	37	397
Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	10	1.8	12.8	4.01	6.99	44.8	0.03	96.6	116	392
Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	9	2.8	12.8	4.19	6.93	44.6	0.03	97.2	43	395
Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	8	3.8	12.8	4.14	6.96	44.6	0.03	96.9	57	393
Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	7	4.8	12.8	3.98	6.95	44.7	0.03	96.6	56	393
Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	6	5.8	12.7	3.99	6.99	44.7	0.03	96.4	108	391
Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	5	6.8	12.8	4.01	6.96	44.7	0.03	96.8	110	392
Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	4	7.8	12.8	4.06	6.92	44.7	0.03	96.8	146	393
Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	3	8.8	12.8	3.98	6.86	44.6	0.03	96.5	32	394
Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	2	9.8	12.7	4.04	6.84	46.3	0.03	96.2	121	393
Carey Bay	1098	DBRP	3/13/98	13:01:20	1.8	1	10.8	12.4	3.98	6.75	48.1	0.03	93.4	144	395
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	13	0.3	12.4	7.7	7.04	40.3	0.03	103.8	113	411
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	12	1.2	12.3	7.7	7.02	40.4	0.03	103.4	126	414
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	11	2.3	12.3	7.71	7.03	40.3	0.03	103.3	104	414
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	10	3.3	12.3	7.63	7	40	0.03	103	121	415
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	9	4.3	12.3	7.05	7.06	40.2	0.03	101.4	140	411
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	8	5.4	12.2	6.61	6.93	40.6	0.03	99.6	55	417
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	7	6.4	12.2	6.5	6.87	41	0.03	99.1	107	419
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	6	7.4	12.1	6.45	6.91	40.9	0.03	98.4	116	416
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	5	8.4	11.9	6.13	6.88	42.2	0.03	95.8	139	416
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	4	9.4	11.8	5.97	6.84	42.7	0.03	94.4	115	417
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	3	10.4	11.8	5.85	6.8	42.9	0.03	94.1	125	418
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	2	11.4	11.8	5.75	6.84	43	0.03	94.1	46	415
Carey Bay	1498	DBAS	4/8/98	14:24:27	2.2	1	12.5	11.7	5.75	6.79	43.2	0.03	93.2	203	418
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	13	0.3	11.7	13.63	7.2	43.7	0.03	111.9	120	391
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	12	1.6	12.3	9.86	7.24	43.2	0.03	107.9	108	392
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	11	2.6	12.4	8.22	7.24	42.8	0.03	104.8	105	392
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	10	3.5	12.4	7.78	7.13	42.2	0.03	103.5	50	396
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	9	4.5	12.2	7.42	7.15	42.4	0.03	101.3	115	393
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	8	5.6	12	7.14	7	42.9	0.03	98.8	142	398
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	7	6.6	11.9	6.97	7.03	43.4	0.03	97.4	154	394
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	6	7.7	11.8	6.79	6.95	43.9	0.03	96.5	118	395
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	5	8.6	11.7	6.54	6.96	44.5	0.03	95	210	393
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	4	9.7	11.7	6.13	6.94	45.7	0.03	93.7	116	391
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	3	10.6	11.7	6.08	6.92	46.2	0.03	93.6	131	390
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	2	11.5	11.6	5.9	6.85	47	0.03	92.9	124	391
Carey Bay	1698	DBASRP	4/21/98	15:07:34	2.8	1	12.6	11.6	5.87	6.93	47.4	0.03	92.2	217	385
Carey Bay	2198	ASJLDT	5/26/98	13:24:59	3.9	10	0.3	11.2	11.87	7.19	33.7	0.02	104.6	46	380
Carey Bay	2198	ASJLDT	5/26/98	13:24:59	3.9	9	1	11.2	11.86	7.18	33.7	0.02	104.3	124	380
Carey Bay	2198	ASJLDT	5/26/98	13:24:59	3.9	8	2.5	11.2	11.86	7.13	33.7	0.02	104.4	55	381
Carey Bay	2198	ASJLDT	5/26/98	13:24:59	3.9	7	4	11.2	11.82	7.15	33.9	0.02	104.5	48	379

Carey Bay	2198	ASJLDT	5/26/98	13:24:59	3.9	6	5.5	11.2	11.66	7.14	33.8	0.02	104.1	49	376
Carey Bay	2198	ASJLDT	5/26/98	13:24:59	3.9	5	7	11.2	11.02	7.07	34.1	0.02	102.7	114	377
Carey Bay	2198	ASJLDT	5/26/98	13:24:59	3.9	4	8.5	11.3	10.82	7.06	34.5	0.02	102.8	117	375
Carey Bay	2198	ASJLDT	5/26/98	13:24:59	3.9	3	10	11.2	9.99	6.99	35.9	0.02	100.4	40	374
Carey Bay	2198	ASJLDT	5/26/98	13:24:59	3.9	2	11.5	11.3	9.56	6.9	37.9	0.02	99.6	40	377
Carey Bay	2198	ASJLDT	5/26/98	13:24:59	3.9	1	13	11.2	9.3	6.9	38.8	0.02	98.8	202	375
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	13	0.3	10.9	16.57	7.64	38.5	0.02	112.2	50	375
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	12	1.3	10.9	16.25	7.62	38.5	0.02	111	52	378
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	11	2.3	11.1	14.81	7.6	38.5	0.02	109.8	56	379
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	10	3.3	11.1	14.54	7.55	38.4	0.02	109.4	43	381
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	9	4.3	11.2	14.21	7.49	38.7	0.02	108.7	56	383
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	8	5.3	11.1	13.56	7.4	38.6	0.02	106.8	55	385
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	7	6.3	11.1	13.14	7.34	38.6	0.02	105.5	56	386
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	6	7.3	10.9	12.55	7.25	38.2	0.02	102	41	387
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	5	8.3	10.8	12.45	7.23	37.9	0.02	101.6	57	387
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	4	9.3	10.8	12.14	7.2	37.2	0.02	100.3	109	388
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	3	10.3	10.2	11.58	7.11	37.6	0.02	93.9	58	389
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	2	11.3	10.3	10.86	7.08	37.8	0.02	93.1	58	389
Carey Bay	2398	DTJLAS	6/8/98	12:38:40	3.1	1	12.3	10.2	10.43	7.06	38.6	0.02	91.1	143	391
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	14	0.2	10.1	19.38	7.55	42.7	0.03	110	32	355
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	13	1.6	10.1	19.16	7.54	42.8	0.03	109.2	107	356
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	12	2.6	10.6	16.73	7.58	43.5	0.03	109.4	59	358
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	11	3.6	10.7	16.61	7.59	43.6	0.03	109.7	116	357
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	10	4.6	10.8	16.39	7.6	45.6	0.03	110.8	46	357
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	9	5.6	10.9	16.11	7.6	46.3	0.03	111	108	357
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	8	6.6	10.8	15.86	7.49	46.7	0.03	109	52	359
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	7	7.6	10.8	15.54	7.45	43.6	0.03	108.1	137	359
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	6	8.6	10.9	14.57	7.38	42.6	0.03	107.1	104	359
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	5	9.6	11	13.89	7.33	42.2	0.03	106.1	115	360
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	4	10.6	10.9	13.17	7.23	40.3	0.03	103.7	114	361
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	3	11.6	10.5	12.79	7.15	39.7	0.03	99.6	118	361
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	2	12.6	10.6	12.16	7.13	39.7	0.03	98.7	155	359
Carey Bay	2598	DTASBH	6/22/98	13:41:37	4.3	1	13.6	10	11.29	7.05	38.9	0.02	91.7	129	358
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	13	0.3	9.02	24.79	7.68	51.4	0.03	108.2	200	338
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	12	1.7	10.3	20.18	7.78	51.1	0.03	113.6	103	340
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	11	2.7	10.6	18.99	7.84	50.5	0.03	114	103	339
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	10	3.7	10.7	17.88	7.8	50.5	0.03	112.3	126	341
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	9	4.7	11	17.3	7.96	50.2	0.03	113.5	114	339
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	8	5.7	10.9	17.1	7.81	50.3	0.03	112.3	125	342
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	7	6.7	10.4	16.41	7.54	48.2	0.03	105.6	123	346
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	6	7.7	10.6	16.02	7.53	47.7	0.03	107.1	138	346

Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	5	8.7	10.4	15.67	7.4	47.2	0.03	104	113	347
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	4	9.7	10.3	15.49	7.37	47.2	0.03	103.2	119	347
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	3	10.7	10.2	15.32	7.29	47	0.03	101.6	143	348
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	2	11.7	9.97		7.21	46.2	0.03	98.2	246	348
Carey Bay	2798	DTASBH	7/7/98	12:50:28	5.1	1	12.7	9.41	14.14	7.05	45.9	0.03	91.2	218	348
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	14	0.5	8.93	23.64	7.79	51.7	0.03	105	120	395
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	13	1.5	9.24	22.7	7.86	51.2	0.03	106.7	124	398
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	12	2.5	9.42	22.29	7.95	50.9	0.03	108	102	398
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	11	3.5	10.2	20.83	8.11	48.7	0.03	113.2	152	398
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	10	4.5	10.4	19.82	8.02	47.5	0.03	113.4	110	403
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	9	5.5	10.3	19.75	7.91	47.7	0.03	112.1	135	406
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	8	6.5	10.6	19.06	7.93	46.7	0.03	113.7	51	408
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	7	7.5	10.5	18.58	7.7	46.3	0.03	111.4	204	416
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	6	8.5	10.1	17.69	7.32	45.7	0.03	105.5	44	427
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	5	9.5	9.84	16.27	7.09	45.4	0.03	100	131	431
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	4	10.5	9.27	15.45	6.94	45.1	0.03	92.6	136	434
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	3	11.5	9.16	13.88	6.83	43.5	0.03	88.4	59	438
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	2	12.5	8.32	12.74	6.65	42.9	0.03	78.2	40	445
Carey Bay	2998	ASBH	7/20/98	11:26:44	8.6	1	13.5	7.51	12.15	6.59	42.7	0.03	69.7	252	447
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	14	0.6	8.54	24.09	7.66	58.5	0.04	101.1	52	346
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	13	1.7	8.59	23.62	7.63	58.3	0.04	100.9	49	347
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	12	2.7	8.67	23.42	7.62	57.6	0.04	101.4	40	347
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	11	3.6	8.81	23.13	7.63	57.7	0.04	102.5	124	348
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	10	4.5	8.84	22.99	7.59	57	0.04	102.6	51	350
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	9	5.6	9.06	22.22	7.52	55.6	0.04	103.7	54	353
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	8	6.7	9.38	21.16	7.46	53.2	0.03	105.1	58	355
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	7	7.8	9.63	20.32	7.4	50.8	0.03	106.2	39	356
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	6	8.8	9.61	19.8	7.37	50.7	0.03	104.9	56	357
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	5	9.7	9.69	19.5	7.31	50.4	0.03	105.1	104	358
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	4	10.8	9.59	18.65	7.18	49.5	0.03	102.2	114	361
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	3	11.8	8.84	17.25	6.96	49.2	0.03	91.6	41	366
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	2	12.7	7.87	15.27	6.84	48.4	0.03	78.2	144	368
Carey Bay	3298	DBAS	8/10/98	11:43:00	9.1	1	13.7	6.62	13.55	6.77	48.8	0.03	63.3	23	369
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	14	0.2	9.14	22.49	7.89	55.5	0.04	105.6	101	332
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	13	1.2	9.16	22.49	7.93	55.5	0.04	105.8	101	329
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	12	2.2	9.19	22.4	7.93	55.6	0.04	105.9	40	329
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	11	3.2	9.28	21.85	7.94	55.4	0.04	105.9	56	329
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	10	4.2	9.2	21.72	7.89	55.1	0.04	104.7	52	331
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	9	5.2	9.25	21.55	7.82	55.3	0.04	105	59	333
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	8	6.2	8.89	21.49	7.61	55.3	0.04	100.7	56	339
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	7	7.2	9.04	21.37	7.62	55.3	0.04	102.2	130	339

Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	6	8.2	8.65	21.26	7.33	55.2	0.04	97.6	115	346
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	5	9.2	8.43	19.87	7.06	50.7	0.03	92.6	108	352
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	4	10.2	8.05	18.94	6.96	48.9	0.03	86.8	210	354
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	3	11.2	7.39	16.69	6.77	46.5	0.03	76	125	358
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	2	12.2	5.61	14.03	6.59	47.5	0.03	54.5	128	361
Carey Bay	3498	ASDNGL	8/25/98	13:20:35	6.8	1	13.2	4.67	12.41	6.54	48.5	0.03	43.8	330	362
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	14	0.3	8.96	22.9	7.78	58.7	0.04	104.4	50	300
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	13	1.3	8.98	22.43	7.87	58.6	0.04	103.8	38	296
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	12	2.3	9.23	21.48	7.93	58.7	0.04	104.8	30	295
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	11	3.3	9.21	21.26	7.92	58.4	0.04	104.1	133	296
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	10	4.3	9.23	21.14	7.86	58.4	0.04	104.1	107	297
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	9	5.3	9.25	21.05	7.83	58.4	0.04	104.2	118	297
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	8	6.3	9.19	21.07	7.73	58.3	0.04	103.5	147	300
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	7	7.3	9.06	20.97	7.6	58	0.04	101.8	323	303
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	6	8.3	8.78	20.27	7.17	55.7	0.04	97.3	57	319
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	5	9.3	7.54	19.09	6.9	52.3	0.03	81.7	120	325
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	4	10.3	7.08	16.44	6.76	47.4	0.03	72.6	111	328
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	3	11.3	6.29	15.04	6.65	48.5	0.03	62.6	115	328
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	2	12.3	4.6	11.46	0	49.9	0.03	42.2	204	329
Carey Bay	3598	DTAS	9/3/98	14:16:15	6.8	1	13.3	4.88	11.2	6.57	49.5	0.03	44.6	159	317
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	13	0.3	9.04	19.23	7.66	61.1	0.04	97.8	56	336
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	12	1.9	9.14	17.95	7.62	61	0.04	96.3	44	339
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	11	2.9	9.1	17.76	7.6	61.1	0.04	95.5	53	340
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	10	3.9	9.1	17.76	7.55	61.2	0.04	95.5	111	342
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	9	4.9	8.89	17.61	7.47	60.8	0.04	93	43	344
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	8	5.9	8.82	17.57	7.43	60.7	0.04	92.2	28	346
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	7	6.9	8.81	17.57	7.42	60.9	0.04	92.1	104	345
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	6	8	8.8	17.56	7.39	61.3	0.04	92	53	347
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	5	8.9	8.78	17.56	7.35	60.6	0.04	91.8	112	348
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	4	9.9	8.49	17.51	7.23	60.7	0.04	88.6	34	351
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	3	11	8.13	17.37	7.17	61	0.04	84.7	154	352
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	2	11.9	7.35	16.91	6.98	60	0.04	75.8	128	356
Carey Bay	3998	ASKB	9/30/98	14:15:00	6	1	12.9	5.88	16.12	6.86	57.2	0.04	59.7	636	358
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	13	0.4	9.13	13.25	7.35	58.7	0.04	86.2	30	334
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	12	1.4	9.04	12.99	7.36	58.6	0.04	84.8	245	334
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	11	2.4	9	12.78	7.35	58.6	0.04	84.1	133	333
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	10	3.4	9.02	12.71	7.35	58.4	0.04	84	46	332
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	9	4.4	9	12.68	7.32	58.7	0.04	83.8	49	333
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	8	5.4	8.98	12.68	7.31	58.6	0.04	83.6	39	333
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	7	6.4	8.99	12.68	7.3	58.6	0.04	83.7	42	333
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	6	7.4	8.98	12.66	7.29	58.7	0.04	83.6	35	333

Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	5	8.4	8.93	12.66	7.29	58.6	0.04	83.2	109	332
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	4	9.4	8.94	12.65	7.29	58.2	0.04	83.2	59	330
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	3	10.4	8.92	12.65	7.3	58.8	0.04	83	103	328
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	2	11.4	8.98	12.6	7.3	58.4	0.04	83.5	56	327
Carey Bay	4298	DTASJB	10/19/98	12:57:51	6.2	1	12.4	8.96	12.56	7.3	58.7	0.04	83.2	624	329
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	12	0.6	8.25	8.47	7.21	55	0.04	71.1	26	320
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	11	1.7	8.23	8.45	7.19	54.9	0.04	71	37	321
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	10	2.7	8.2	8.46	7.14	54.9	0.04	70.7	35	323
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	9	3.7	8.19	8.47	7.14	55	0.04	70.6	37	323
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	8	4.7	8.2	8.47	7.14	54.9	0.04	70.7	46	322
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	7	5.7	8.19	8.47	0	55.3	0.04	70.6	115	322
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	6	6.7	8.13	8.45	7.11	54.9	0.04	70.1	103	322
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	5	7.7	8.17	8.45	7.1	55.4	0.04	70.5	51	322
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	4	8.7	8.15	8.45	7.08	54.9	0.04	70.3	130	321
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	3	9.7	7.79	8.3	7.01	54.5	0.03	66.9	57	320
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	2	10.8	7.61	8.2	6.99	54.3	0.03	65.2	105	318
Carey Bay	4698	KBAS	11/17/98	12:50:00	4.8	1	11.7	7.65	8.17	7.02	55.1	0.04	65.5	659	320

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	15	0.5	12.6	7.37	7	41.8	0.03	105.6	44	428
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	14	1.5	12.6	6.79	6.98	39.5	0.03	103.7	56	431
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	13	2.5	12.6	6.41	6.99	38.7	0.02	102.9	101	431
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	12	3.5	12.6	6.36	6.97	38.9	0.02	102.8	32	432
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	11	4.5	12.6	6.31	6.91	38.8	0.02	102.6	32	435
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	10	5.5	12.6	6.26	6.91	38.9	0.02	102.4	39	435
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	9	6.5	12.6	6.25	6.87	39	0.02	102.3	31	438
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	8	7.5	12.5	6.22	6.9	39.1	0.03	101.4	103	436
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	7	8.5	12.5	6.17	6.83	39	0.02	101.6	43	439
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	6	9.5	12.4	6.07	6.83	39.1	0.03	100.6	46	439
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	5	10.5	12.5	6.05	6.77	39	0.03	100.6	25	442
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	4	11.5	12.4	5.85	6.75	39.3	0.03	99.7	48	443
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	3	12.5	12.3	5.77	6.73	40	0.03	98.6	34	445
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	2	13.5	12.2	5.77	6.7	41.1	0.03	97.7	44	447
Conkling Point	1398	DBRP	4/3/98	10:42:23	3.1	1	14.5	11.8	5.8	6.67	43.4	0.03	95	228	449
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	16	0.3	11.9	11.12	7.08	42.8	0.03	107.7	100	402
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	15	0.8	11.8	10.68	7.13	42.6	0.03	105.9	132	403
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	14	1.7	12	8.65	7.09	42.2	0.03	103	121	404
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	13	2.8	11.9	7.88	7.08	42.4	0.03	100.1	105	407
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	12	3.7	11.9	7.35	6.99	42.7	0.03	98.5	56	410
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	11	4.8	11.8	7.14	6.9	42.8	0.03	97.2	125	414

Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	10	5.8	11.8	7.01	6.95	42.8	0.03	97	145	410
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	9	6.8	11.7	6.71	6.96	43.2	0.03	95.4	142	407
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	8	7.8	11.7	6.64	6.89	43.5	0.03	95.5	140	409
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	7	8.8	11.7	6.51	6.85	44.2	0.03	94.9	118	410
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	6	9.8	11.7	6.38	6.9	44.6	0.03	94.6	142	405
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	5	10.8	11.7	6.17	6.85	45.5	0.03	94	145	406
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	4	11.8	11.7	5.92	6.83	46.8	0.03	93.1	104	404
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	3	12.7	11.3	5.89	6.77	47.4	0.03	90.3	117	405
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	2	13.7	11.1	5.8	6.72	47.9	0.03	88.5	113	406
Conkling Point	1698	DBASRP	4/21/98	14:06:07	2.6	1	14.8	11	5.59	6.72	49.3	0.03	87.3	325	406
Conkling Point	2198	ASJLDT	5/26/98	13:45:03	3.8	11	0.3	11.2	11.87	7.08	33.4	0.02	104.3	23	385
Conkling Point	2198	ASJLDT	5/26/98	13:45:03	3.8	10	1.5	11.2	11.89	7.15	33.5	0.02	104.3	32	379
Conkling Point	2198	ASJLDT	5/26/98	13:45:03	3.8	9	3	11.2	11.45	7.09	33.4	0.02	103.5	44	379
Conkling Point	2198	ASJLDT	5/26/98	13:45:03	3.8	8	4.5	11.2	11.1	7.15	33.3	0.02	103.2	38	374
Conkling Point	2198	ASJLDT	5/26/98	13:45:03	3.8	7	6	11.3	10.99	7.07	33.2	0.02	103	46	377
Conkling Point	2198	ASJLDT	5/26/98	13:45:03	3.8	6	7.5	11.3	10.74	6.99	33.1	0.02	102.6	33	378
Conkling Point	2198	ASJLDT	5/26/98	13:45:03	3.8	5	9	11.2	10.25	6.99	32.6	0.02	100.7	40	376
Conkling Point	2198	ASJLDT	5/26/98	13:45:03	3.8	4	10.5	11.2	9.45	6.9	32.5	0.02	98.6	44	378
Conkling Point	2198	ASJLDT	5/26/98	13:45:03	3.8	3	12	11.2	9.25	6.89	32	0.02	98.4	104	377
Conkling Point	2198	ASJLDT	5/26/98	13:45:03	3.8	2	13.5	11.3	9.24	6.93	32	0.02	99	107	373
Conkling Point	2198	ASJLDT	5/26/98	13:45:03	3.8	1	15.2	11.2	9.15	6.9	32.8	0.02	98.5	153	376
Conkling Point	2398	DTJLAS	6/8/98	13:00:22	2.5	11	0.4	10.7	15.62	7.52	38.9	0.02	108	28	362
Conkling Point	2398	DTJLAS	6/8/98	13:00:22	2.5	10	1.5	10.7	15.51	7.5	38.9	0.02	107.3	101	363
Conkling Point	2398	DTJLAS	6/8/98	13:00:22	2.5	9	3	10.6	14.84	7.43	38.5	0.02	105	125	365
Conkling Point	2398	DTJLAS	6/8/98	13:00:22	2.5	8	4.5	10.8	13.06	7.3	38	0.02	102.6	109	367
Conkling Point	2398	DTJLAS	6/8/98	13:00:22	2.5	7	6	10.6	12.73	7.24	37.9	0.02	100	117	367
Conkling Point	2398	DTJLAS	6/8/98	13:00:22	2.5	6	7.5	10.8	12.22	7.22	37.7	0.02	100.9	55	366
Conkling Point	2398	DTJLAS	6/8/98	13:00:22	2.5	5	9	10.7	12	7.19	37	0.02	99.3	132	366
Conkling Point	2398	DTJLAS	6/8/98	13:00:22	2.5	4	10.5	10.5	11.79	7.13	36.7	0.02	97.4	46	363
Conkling Point	2398	DTJLAS	6/8/98	13:00:22	2.5	3	12	10.7	10.77	7.1	35.9	0.02	96.8	130	363
Conkling Point	2398	DTJLAS	6/8/98	13:00:22	2.5	2	13.5	10.3	9.94	7	37.9	0.02	91.1	158	362
Conkling Point	2398	DTJLAS	6/8/98	13:00:22	2.5	1	15.1	9.16	8.71	6.85	42.2	0.03	78.7	242	361
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	16	0.3	10.1	19.54	7.54	42.2	0.03	109.9	28	355
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	15	1.1	10.1	19.28	7.54	42.1	0.03	109.2	100	356
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	14	2.1	10.3	18.39	7.57	41.9	0.03	109.3	57	356
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	13	3.1	10.5	17.56	7.61	41.7	0.03	109.5	135	356
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	12	4.1	10.6	16.63	7.6	42	0.03	108.7	115	357
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	11	5.1	10.8	16.09	7.61	51	0.03	109.8	214	358
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	10	6.1	10.9	15.25	7.46	49.8	0.03	108.8	159	362
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	9	7.1	10.9	14.79	7.45	43.6	0.03	108.1	53	360
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	8	8.1	11	14.06	7.36	42.9	0.03	106.6	108	362

Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	7	9.1	11	13.81	7.31	41.7	0.03	106.2	206	362
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	6	10.1	11	13.41	7.26	41.5	0.03	105.8	131	362
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	5	11.1	10.8	12.99	7.12	40	0.03	102.7	114	363
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	4	12.1	10.2	12.57	6.98	37.5	0.02	95.6	153	364
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	3	13.1	10.2	12.33	6.95	38.1	0.02	95.7	110	362
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	2	14.1	9.61	11.64	6.87	37.4	0.02	88.5	227	362
Conkling Point	2598	DTASBH	6/22/98	12:17:57	4.3	1	15.1	8.96	11.16	6.81	37.8	0.02	81.5	207	376
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	16	0.3	10.1	24.35	8.72	51.2	0.03	120.3	56	307
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	15	1.3	9.63	20.88	7.56	50.7	0.03	107.3	108	334
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	14	2.3	9.85	19.32	7.46	50.9	0.03	106.4	115	335
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	13	3.3	10.5	18.17	7.7	49.9	0.03	111	130	332
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	12	4.3	10.6	17.57	7.81	50	0.03	110.9	118	328
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	11	5.3	10.7	16.39	7.71	48.5	0.03	108.5	314	331
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	10	6.3	10.6	16.12	7.61	48.2	0.03	107.5	145	332
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	9	7.2	10.5	15.86	7.5	47.5	0.03	105.7	229	332
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	8	8.3	10.3	15.44	7.34	46.8	0.03	102.9	116	333
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	7	9.3	10.2	15.04	7.24	46.4	0.03	100.5	123	333
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	6	10.3	10.1	14.94	7.2	46.3	0.03	99.7	50	333
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	5	11.3	10.1	14.72	7.14	46.5	0.03	98.6	123	332
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	4	12.3	9.79	14.21	7.04	45.8	0.03	95.1	120	332
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	3	13.3	9.63	13.86	6.96	44.9	0.03	92.8	136	330
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	2	14.3	8.31	13.13	6.78	45	0.03	78.8	116	328
Conkling Point	2798	DTASBH	7/7/98	12:07:14	3.2	1	15.3	7.28	11.98	6.71	45.5	0.03	67.2	211	316
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	15	0.9	8.96	23.31	7.81	51.3	0.03	104.7	143	354
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	14	1.9	9.12	22.92	7.92	51.4	0.03	105.8	117	354
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	13	2.9	9.14	22.59	7.86	51.2	0.03	105.3	112	356
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	12	3.9	9.91	21.23	7.94	49.4	0.03	111.3	126	355
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	11	4.9	10.2	20.55	7.99	48.2	0.03	112.5	103	355
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	10	5.9	10.3	19.8	7.95	47.5	0.03	112.8	118	357
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	9	6.9	10.5	18.58	7.77	46.7	0.03	111.4	128	360
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	8	7.9	10.4	16.93	7.48	45.5	0.03	107.4	125	366
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	7	8.9	10.1	16.14	7.27	44.8	0.03	102.6	132	369
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	6	9.9	9.34	14.94	7	44.3	0.03	92.2	132	372
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	5	10.9	8.95	13.78	6.86	43.2	0.03	86.1	116	373
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	4	11.9	7.93	12.54	6.72	43	0.03	74.2	55	373
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	3	12.9	7.84	11.88	6.7	42.5	0.03	72.3	112	372
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	2	13.9	6.95	10.97	6.63	43.8	0.03	62.7	132	372
Conkling Point	2998	ASBH	7/20/98	11:44:42	6.3	1	14.9	6.66	10.25	6.64	44.5	0.03	59.1	304	369
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	16	0.3	8.29	24.51	7.53	59	0.04	99	30	343
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	15	1	8.28	24.09	7.56	59.1	0.04	98.1	35	343
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	14	2.1	8.27	23.8	7.55	59.1	0.04	97.4	29	345

Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	13	3.2	8.26	23.29	7.55	58.6	0.04	96.4	35	346
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	12	4.3	8.44	22.84	7.49	57.1	0.04	97.7	48	347
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	11	5.4	9.08	22.2	7.52	55.7	0.04	103.8	35	347
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	10	6.5	9.19	21.74	7.49	54.3	0.03	104.2	109	348
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	9	7.4	9.46	20.91	7.44	52.3	0.03	105.5	122	349
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	8	8.5	9.58	20.34	7.35	51.3	0.03	105.6	44	352
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	7	9.5	9.61	19.13	7.27	49.7	0.03	103.5	131	353
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	6	10.5	8.5	18.27	7.04	50.3	0.03	89.9	101	356
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	5	11.5	9.45	17.4	7.1	49.1	0.03	98.2	100	356
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	4	12.4	8.77	15.66	6.93	48.1	0.03	87.8	128	358
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	3	13.2	8.29	14.08	6.81	47.2	0.03	80.3	118	359
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	2	14.4	5.74	12.61	6.63	49.2	0.03	53.8	120	359
Conkling Point	3298	DBAS	8/10/98	12:10:22	9.2	1	15.5	4.81	10.31	6.61	52	0.03	42.8	253	359
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	16	0.5	9.01	21.81	7.87	54.1	0.03	102.8	30	362
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	15	1.5	9.01	21.72	7.84	54	0.03	102.6	107	365
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	14	2.5	8.99	21.76	7.86	54.1	0.03	102.4	125	364
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	13	3.5	8.99	21.63	7.82	53.8	0.03	102.1	110	367
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	12	4.5	8.98	21.53	7.81	53.8	0.03	101.9	234	368
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	11	5.5	8.83	21.46	7.71	53.6	0.03	100	137	372
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	10	6.5	8.76	21.44	7.59	54.5	0.03	99.2	147	376
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	9	7.5	8.5	21.29	7.45	54.8	0.04	95.9	138	381
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	8	8.5	7.61	20.76	7.09	53.4	0.03	85.1	208	391
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	7	9.5	8.61	19.68	7.03	47.9	0.03	94.1	112	393
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	6	10.5	8.18	18.42	6.88	45.7	0.03	87.3	221	397
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	5	11.5	8.34	16.63	6.84	44.1	0.03	85.7	316	398
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	4	12.5	6.9	14.91	6.63	44.2	0.03	68.3	203	401
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	3	13.5	6.86	13.55	6.54	43.8	0.03	66	154	401
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	2	14.5	4.84	12.85	6.44	45.8	0.03	45.8	235	401
Conkling Point	3498	ASGL	8/26/98	13:49:11	5.3	1	15.4	3.48	11.23	6.36	49.2	0.03	31.8	434	404
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	16	0.4	9.04	22.58	7.83	59.2	0.04	104.8	33	290
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	15	1.6	9.11	21.56	7.86	59.7	0.04	103.5	52	289
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	14	2.6	9.07	21.42	7.78	58.9	0.04	102.8	41	292
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	13	3.6	9.15	21.28	7.8	58.7	0.04	103.5	42	292
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	12	4.6	9.18	21.14	7.75	58.8	0.04	103.5	40	294
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	11	5.6	9.09	20.97	7.65	58.6	0.04	102.2	37	298
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	10	6.6	9.08	20.97	7.55	58.5	0.04	102	54	303
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	9	7.6	8.87	20.48	7.26	56.9	0.04	98.7	101	312
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	8	8.6	8.6	19.66	6.96	55.2	0.04	94.2	44	321
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	7	9.6	7.21	17.76	6.74	49.4	0.03	76	36	326
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	6	10.6	7.06	16.14	6.7	47.4	0.03	72	100	326
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	5	11.6	6.4	14.56	6.62	47.8	0.03	63	100	328
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	4	12.6	5.45	13.25	6.54	49.1	0.03	52.1	113	327

Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	3	13.6	4.68	12.77	6.51	49.4	0.03	44.3	35	323
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	2	14.6	5.79	11.47	6.52	48.2	0.03	53.2	123	320
Conkling Point	3598	DTAS	9/3/98	13:43:10	5.7	1	15.6	2.78	10.69	6.49	53.3	0.03	25.1	210	313
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	16	0.3	9.07	15.24	7.42	58.7	0.04	90.2	50	325
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	15	0.7	9.07	15.23	7.4	58.6	0.04	90.2	43	326
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	14	1.7	9.05	15.24	7.38	58.5	0.04	90	48	326
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	13	2.7	9.02	15.22	7.38	58.6	0.04	89.7	58	326
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	12	3.7	8.96	15.18	7.35	58.8	0.04	89	58	326
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	11	4.7	8.91	15.19	7.35	58.5	0.04	88.6	54	326
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	10	5.8	8.93	15.17	7.34	58.5	0.04	88.7	56	326
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	9	6.6	8.96	15.16	7.34	59	0.04	89	134	326
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	8	7.7	8.98	15.16	7.35	58.3	0.04	89.2	114	324
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	7	8.7	9	15.14	7.35	58.4	0.04	89.3	142	323
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	6	9.7	9.08	15.14	7.36	59.2	0.04	90.1	123	321
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	5	10.7	9.15	15.04	7.36	58.6	0.04	90.7	135	321
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	4	11.7	9.1	14.91	7.33	58.6	0.04	89.8	109	320
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	3	12.7	9.12	14.88	7.31	58.3	0.04	90	125	319
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	2	13.7	9.2	14.84	7.29	58.6	0.04	90.7	156	318
Conkling Point	4098	KBDB	10/9/98	11:50:00	4.5	1	14.7	8.64	14.59	7.13	59.7	0.04	84.7	344	318
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	15	0.5	9.13	12.92	7.39	58.6	0.04	85.5	115	343
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	14	1.5	9.14	12.81	7.41	58.6	0.04	85.4	47	342
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	13	2.5	9.15	12.71	7.38	58.7	0.04	85.3	53	343
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	12	3.5	9.13	12.63	7.34	58.7	0.04	84.9	114	346
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	11	4.5	9.07	12.58	7.33	58.8	0.04	84.3	125	346
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	10	5.5	9.01	12.56	7.32	58.3	0.04	83.7	41	345
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	9	6.5	9.01	12.55	7.31	58.4	0.04	83.7	52	345
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	8	7.5	8.98	12.51	7.32	58.7	0.04	83.3	126	343
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	7	8.5	9.05	12.46	7.33	58.3	0.04	83.8	39	343
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	6	9.5	9.06	12.4	7.33	58.7	0.04	83.8	156	343
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	5	10.5	9.11	12.27	7.34	58.8	0.04	84.1	110	341
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	4	11.5	9.17	12.17	7.36	58.7	0.04	84.4	58	339
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	3	12.5	9.49	11.91	7.39	58.4	0.04	86.8	57	338
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	2	13.5	9.51	11.46	7.32	59	0.04	86.2	43	339
Conkling Point	4298	DTASJB	10/19/98	11:49:36	4.8	1	14.5	9.26	11.35	7.28	59	0.04	83.6	645	340
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	15	0.3	8.23	8.32	7.16	54.7	0.04	70.7	44	327
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	14	1	8.21	8.33	7.15	54.9	0.04	70.6	46	328
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	13	2	8.21	8.33	7.17	54.7	0.04	70.6	48	326
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	12	3	8.21	8.32	7.11	54.5	0.03	70.5	57	329
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	11	4	8.19	8.32	7.12	54.6	0.03	70.4	101	4
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	10	5	8.15	8.3	7.09	54.7	0.04	70	41	329
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	9	6	8.11	8.29	7.09	54.4	0.03	71.9	8	328

Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	8	7	8.07	8.22	7.06	54.2	0.03	69.2	51	328
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	7	8	7.86	8.11	7.01	54.1	0.03	67.2	120	327
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	6	9	7.48	8.04	6.96	54.4	0.03	63.8	116	326
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	5	10	7.61	7.99	7	54	0.03	64.9	112	324
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	4	10.9	7.97	7.88	7.05	54.5	0.03	67.8	123	321
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	3	12	8.29	7.76	0	54.1	0.03	70.3	149	319
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	2	13	8.9	6.73	7.15	54.8	0.04	73.6	44	316
Conkling Point	4698	KBAS	11/17/98	12:18:00	4.1	1	14	8.9	6.73	7.16	54.5	0.03	73.6	555	315

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Hidden Lake	1398	DBRP	4/3/98	10:57:54	2	10	0.3	12.2	7.79	7.06	37.8	0.02	103.2	43	389
Hidden Lake	1398	DBRP	4/3/98	10:57:54	2	9	0.3	12.2	7.79	7.04	37.8	0.02	103.2	105	390
Hidden Lake	1398	DBRP	4/3/98	10:57:54	2	8	1	12.4	6.69	7.08	37.7	0.02	101.6	124	388
Hidden Lake	1398	DBRP	4/3/98	10:57:54	2	7	2	12.5	6.26	7.08	37.9	0.02	101.2	46	387
Hidden Lake	1398	DBRP	4/3/98	10:57:54	2	6	3	12.4	6.18	7.04	37.6	0.02	100.9	114	389
Hidden Lake	1398	DBRP	4/3/98	10:57:54	2	5	4	12.4	6.15	7	37.9	0.02	100.7	143	390
Hidden Lake	1398	DBRP	4/3/98	10:57:54	2	4	5	12.5	6.1	6.94	37.7	0.02	100.7	144	391
Hidden Lake	1398	DBRP	4/3/98	10:57:54	2	3	6	12.5	6.03	6.96	38	0.02	100.5	134	389
Hidden Lake	1398	DBRP	4/3/98	10:57:54	2	2	7	12.5	5.98	6.91	37.9	0.02	100.4	137	389
Hidden Lake	1398	DBRP	4/3/98	10:57:54	2	1	7.9	12.2	6.22	6.92	37.6	0.02	99	400	387
Hidden Lake	1698	DBASRP	4/21/98	13:37:37	2.2	9	0.3	12	10.09	7.15	41.9	0.03	106.2	121	398
Hidden Lake	1698	DBASRP	4/21/98	13:37:37	2.2	8	1.3	11.9	9.69	7.25	41.7	0.03	104.5	207	394
Hidden Lake	1698	DBASRP	4/21/98	13:37:37	2.2	7	2.3	12.1	8.89	7.18	41.5	0.03	103.9	46	394
Hidden Lake	1698	DBASRP	4/21/98	13:37:37	2.2	6	3.3	12	8.68	7.15	41.5	0.03	102.7	111	394
Hidden Lake	1698	DBASRP	4/21/98	13:37:37	2.2	5	4.3	11.9	8.4	7.11	41.4	0.03	101.3	132	393
Hidden Lake	1698	DBASRP	4/21/98	13:37:37	2.2	4	5.4	11.9	8	7.07	40.9	0.03	100	121	391
Hidden Lake	1698	DBASRP	4/21/98	13:37:37	2.2	3	6.4	11.7	7.76	6.99	41	0.03	97.5	141	389
Hidden Lake	1698	DBASRP	4/21/98	13:37:37	2.2	2	7.4	10.3	7.36	6.79	41.3	0.03	85.1	55	388
Hidden Lake	1698	DBASRP	4/21/98	13:37:37	2.2	1	7.3	10.6	7.48	6.84	41.1	0.03	87.8	216	391
Hidden Lake	2198	ASJLDT	5/26/98	14:05:25	2.1	9	0.3	11.1	9.51	6.95	32.5	0.02	98.4	40	339
Hidden Lake	2198	ASJLDT	5/26/98	14:05:25	2.1	8	1.3	11.1	9.42	6.92	32.8	0.02	98.2	36	337
Hidden Lake	2198	ASJLDT	5/26/98	14:05:25	2.1	7	2.3	11.1	9.33	6.96	32.9	0.02	98.1	43	331
Hidden Lake	2198	ASJLDT	5/26/98	14:05:25	2.1	6	3.3	11.2	9.3	6.94	33.1	0.02	98.1	35	328
Hidden Lake	2198	ASJLDT	5/26/98	14:05:25	2.1	5	4.3	11.1	9.28	6.86	33.1	0.02	97.8	39	328
Hidden Lake	2198	ASJLDT	5/26/98	14:05:25	2.1	4	5.3	11.1	9.25	6.96	33	0.02	97.4	39	316
Hidden Lake	2198	ASJLDT	5/26/98	14:05:25	2.1	3	6.3	11.1	9.27	6.81	32.9	0.02	97.5	37	318
Hidden Lake	2198	ASJLDT	5/26/98	14:05:25	2.1	2	7.3	11.1	9.25	6.95	32.8	0.02	97.3	37	309
Hidden Lake	2198	ASJLDT	5/26/98	14:05:25	2.1	1	8.3	11.1	9.22	6.95	32.8	0.02	97.1	107	318
Hidden Lake	2398	DTJLAS	6/8/98	13:26:09	2.4	11	0.4	11	15.62	7.51	38.7	0.02	110.5	29	352
Hidden Lake	2398	DTJLAS	6/8/98	13:26:09	2.4	10	1.2	11.1	14.27	7.47	38.6	0.02	108.4	44	355

Hidden Lake	2398	DTJLAS	6/8/98	13:26:09	2.4	9	2	11.1	13.89	7.45	38.2	0.02	107.4	103	355
Hidden Lake	2398	DTJLAS	6/8/98	13:26:09	2.4	8	2.7	11	13.51	7.34	38.2	0.02	105.1	108	357
Hidden Lake	2398	DTJLAS	6/8/98	13:26:09	2.4	7	3.5	11	12.57	7.22	36.7	0.02	103.6	103	358
Hidden Lake	2398	DTJLAS	6/8/98	13:26:09	2.4	6	4.2	10.6	12.11	7.11	36.3	0.02	98.2	59	359
Hidden Lake	2398	DTJLAS	6/8/98	13:26:09	2.4	5	5	10.4	11.85	7.02	36.3	0.02	95.9	39	359
Hidden Lake	2398	DTJLAS	6/8/98	13:26:09	2.4	4	5.7	9.68	11.46	6.94	36.4	0.02	88.8	129	359
Hidden Lake	2398	DTJLAS	6/8/98	13:26:09	2.4	3	6.5	9.13	10.85	6.87	36.5	0.02	82.5	130	357
Hidden Lake	2398	DTJLAS	6/8/98	13:26:09	2.4	2	7.2	8.76	10.62	6.83	36.3	0.02	78.7	122	353
Hidden Lake	2398	DTJLAS	6/8/98	13:26:09	2.4	1	8	7.97	10.21	6.77	37	0.02	71	233	347
Hidden Lake	2598	DTASBH	6/22/98	12:17:57	3.2	10	0.3	10.1	19.32	7.68	40.6	0.03	110	36	336
Hidden Lake	2598	DTASBH	6/22/98	12:17:57	3.2	9	1.2	10.2	18.75	7.64	40.7	0.03	109.2	112	338
Hidden Lake	2598	DTASBH	6/22/98	12:17:57	3.2	8	2	10.2	18.29	7.6	40.8	0.03	108.4	105	339
Hidden Lake	2598	DTASBH	6/22/98	12:17:57	3.2	7	2.7	10.2	17.41	7.53	40	0.03	106.8	117	340
Hidden Lake	2598	DTASBH	6/22/98	12:17:57	3.2	6	3.5	10.2	16.31	7.34	39.5	0.03	104.3	156	344
Hidden Lake	2598	DTASBH	6/22/98	12:17:57	3.2	5	4.2	10.6		7.15	37.2	0.02	105.9	135	348
Hidden Lake	2598	DTASBH	6/22/98	12:17:57	3.2	4	5	8.81	12.82	6.81	35.9	0.02	83.3	143	354
Hidden Lake	2598	DTASBH	6/22/98	12:17:57	3.2	3	5.7	7.14	12.03	6.6	36.3	0.02	66.3	146	356
Hidden Lake	2598	DTASBH	6/22/98	12:17:57	3.2	2	6.5	4.53	11.28	6.47	37.7	0.02	41.3	236	354
Hidden Lake	2598	DTASBH	6/22/98	12:17:57	3.2	1	7.2	4.15	11.18	6.45	38	0.02	37.8	506	344
Hidden Lake	2798	DTASBH	7/7/98	11:36:34	4.6	11	0.4	9.9	24.13	8.46	49.2	0.03	117.3	151	320
Hidden Lake	2798	DTASBH	7/7/98	11:36:34	4.6	10	1	9.91	23.67	8.48	49.2	0.03	116.4	139	322
Hidden Lake	2798	DTASBH	7/7/98	11:36:34	4.6	9	1.7	10.2	22.84	8.52	48.8	0.03	117.6	117	323
Hidden Lake	2798	DTASBH	7/7/98	11:36:34	4.6	8	2.5	10.9	21.28	8.48	47.9	0.03	122.8	110	326
Hidden Lake	2798	DTASBH	7/7/98	11:36:34	4.6	7	3.2	11.1	19.38	8.19	45.9	0.03	119.5	141	334
Hidden Lake	2798	DTASBH	7/7/98	11:36:34	4.6	6	4	10.7	17.54	7.58	44.7	0.03	111.6	111	349
Hidden Lake	2798	DTASBH	7/7/98	11:36:34	4.6	5	4.7	10.8	15.86	7.19	40.8	0.03	108.3	39	353
Hidden Lake	2798	DTASBH	7/7/98	11:36:34	4.6	4	5.5	8.58	14.59	6.79	39.9	0.03	84	112	359
Hidden Lake	2798	DTASBH	7/7/98	11:36:34	4.6	3	6.2	6.08	13.13	6.52	41.1	0.03	57.6	109	361
Hidden Lake	2798	DTASBH	7/7/98	11:36:34	4.6	2	7	4.01	12.46	6.46	42.2	0.03	37.5	121	359
Hidden Lake	2798	DTASBH	7/7/98	11:36:34	4.6	1	7.6	2.9	12.33	6.45	45.9	0.03	27	320	358
Hidden Lake	2998	ASBH	7/21/98	9:51:57	6.8	9	0.4	9.31	24.51	8.39	49.4	0.03	111.2	123	258
Hidden Lake	2998	ASBH	7/21/98	9:51:57	6.8	8	1.4	9.16	24.27	8.31	49.3	0.03	109	122	255
Hidden Lake	2998	ASBH	7/21/98	9:51:57	6.8	7	2.4	9.23	23.89	8.28	49.4	0.03	109	138	250
Hidden Lake	2998	ASBH	7/21/98	9:51:57	6.8	6	3.4	9.19	23.84	8.18	49.2	0.03	108.4	158	245
Hidden Lake	2998	ASBH	7/21/98	9:51:57	6.8	5	4.4	10.9	19.8	7.47	42.1	0.03	118.8	111	259
Hidden Lake	2998	ASBH	7/21/98	9:51:57	6.8	4	5.4	11.4	17.3	7.21	40.4	0.03	117.9	133	259
Hidden Lake	2998	ASBH	7/21/98	9:51:57	6.8	3	6.4	7.73	14.94	6.66	42.1	0.03	76.3	136	256
Hidden Lake	2998	ASBH	7/21/98	9:51:57	6.8	2	7.4	3.6	13.65	6.46	44.2	0.03	34.6	133	222
Hidden Lake	2998	ASBH	7/21/98	9:51:57	6.8	1	8.4	0.25	13.27	6.47	57.6	0.04	2.3	202	168
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	13	0.3	9.19	25.06	8.36	53.4	0.03	110.8	50	253
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	12	0.8	9.27	24.79	8.4	53.3	0.03	111.2	131	250

Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	11	1.4	9.34	24.66	8.42	53.2	0.03	111.8	50	248
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	10	2	9.4	24.49	8.46	53.3	0.03	112.2	44	244
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	9	2.6	9.49	24.42	8.45	53.4	0.03	113.1	132	243
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	8	3.2	9.37	24.13	8.39	53.1	0.03	111	133	237
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	7	3.9	9.61	24.02	8.5	53.8	0.03	113.7	111	228
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	6	4.6	10.5	23.35	8.45	51.9	0.03	122.9	157	222
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	5	5.3	13.3	21.42	8.52	44.9	0.03	149.5	132	202
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	4	6	13.2	19.3	8.42	48.7	0.03	142.7	104	160
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	3	6.6	0.21	16.81	6.51	56	0.04	2.1	111	163
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	2	7.1	0.19	15.35	6.55	56.7	0.04	1.9	130	134
Hidden Lake	3298	DBAS	8/11/98	13:00:48	5.6	1	7.7	0.23	14.04	6.65	76.9	0.05	2.2	323	99
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	12	0.3	9.41	22.01	8.34	53.3	0.03	107.7	141	231
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	11	1	9.43	21.97	8.32	53.3	0.03	107.8	129	230
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	10	1.7	9.43	21.85	8.28	53.3	0.03	107.6	117	229
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	9	2.5	9.42	21.62	8.29	53.3	0.03	107	112	223
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	8	3.2	9.42	21.58	8.28	53	0.03	106.9	203	221
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	7	4	9.41	21.55	8.27	53.1	0.03	106.8	129	214
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	6	4.7	9.37	21.55	8.25	53.1	0.03	106.3	149	202
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	5	5.5	9.69	21.32	8.37	53.9	0.03	109.4	132	176
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	4	6.2	2.34	20.16	6.86	58.8	0.04	25.9	203	185
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	3	7	0.13	17.95	6.7	67.5	0.04	1.4	201	123
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	2	7.7	0.12	15.42	6.89	83.7	0.05	1.2	132	55
Hidden Lake	3498	ASGL	8/26/98	11:45:08	3.8	1	8.5	0.15	13.55	7.04	129.1	0.08	1.4	318	32
Hidden Lake	3598	DTAS	9/3/98	13:09:26	6.2	9	0.3	9.46	22.13	8.26	57.9	0.04	108.7	40	238
Hidden Lake	3598	DTAS	9/3/98	13:09:26	6.2	8	1	9.48	21.97	8.27	57.9	0.04	108.6	41	232
Hidden Lake	3598	DTAS	9/3/98	13:09:26	6.2	7	2	9.48	21.74	8.21	57.7	0.04	108.2	42	231
Hidden Lake	3598	DTAS	9/3/98	13:09:26	6.2	6	3	9.47	21.6	8.17	57.7	0.04	107.7	151	224
Hidden Lake	3598	DTAS	9/3/98	13:09:26	6.2	5	4	9.42	21.53	8.02	58.1	0.04	107	38	209
Hidden Lake	3598	DTAS	9/3/98	13:09:26	6.2	4	5	9.34	21.46	7.9	57.8	0.04	106	129	206
Hidden Lake	3598	DTAS	9/3/98	13:09:26	6.2	3	6	4.92	20.83	7	59.6	0.04	55.2	125	217
Hidden Lake	3598	DTAS	9/3/98	13:09:26	6.2	2	7	0.12	17.86	6.64	77.7	0.05	1.3	58	184
Hidden Lake	3598	DTAS	9/3/98	13:09:26	6.2	1	7.8	0.17	15.2	6.93	116.9	0.07	1.7	309	90
Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	12	0.3	9.83	14.5	7.84	57.7	0.04	96.2	53	313
Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	11	0.9	9.88	14.45	7.83	57.7	0.04	96.6	59	314
Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	10	1.7	9.84	14.27	7.75	57.6	0.04	95.9	43	316
Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	9	2.4	9.64	14.23	7.69	57.7	0.04	93.8	54	317
Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	8	3.1	9.48	14.21	7.61	57.6	0.04	92.2	103	320
Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	7	3.8	9.48	14.22	7.65	57.8	0.04	92.2	111	317
Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	6	4.5	9.46	14.2	7.63	57.7	0.04	92	122	318
Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	5	5.2	9.47	14.18	7.65	57.9	0.04	92.1	55	317
Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	4	5.9	9.69	14.13	7.68	57.2	0.04	94.1	153	317
Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	3	6.6	9.76	14.08	7.66	57.4	0.04	94.7	113	317

Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	2	7.3	9.76	14.03	7.63	57.7	0.04	94.6	143	317
Hidden Lake	4098	KBDB	10/9/98	12:22:00	2.7	1	7.9	9.94	13.86	7.58	57.6	0.04	95.9	401	323
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	13	0.4	10.4	11.18	7.89	57.8	0.04	93.4	39	335
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	12	1	10.4	11.13	7.9	57.9	0.04	93.2	52	335
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	11	1.5	10.4	11	7.9	57.5	0.04	92.9	42	336
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	10	2	10.4	10.95	7.86	57.8	0.04	92.9	116	338
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	9	2.5	10.4	10.79	7.86	57.5	0.04	92.5	38	337
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	8	3	10.4	10.77	7.82	57.6	0.04	92.3	56	339
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	7	3.5	10.3	10.76	7.8	57.5	0.04	92	119	339
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	6	4	10.3	10.71	7.75	57.6	0.04	91.7	47	340
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	5	4.5	10.3	10.68	7.76	57.3	0.04	91.4	38	339
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	4	5	10.3	10.66	7.76	57.5	0.04	91.6	37	339
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	3	5.5	10.4	10.64	7.77	57.4	0.04	92.3	46	339
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	2	6	10.4	10.58	7.76	57.6	0.04	92.5	119	339
Hidden Lake	4298	DTASJB	10/19/98	11:09:03	2.7	1	6.5	10.4	10.58	7.69	57.6	0.04	92.5	228	346
Hidden Lake	4698	KBAS	11/17/98	11:23:00	3.3	8	0.3	9.83	6.86	7.7	53.4	0.03	81.4	100	277
Hidden Lake	4698	KBAS	11/17/98	11:23:00	3.3	7	1.2	9.81	6.85	7.73	53.7	0.03	81.3	125	273
Hidden Lake	4698	KBAS	11/17/98	11:23:00	3.3	6	2.2	9.75	6.82	7.68	53.4	0.03	80.8	130	272
Hidden Lake	4698	KBAS	11/17/98	11:23:00	3.3	5	3.3	9.72	6.79	7.64	53.4	0.03	80.4	121	270
Hidden Lake	4698	KBAS	11/17/98	11:23:00	3.3	4	4.2	9.72	6.79	7.61	53.6	0.03	80.4	55	267
Hidden Lake	4698	KBAS	11/17/98	11:23:00	3.3	3	5.2	9.7	6.78	7.61	53.4	0.03	80.2	134	264
Hidden Lake	4698	KBAS	11/17/98	11:23:00	3.3	2	6.2	9.63	6.79	7.56	53.5	0.03	79.7	115	261
Hidden Lake	4698	KBAS	11/17/98	11:23:00	3.3	1	7.2	9.6	6.79	7.54	53.3	0.03	79.4	713	256

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Round Lake	1398	DBRP	4/3/98	13:04:20	1.3	4	0.2	12.5	6.13	7.04	41.8	0.03	101.5	46	396
Round Lake	1398	DBRP	4/3/98	13:04:20	1.3	3	0.5	12.6	6.05	7.02	41.7	0.03	101.4	57	399
Round Lake	1398	DBRP	4/3/98	13:04:20	1.3	2	0.9	12.5	6.1	7.02	41.6	0.03	101.4	154	401
Round Lake	1398	DBRP	4/3/98	13:04:20	1.3	1	1.3	12.7	6.36	6.98	41.8	0.03	103.5	153	405
Round Lake	1698	DBASRP	4/21/98	12:28:46	1.0	4	0.4	11.8	9.13	7.05	44.1	0.03	102.4	57	376
Round Lake	1698	DBASRP	4/21/98	12:28:46	1.0	3	0.6	11.8	8.97	7.1	44	0.03	101.9	54	374
Round Lake	1698	DBASRP	4/21/98	12:28:46	1.0	2	0.8	11.8	8.99	7.07	44	0.03	101.6	213	376
Round Lake	1698	DBASRP	4/21/98	12:28:46	1.0	1	1	11.7	9.2	7.08	43.7	0.03	101.1	250	395
Round Lake	2098	ASJLDT	5/21/98	14:04:17	1.7	6	0.3	11.9	9.68	7.04	35.3	0.02	104.4	54	410
Round Lake	2098	ASJLDT	5/21/98	14:04:17	1.7	5	0.3	11.9	9.76	7.07	35.2	0.02	105.1	50	410
Round Lake	2098	ASJLDT	5/21/98	14:04:17	1.7	4	1	11.9	9.66	7.06	35.3	0.02	104.9	58	410
Round Lake	2098	ASJLDT	5/21/98	14:04:17	1.7	3	1	11.9	9.64	7.02	35.2	0.02	105	102	414
Round Lake	2098	ASJLDT	5/21/98	14:04:17	1.7	2	1.7	11.9	9.66	7.03	35.3	0.02	105.1	57	414
Round Lake	2098	ASJLDT	5/21/98	14:04:17	1.7	1	1.7	11.9	9.68	7.05	35.3	0.02	105	340	413

Round Lake	2398	DTJLAS	6/8/98	14:10:07	1.8	8	0.3	10.7	12.62	7.3	39.2	0.03	100.9	35	368
Round Lake	2398	DTJLAS	6/8/98	14:10:07	1.8	7	0.3	10.7	12.62	7.3	39.2	0.03	100.3	44	369
Round Lake	2398	DTJLAS	6/8/98	14:10:07	1.8	6	0.7	10.7	12.58	7.27	39.2	0.03	100.8	47	371
Round Lake	2398	DTJLAS	6/8/98	14:10:07	1.8	5	0.7	10.7	12.64	7.29	39.3	0.03	100.4	122	370
Round Lake	2398	DTJLAS	6/8/98	14:10:07	1.8	4	1.2	10.8	12.46	7.28	39.2	0.03	100.9	43	371
Round Lake	2398	DTJLAS	6/8/98	14:10:07	1.8	3	1.2	10.8	12.48	7.28	39.2	0.03	101	116	372
Round Lake	2398	DTJLAS	6/8/98	14:10:07	1.8	2	1.8	10.9	12.49	7.28	39.3	0.03	101.9	44	372
Round Lake	2398	DTJLAS	6/8/98	14:10:07	1.8	1	1.8	10.9	12.54	7.27	39.2	0.03	102.1	215	372
Round Lake	2598	DTASBH	6/22/98	10:57:51	1.6	6	0.3	10.3	16.71	7.36	43.9	0.03	106.2	123	343
Round Lake	2598	DTASBH	6/22/98	10:57:51	1.6	5	0.3	10.3	16.36	7.33	44	0.03	105.1	49	343
Round Lake	2598	DTASBH	6/22/98	10:57:51	1.6	4	0.9	9.99	15.66	7.28	43.6	0.03	100.6	213	345
Round Lake	2598	DTASBH	6/22/98	10:57:51	1.6	3	0.9	10.1	15.83	7.28	43.6	0.03	101.8	143	343
Round Lake	2598	DTASBH	6/22/98	10:57:51	1.6	2	1.6	10	15.39	7.25	43.6	0.03	100.5	112	343
Round Lake	2598	DTASBH	6/22/98	10:57:51	1.6	1	1.6	10.1	15.4	7.25	43.8	0.03	100.6	323	343
Round Lake	2798	DTASBH	7/7/98	9:38:04	2.0	4	0.4	9.08	20.76	7.32	53.3	0.03	100.9	135	340
Round Lake	2798	DTASBH	7/7/98	9:38:04	2.0	3	1	9.13	20.08	7.27	53.1	0.03	100.2	236	343
Round Lake	2798	DTASBH	7/7/98	9:38:04	2.0	2	1.5	9.18	19.9	7.26	53	0.03	100.4	203	342
Round Lake	2798	DTASBH	7/7/98	9:38:04	2.0	1	2	9.23	19.9	7.3	52.8	0.03	100.9	403	350
Round Lake	2998	ASBH	7/21/98	10:20:54	1.5	4	0.4	8.75	23.47	7.41	54.5	0.03	102.6	56	306
Round Lake	2998	ASBH	7/21/98	10:20:54	1.5	3	0.4	8.86	23.29	7.38	54.6	0.03	103.5	126	307
Round Lake	2998	ASBH	7/21/98	10:20:54	1.5	2	1.6	9.43	22.04	7.47	54.1	0.03	107.6	104	303
Round Lake	2998	ASBH	7/21/98	10:20:54	1.5	1	1.5	9.38	22.02	7.42	53.9	0.03	107	311	304
Round Lake	3298	DBAS	8/11/98	10:29:32	1.2	3	0.4	8.24	23.86	7.4	60.7	0.04	97.2	53	306
Round Lake	3298	DBAS	8/11/98	10:29:32	1.2	2	0.8	8.43	23.64	7.4	60.6	0.04	99	132	306
Round Lake	3298	DBAS	8/11/98	10:29:32	1.2	1	1.2	8.46	23.49	7.42	60.7	0.04	99.1	25	306
Round Lake	3498	ASGL	8/26/98	12:18:56	.8	4	0.3	9.37	22.9	7.69	60.2	0.04	109.1	33	258
Round Lake	3498	ASGL	8/26/98	12:18:56	.8	3	0.3	9.41	22.9	7.7	60.2	0.04	109.6	53	256
Round Lake	3498	ASGL	8/26/98	12:18:56	.8	2	0.8	9.53	22.83	7.7	60.2	0.04	110.8	41	256
Round Lake	3498	ASGL	8/26/98	12:18:56	.8	1	0.8	9.55	22.83	7.7	60.2	0.04	111.1	216	255
Round Lake	3598	DTAS	9/3/98	11:19:20	1.1	4	0.2	8.49	21.95	7.38	65.4	0.04	97.3	120	258
Round Lake	3598	DTAS	9/3/98	11:19:20	1.1	3	0.2	8.42	21.78	7.34	65.4	0.04	96.1	109	258
Round Lake	3598	DTAS	9/3/98	11:19:20	1.1	2	1.1	8.35	21.35	7.35	65.3	0.04	94.5	227	254
Round Lake	3598	DTAS	9/3/98	11:19:20	1.1	1	1.1	8.45	21.37	7.38	65.2	0.04	95.7	142	251
Round Lake	4098	KBDB	10/9/98	13:55:00	1.0	3	0.3	11.2	14.38	8.2	61.5	0.04	109.2	104	287
Round Lake	4098	KBDB	10/9/98	13:55:00	1.0	2	0.6	11.6	14.21	8.39	61.3	0.04	112.9	131	284
Round Lake	4098	KBDB	10/9/98	13:55:00	1.0	1	1.1	12.6	13.78	8.63	61	0.04	121.5	101	274

Round Lake	4298	DTASJB	10/19/98	10:22:53	.7	3	0.7	11.9	9.63	8.28	61.1	0.04	103.1	40	334
Round Lake	4298	DTASJB	10/19/98	10:22:53	.7	2	0.7	11.9	9.63	8.29	61	0.04	103.4	43	335
Round Lake	4298	DTASJB	10/19/98	10:22:53	.7	1	0.7	12.1	9.58	8.3	61.1	0.04	104.7	114	336

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Chatcolet Lake DP	1098	DBRP	3/13/98	13:19:09	1.0	11	0.3	13.5	5.65	7.07	45.1	0.03	106.2	37	390
Chatcolet Lake DP	1098	DBRP	3/13/98	13:19:09	1.0	10	1.1	13.4	5.46	7.1	45	0.03	105.4	47	388
Chatcolet Lake DP	1098	DBRP	3/13/98	13:19:09	1.0	9	2.1	13.3	5.04	7.07	44.6	0.03	103.8	119	389
Chatcolet Lake DP	1098	DBRP	3/13/98	13:19:09	1.0	8	3.1	13.3	4.93	6.99	44.5	0.03	102.8	55	391
Chatcolet Lake DP	1098	DBRP	3/13/98	13:19:09	1.0	7	4.1	13.3	4.59	7	44.3	0.03	102.1	113	389
Chatcolet Lake DP	1098	DBRP	3/13/98	13:19:09	1.0	6	5.1	13.3	4.34	7.07	44.8	0.03	101.2	103	385
Chatcolet Lake DP	1098	DBRP	3/13/98	13:19:09	1.0	5	6.1	13.3	4.34	6.97	45	0.03	101.2	55	389
Chatcolet Lake DP	1098	DBRP	3/13/98	13:19:09	1.0	4	7.1	13.3	4.31	7	45.1	0.03	101.3	116	386
Chatcolet Lake DP	1098	DBRP	3/13/98	13:19:09	1.0	3	8.1	13.3	4.31	6.95	45.5	0.03	101.3	139	387
Chatcolet Lake DP	1098	DBRP	3/13/98	13:19:09	1.0	2	9.1	13.3	4.24	6.84	45.3	0.03	101.1	125	391
Chatcolet Lake DP	1098	DBRP	3/13/98	13:19:09	1.0	1	10.1	13	4.34	6.79	44.8	0.03	99.3	237	392
Chatcolet Lake DP	1498	DBAS	4/8/98	14:53:37	2.0	11	0.3	12.3	7.43	7.1	39.2	0.03	102.3	54	398
Chatcolet Lake DP	1498	DBAS	4/8/98	14:53:37	2.0	10	1.1	12.3	7.43	7.04	39.4	0.03	102.2	38	402
Chatcolet Lake DP	1498	DBAS	4/8/98	14:53:37	2.0	9	2.1	12.3	7.4	7.07	39.1	0.03	102.2	56	401
Chatcolet Lake DP	1498	DBAS	4/8/98	14:53:37	2.0	8	3.1	12.3	7.33	7.13	39.1	0.03	101.9	53	398
Chatcolet Lake DP	1498	DBAS	4/8/98	14:53:37	2.0	7	4.1	12.3	7.24	7.06	39.1	0.03	101.6	59	401
Chatcolet Lake DP	1498	DBAS	4/8/98	14:53:37	2.0	6	5.2	12.3	7.19	7.09	38.9	0.02	101.6	40	398
Chatcolet Lake DP	1498	DBAS	4/8/98	14:53:37	2.0	5	6.2	12.3	7.04	7.12	38.6	0.02	101.3	100	396
Chatcolet Lake DP	1498	DBAS	4/8/98	14:53:37	2.0	4	7.2	12.2	7.02	7.01	38.9	0.02	100.9	50	401
Chatcolet Lake DP	1498	DBAS	4/8/98	14:53:37	2.0	3	8.1	12.2	6.89	7.03	38.7	0.02	100.6	37	398
Chatcolet Lake DP	1498	DBAS	4/8/98	14:53:37	2.0	2	9.2	12.2	6.39	6.95	38.3	0.02	99	29	401
Chatcolet Lake DP	1498	DBAS	4/8/98	14:53:37	2.0	1	10.1	12.2	6.36	6.98	38	0.02	99	204	403
Chatcolet Lake DP	1698	DBASRP	4/21/98	13:04:35	2.6	11	0.4	11.9	10.53	7.14	42.5	0.03	106.4	50	392
Chatcolet Lake DP	1698	DBASRP	4/21/98	13:04:35	2.6	10	1.4	11.9	10.33	7.21	42.4	0.03	106	111	391
Chatcolet Lake DP	1698	DBASRP	4/21/98	13:04:35	2.6	9	2.4	12	9.79	7.16	42.3	0.03	105	100	394
Chatcolet Lake DP	1698	DBASRP	4/21/98	13:04:35	2.6	8	3.5	11.9	9.14	7.16	42.1	0.03	103	102	394
Chatcolet Lake DP	1698	DBASRP	4/21/98	13:04:35	2.6	7	4.4	11.8	8.61	7.08	42.8	0.03	101.2	117	397
Chatcolet Lake DP	1698	DBASRP	4/21/98	13:04:35	2.6	6	5.4	11.8	8.46	7.08	43.1	0.03	100	111	395
Chatcolet Lake DP	1698	DBASRP	4/21/98	13:04:35	2.6	5	6.4	11.6	7.95	6.98	43	0.03	97.3	105	400
Chatcolet Lake DP	1698	DBASRP	4/21/98	13:04:35	2.6	4	7.4	11.6	7.43	6.97	42.4	0.03	96	114	399
Chatcolet Lake DP	1698	DBASRP	4/21/98	13:04:35	2.6	3	8.4	11.3	6.9	6.91	41.1	0.03	92.8	134	401
Chatcolet Lake DP	1698	DBASRP	4/21/98	13:04:35	2.6	2	9.4	11.2	6.89	6.92	41.1	0.03	91.6	146	401
Chatcolet Lake DP	1698	DBASRP	4/21/98	13:04:35	2.6	1	10.4	11	7.27	6.95	40.9	0.03	90.9	218	401

Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	12	0.3	11.7	11.76	7.17	34.3	0.02	108.1	152	417
Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	11	1.3	11.7	11.76	7.23	34.4	0.02	108.1	107	415
Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	10	2.3	11.7	11.64	7.13	34.3	0.02	108.1	101	421
Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	9	3.3	11.7	11.56	7.12	34.3	0.02	108.1	115	421
Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	8	4.3	11.7	11.4	7.13	34.4	0.02	107.4	107	418
Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	7	5.3	11.6	10.95	6.9	34.6	0.02	105.7	47	428
Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	6	6.3	11.4	9.73	6.88	34.6	0.02	100.5	156	427
Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	5	7.3	11.3	9.37	6.85	33.8	0.02	99.2	151	427
Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	4	8.4	11.1	8.97	6.82	33.7	0.02	95.9	247	426
Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	3	9.2	11.1	8.97	6.76	33.6	0.02	96.2	206	427
Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	2	10.3	11.1	8.91	6.7	33.7	0.02	96.1	155	428
Chatcolet Lake DP	2098	ASJLDT	5/21/98	12:25:30	2.6	1	11.3	10.9	8.65	6.62	33.6	0.02	93.5	437	429
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	12	0.4	10.7	16.06	7.46	39.6	0.03	108.5	25	355
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	11	1.1	10.7	16.06	7.45	39.6	0.03	108.6	28	356
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	10	2.1	10.5	16.03	7.45	39.7	0.03	106.8	34	355
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	9	3.1	10.7	15.34	7.43	39.4	0.03	107.4	56	355
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	8	4.1	10.9	12.86	7.3	38.4	0.02	103	128	358
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	7	5.1	10.6	12.3	7.17	37.8	0.02	98.6	55	359
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	6	6.1	10.2	11.75	7.09	37.4	0.02	93.8	51	359
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	5	7.1	10.1	11.2	7.04	37	0.02	91.8	48	358
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	4	8.1	9.76	10.56	6.98	36.7	0.02	87.6	48	356
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	3	9.1	9.73	10.21	6.96	36.4	0.02	86.6	37	354
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	2	10.1	9.67	10.1	6.94	36.3	0.02	85.8	40	352
Chatcolet Lake DP	2398	DTJLAS	6/8/98	15:35:20	2.9	1	11.1	9.17	9.38	6.9	36.6	0.02	80.1	225	371
Chatcolet Lake DP	2598	DTASBH	6/22/98	11:40:57	3.1	11	0.4	10.5	19.09	7.66	41.9	0.03	113.2	1021	339
Chatcolet Lake DP	2598	DTASBH	6/22/98	11:40:57	3.1	10	1.4	10.7	18.1	7.62	41.7	0.03	113.6	131	343
Chatcolet Lake DP	2598	DTASBH	6/22/98	11:40:57	3.1	9	2.4	11.1	16.44	7.59	41.6	0.03	113.2	52	346
Chatcolet Lake DP	2598	DTASBH	6/22/98	11:40:57	3.1	8	3.4	10.3	15.52	7.3	40.9	0.03	103.3	227	352
Chatcolet Lake DP	2598	DTASBH	6/22/98	11:40:57	3.1	7	4.4	9.42	14.44	7.07	39.9	0.03	92.4	117	356
Chatcolet Lake DP	2598	DTASBH	6/22/98	11:40:57	3.1	6	5.4	9.42	13.86	7.03	39.9	0.03	91.2	105	356
Chatcolet Lake DP	2598	DTASBH	6/22/98	11:40:57	3.1	5	6.4	8.9	13.18	6.88	38.6	0.02	84.8	55	358
Chatcolet Lake DP	2598	DTASBH	6/22/98	11:40:57	3.1	4	7.4	8.13	12.15	6.78	37.3	0.02	75.7	120	359
Chatcolet Lake DP	2598	DTASBH	6/22/98	11:40:57	3.1	3	8.4	7.63	11.33	6.72	36.8	0.02	69.7	200	358
Chatcolet Lake DP	2598	DTASBH	6/22/98	11:40:57	3.1	2	9.4	7.14	11.11	6.7	37.3	0.02	64.9	141	355
Chatcolet Lake DP	2598	DTASBH	6/22/98	11:40:57	3.1	1	10.4	6.46	10.57	6.7	37.3	0.02	58	228	351
Chatcolet Lake DP	2798	DTASBH	7/7/98	10:48:54	3.6	11	0.4	10.1	23.28	8.48	50.5	0.03	117.5	39	329
Chatcolet Lake DP	2798	DTASBH	7/7/98	10:48:54	3.6	10	1.7	10.4	21.67	8.51	49.8	0.03	117.7	152	333
Chatcolet Lake DP	2798	DTASBH	7/7/98	10:48:54	3.6	9	2.7	10.6	20.77	8.37	49.3	0.03	117.3	134	337
Chatcolet Lake DP	2798	DTASBH	7/7/98	10:48:54	3.6	8	3.7	10.2	19.44	7.61	49.5	0.03	110.3	151	354
Chatcolet Lake DP	2798	DTASBH	7/7/98	10:48:54	3.6	7	4.7	10.2	17.79	7.55	47.2	0.03	106.8	231	356
Chatcolet Lake DP	2798	DTASBH	7/7/98	10:48:54	3.6	6	5.7	9.25	15.62	7.14	45.1	0.03	92.6	204	364

Chatcolet Lake DP	2798	DTASBH	7/7/98	10:48:54	3.6	5	6.7	7.9	14.66	6.9	44.1	0.03	77.4	304	367
Chatcolet Lake DP	2798	DTASBH	7/7/98	10:48:54	3.6	4	7.7	7.16	13.71	6.74	43.3	0.03	68.8	102	369
Chatcolet Lake DP	2798	DTASBH	7/7/98	10:48:54	3.6	3	8.7	5.81	12.85	6.64	42.6	0.03	54.7	247	369
Chatcolet Lake DP	2798	DTASBH	7/7/98	10:48:54	3.6	2	9.7	4.78	12.16	6.58	42.9	0.03	44.4	126	367
Chatcolet Lake DP	2798	DTASBH	7/7/98	10:48:54	3.6	1	10.7	4.21	12.16	6.59	43.4	0.03	39	309	364
Chatcolet Lake DP	2998	ASBH	7/21/98	12:25:45	6.8	11	0.6	9.15	25.45	8.49	51.1	0.03	111.3	144	283
Chatcolet Lake DP	2998	ASBH	7/21/98	12:25:45	6.8	10	1.6	9.13	24	8.28	50.2	0.03	108.1	101	287
Chatcolet Lake DP	2998	ASBH	7/21/98	12:25:45	6.8	9	2.6	9.15	23.53	8.26	50.1	0.03	107.4	120	289
Chatcolet Lake DP	2998	ASBH	7/21/98	12:25:45	6.8	8	3.6	9.15	23.22	8.13	49.8	0.03	106.7	128	293
Chatcolet Lake DP	2998	ASBH	7/21/98	12:25:45	6.8	7	4.6	9.16	22.63	7.86	49	0.03	105.7	121	302
Chatcolet Lake DP	2998	ASBH	7/21/98	12:25:45	6.8	6	5.6	9.15	19.82	7.21	45.9	0.03	100	102	315
Chatcolet Lake DP	2998	ASBH	7/21/98	12:25:45	6.8	5	6.6	7.22	16.49	6.78	43.3	0.03	73.7	120	322
Chatcolet Lake DP	2998	ASBH	7/21/98	12:25:45	6.8	4	7.6	5.34	13.88	6.57	42.4	0.03	51.5	120	324
Chatcolet Lake DP	2998	ASBH	7/21/98	12:25:45	6.8	3	8.6	3.24	13.02	6.48	43.9	0.03	30.7	122	323
Chatcolet Lake DP	2998	ASBH	7/21/98	12:25:45	6.8	2	9.6	1.63	12.25	6.45	46	0.03	15.1	130	320
Chatcolet Lake DP	2998	ASBH	7/21/98	12:25:45	6.8	1	10.6	0.97	12.44	6.49	47.9	0.03	9	528	317
Chatcolet Lake DP	3298	DBAS	8/11/98	9:27:45	4.8	11	0.3	9.4	23.84	8.81	54.5	0.03	110.8	35	245
Chatcolet Lake DP	3298	DBAS	8/11/98	9:27:45	4.8	10	1.3	9.49	23.76	8.84	54.6	0.03	111.8	213	243
Chatcolet Lake DP	3298	DBAS	8/11/98	9:27:45	4.8	9	2.3	9.62	23.6	8.9	55	0.04	112.9	53	234
Chatcolet Lake DP	3298	DBAS	8/11/98	9:27:45	4.8	8	3.3	9.6	23.55	8.86	55	0.04	112.5	58	231
Chatcolet Lake DP	3298	DBAS	8/11/98	9:27:45	4.8	7	4.4	9.42	23.38	8.78	54.2	0.03	110.1	120	228
Chatcolet Lake DP	3298	DBAS	8/11/98	9:27:45	4.8	6	5.3	8.93	23.2	8.66	53.8	0.03	104	325	221
Chatcolet Lake DP	3298	DBAS	8/11/98	9:27:45	4.8	5	6.4	5.71	18.37	6.71	46.6	0.03	60.6	212	238
Chatcolet Lake DP	3298	DBAS	8/11/98	9:27:45	4.8	4	7.4	2.52	15.69	6.54	46.5	0.03	25.3	235	212
Chatcolet Lake DP	3298	DBAS	8/11/98	9:27:45	4.8	3	8.4	0.79	14.32	6.51	48.6	0.03	7.7	130	167
Chatcolet Lake DP	3298	DBAS	8/11/98	9:27:45	4.8	2	9.4	0.16	13.28	6.55	55.3	0.04	1.5	116	131
Chatcolet Lake DP	3298	DBAS	8/11/98	9:27:45	4.8	1	10.5	0.16	12.94	6.59	61.1	0.04	1.5	818	118
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	12	0.3	8.99	21.11	8.36	51.6	0.03	100.7	26	192
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	11	0.9	8.92	21.12	8.3	51.7	0.03	100	55	192
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	10	1.9	8.92	21.11	8.29	51.6	0.03	99.9	59	187
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	9	2.9	8.92	21.01	8.22	51.5	0.03	99.7	51	182
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	8	3.9	8.79	20.95	8.13	51.4	0.03	98.2	56	177
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	7	4.9	8.7	20.67	7.89	51.5	0.03	96.7	115	174
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	6	5.9	7.11	20.08	7.27	50.9	0.03	78.1	135	179
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	5	6.9	5.12	19.13	6.9	50.5	0.03	55.2	151	157
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	4	7.9	0.13	15.84	6.61	53.7	0.03	1.3	118	101
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	3	8.9	0.16	13.73	6.66	61.6	0.04	1.5	107	73
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	2	9.9	0.2	13.38	6.68	66.9	0.04	1.9	46	73
Chatcolet Lake DP	3498	DTAS	8/26/98	13:25:04	4.0	1	10.9	0.23	13	6.68	73.2	0.05	2.2	212	77
Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	12	0.3	9.23	22.17	8.35	57.8	0.04	106.1	35	205

Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	11	1	9.3	21.74	8.38	58	0.04	106.1	140	202
Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	10	1.9	9.24	21.49	8.34	57.8	0.04	104.9	142	198
Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	9	2.9	9.07	21.04	8.25	57.3	0.04	102.1	153	193
Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	8	3.9	8.92	20.9	8.09	57.1	0.04	100.2	140	188
Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	7	4.9	7.84	20.63	7.65	56.5	0.04	87.6	235	190
Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	6	5.9	7.39	20.32	7.27	56.6	0.04	82	145	176
Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	5	6.9	2.71	19.35	6.84	55.3	0.04	29.5	129	135
Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	4	7.9	0.1	16.96	6.71	61.7	0.04	1.1	120	74
Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	3	8.9	0.11	14.47	6.74	70.2	0.04	1.1	220	42
Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	2	9.9	0.14	12.87	6.82	86	0.06	1.3	238	36
Chatcolet Lake DP	3598	DTAS	9/2/98	13:51:50	6.1	1	10.9	0.17	12.62	6.81	92.6	0.06	1.6	345	45
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	12	0.3	9.63	14.91	7.82	58.4	0.04	95.2	34	302
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	11	0.6	9.63	14.91	7.79	58.3	0.04	95.2	42	303
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	10	1.6	9.59	14.66	7.72	58.1	0.04	94.2	57	304
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	9	2.6	9.17	14.53	7.62	58.1	0.04	89.9	134	307
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	8	3.5	8.87	14.49	7.53	58.2	0.04	86.8	44	308
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	7	4.5	8.72	14.43	7.49	58.3	0.04	85.2	50	309
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	6	5.6	8.53	14.38	7.48	58.7	0.04	83.2	15	308
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	5	6.6	8.4	14.36	7.53	58.6	0.04	82	52	307
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	4	7.4	8.44	14.35	7.61	58.4	0.04	82.4	54	304
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	3	8.5	9	14.31	7.79	58.7	0.04	87.8	108	300
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	2	9.5	9.11	14	7.97	58.8	0.04	88.2	123	297
Chatcolet Lake DP	4098	KBDB	10/9/98	14:29:00	2.7	1	10.5	8.8	13.68	8.14	58.5	0.04	84.6	358	292
Chatcolet Lake DP	4298	DTASJB	10/19/98	10:05	2.3	11	0.5	9.92	11.4	7.69	57.8	0.04	89.7	48	359
Chatcolet Lake DP	4298	DTASJB	10/19/98	10:05	2.3	10	1.3	9.91	11.4	7.66	57.8	0.04	89.6	37	361
Chatcolet Lake DP	4298	DTASJB	10/19/98	10:05	2.3	9	2.3	10.2	11.38	7.65	57.8	0.04	91.8	11	361
Chatcolet Lake DP	4298	DTASJB	10/19/98	10:05	2.3	8	3.3	9.82	11.38	7.63	58.1	0.04	88.8	48	362
Chatcolet Lake DP	4298	DTASJB	10/19/98	10:05	2.3	7	4.3	9.82	11.38	7.61	58.1	0.04	88.8	37	362
Chatcolet Lake DP	4298	DTASJB	10/19/98	10:05	2.3	6	5.3	9.83	11.38	7.63	58.1	0.04	88.9	44	361
Chatcolet Lake DP	4298	DTASJB	10/19/98	10:05	2.3	5	6.3	9.82	11.36	7.62	57.6	0.04	88.7	41	361
Chatcolet Lake DP	4298	DTASJB	10/19/98	10:05	2.3	4	7.3	9.83	11.31	7.62	57.7	0.04	88.7	44	361
Chatcolet Lake DP	4298	DTASJB	10/19/98	10:05	2.3	3	8.3	9.89	0	7.64	57.8	0.04	89.1	0	359
Chatcolet Lake DP	4298	DTASJB	10/19/98	10:05	2.3	2	9.3	9.92	11.2	7.64	58.1	0.04	89.3	110	360
Chatcolet Lake DP	4298	DTASJB	10/19/98	10:05	2.3	1	10.3	9.82	0	7.58	57.7	0.04	88.4	1837	360
Chatcolet Lake DP	4698	KBAS	11/17/98	10:40:00	2.7	11	0.5	9.87	7.25	7.96	53.5	0.03	82.6	102	383
Chatcolet Lake DP	4698	KBAS	11/17/98	10:40:00	2.7	10	1.5	9.86	7.27	7.94	53.5	0.03	82.5	100	384
Chatcolet Lake DP	4698	KBAS	11/17/98	10:40:00	2.7	9	2.5	9.86	7.24	7.88	53.5	0.03	82.5	104	388
Chatcolet Lake DP	4698	KBAS	11/17/98	10:40:00	2.7	8	3.5	9.84	7.22	7.86	53.3	0.03	82.3	108	389
Chatcolet Lake DP	4698	KBAS	11/17/98	10:40:00	2.7	7	4.5	9.82	7.22	7.82	53.8	0.03	82.1	59	390
Chatcolet Lake DP	4698	KBAS	11/17/98	10:40:00	2.7	6	5.5	9.79	7.2	7.8	53.6	0.03	81.8	54	391
Chatcolet Lake DP	4698	KBAS	11/17/98	10:40:00	2.7	5	6.5	9.8	7.17	7.79	53.6	0.03	104.1	4	391

Chatcolet Lake DP	4698	KBAS	11/17/98	10:40:00	2.7	4	6.5	9.79	0	7.78	53.8	0.03	81.8	40	392
Chatcolet Lake DP	4698	KBAS	11/17/98	10:40:00	2.7	3	7.6	9.79	7.14	7.76	53.3	0.03	81.7	150	392
Chatcolet Lake DP	4698	KBAS	11/17/98	10:40:00	2.7	2	8.5	9.71	7.17	7.73	53.3	0.03	81.1	120	393
Chatcolet Lake DP	4698	KBAS	11/17/98	10:40:00	2.7	1	9.5	9.75	7.1	7.7	52.9	0.03	81.3	913	394

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Chatcolet Lake SH	2098	ASJLDT	5/21/98	12:15:55	0.7	4	0.3	11.8	9.35	6.95	35	0.02	102.8	47	407
Chatcolet Lake SH	2098	ASJLDT	5/21/98	12:15:55	0.7	3	0.3	11.8	9.35	6.96	35	0.02	102.7	109	408
Chatcolet Lake SH	2098	ASJLDT	5/21/98	12:15:55	0.7	2	0.7	11.8	9.37	6.98	35.7	0.02	103.1	122	409
Chatcolet Lake SH	2098	ASJLDT	5/21/98	12:15:55	0.7	1	0.7	11.9	9.37	6.9	35.2	0.02	103.9	203	415
Chatcolet Lake SH	2398	DTJLAS	6/8/98	15:18:55	0.7	4	0.3	10.8	12.77	7.28	39.3	0.03	102.2	25	365
Chatcolet Lake SH	2398	DTJLAS	6/8/98	15:18:55	0.7	3	0.3	10.8	12.79	7.27	39.3	0.03	102	32	365
Chatcolet Lake SH	2398	DTJLAS	6/8/98	15:18:55	0.7	2	0.7	10.8	12.79	7.26	39.3	0.03	102.2	54	373
Chatcolet Lake SH	2398	DTJLAS	6/8/98	15:18:55	0.7	1	0.7	11	12.77	7.24	39.3	0.03	103.4	155	375
Chatcolet Lake SH	2598	DTASBH	6/22/98	12:03	0.8	4	0.2	10.1	16.16	7.3	43.8	0.03	102.8	57	320
Chatcolet Lake SH	2598	DTASBH	6/22/98	12:03	0.8	3	0.2	10.1		7.31	43.7	0.03	102.8	246	316
Chatcolet Lake SH	2598	DTASBH	6/22/98	12:03	0.8	2	0.8	10.2	16.17	7.3	43.8	0.03	103.4	709	339
Chatcolet Lake SH	2598	DTASBH	6/22/98	12:03	0.8	1	0.8	10.4	16.29	7.25	43.7	0.03	105.6	142	333
Chatcolet Lake SH	2798	DTASBH	7/7/98	10:37:02	0.8	4	0.3	11.3	22.86	9.01	52.1	0.03	130.6	101	302
Chatcolet Lake SH	2798	DTASBH	7/7/98	10:37:02	0.8	3	0.3	11.4	22.65	9.02	52.2	0.03	131.3	137	303
Chatcolet Lake SH	2798	DTASBH	7/7/98	10:37:02	0.8	2	0.8	11.8	22.15	8.95	52.4	0.03	134.3	102	308
Chatcolet Lake SH	2798	DTASBH	7/7/98	10:37:02	0.8	1	0.8	11.6	22.06	8.88	52.2	0.03	132.5	510	314
Chatcolet Lake SH	2998	ASBH	7/21/98	12:09:39	0.9	4	0.3	12.1	26.62	9.3	56.2	0.04	149.7	56	259
Chatcolet Lake SH	2998	ASBH	7/21/98	12:09:39	0.9	3	0.3	11.9	26.43	9.3	56.4	0.04	146.9	57	257
Chatcolet Lake SH	2998	ASBH	7/21/98	12:09:39	0.9	2	0.8	12.1	22.66	9.02	54.3	0.03	139.8	159	266
Chatcolet Lake SH	2998	ASBH	7/21/98	12:09:39	0.9	1	0.9	12.6	23.06	9.34	54.2	0.03	146	249	261
Chatcolet Lake SH	3298	DBAS	8/11/98	9:53:29	0.9	3	0.3	8.63	23.31	8.12	62.3	0.04	100.7	57	280
Chatcolet Lake SH	3298	DBAS	8/11/98	9:53:29	0.9	2	0.6	8.32	23.11	7.83	62.3	0.04	96.8	110	284
Chatcolet Lake SH	3298	DBAS	8/11/98	9:53:29	0.9	1	0.9	7.92	22.86	7.62	63.1	0.04	91.8	232	287
Chatcolet Lake SH	3498	DTAS	8/27/98	8:52:58	1.0	4	0.3	8.05	20.02	7.28	59.2	0.04	88.3	28	237
Chatcolet Lake SH	3498	DTAS	8/27/98	8:52:58	1.0	3	0.3	8.05	20.06	7.25	59.3	0.04	88.3	104	237
Chatcolet Lake SH	3498	DTAS	8/27/98	8:52:58	1.0	2	1	8.04	20.04	7.3	59	0.04	88.2	48	232
Chatcolet Lake SH	3498	DTAS	8/27/98	8:52:58	1.0	1	1	8.11	19.94	7.27	59.1	0.04	88.8	103	235
Chatcolet Lake SH	3598	DTAS	9/3/98	11:06:09	0.8	4	0.2	10.3	22.34	8.62	64.7	0.04	119	51	225
Chatcolet Lake SH	3598	DTAS	9/3/98	11:06:09	0.8	3	0.2	10.2	22.33	8.59	64.5	0.04	117.8	57	223

Chatcolet Lake SH	3598	DTAS	9/3/98	11:06:09	0.8	2	0.8	10.4	21.92	8.45	64.6	0.04	119.1	114	218
Chatcolet Lake SH	3598	DTAS	9/3/98	11:06:09	0.8	1	0.8	10.3	21.95	8.37	64.5	0.04	118.2	325	215
Chatcolet Lake SH	4098	KBDB	10/9/98	14:10:00	1.1	3	0.3	9.54	14.06	7.47	61.9	0.04	92.5	103	307
Chatcolet Lake SH	4098	KBDB	10/9/98	14:10:00	1.1	2	0.7	9.9	13.93	7.49	61.7	0.04	95.7	120	308
Chatcolet Lake SH	4098	KBDB	10/9/98	14:10:00	1.1	1	1.1	10.2	13.72	7.5	61.4	0.04	98.1	29	309
Chatcolet Lake SH	4298	DTASJB	10/19/98	10:13:52	0.9	3	0.9	13.7	8.37	9.36	59.8	0.04	115.2	107	313
Chatcolet Lake SH	4298	DTASJB	10/19/98	10:13:52	0.9	2	0.9	13.7		9.33	59.7	0.04	115.3	56	314
Chatcolet Lake SH	4298	DTASJB	10/19/98	10:13:52	0.9	1	0.9	13.7	8.29	9.33	59.9	0.04	115.3	158	314

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
Benewah Lake	1398	DBRP	4/3/98	12:37:53	0.95	10	0.2	11.88	10.32	6.95	34.2	0.02	106.5	43	395
Benewah Lake	1398	DBRP	4/3/98	12:37:53	0.95	9	0.5	11.77	10.3	7.09	34.1	0.02	105.6	114	388
Benewah Lake	1398	DBRP	4/3/98	12:37:53	0.95	8	1	11.75	10.25	7.12	34.1	0.02	105.2	52	386
Benewah Lake	1398	DBRP	4/3/98	12:37:53	0.95	7	1.5	11.72	10.25	6.96	33.9	0.02	105	120	394
Benewah Lake	1398	DBRP	4/3/98	12:37:53	0.95	6	2	11.44	9.82	6.98	34.1	0.02	101.4	125	391
Benewah Lake	1398	DBRP	4/3/98	12:37:53	0.95	5	2.5	11.48	8.78	6.93	33.9	0.02	99.2	54	392
Benewah Lake	1398	DBRP	4/3/98	12:37:53	0.95	4	3	11.3	8.47	6.91	33.9	0.02	97	58	391
Benewah Lake	1398	DBRP	4/3/98	12:37:53	0.95	3	3.5	11.26	8.35	6.81	34	0.02	96.4	49	395
Benewah Lake	1398	DBRP	4/3/98	12:37:53	0.95	2	4	11.13	8.17	6.78	33.9	0.02	94.8	107	396
Benewah Lake	1398	DBRP	4/3/98	12:37:53	0.95	1	4.4	10.68	7.76	6.72	34.1	0.02	90.1	214	403
Benewah Lake	1698	DBASRP	4/21/98	11:47:22	1.0	8	0.3	10.84	14.46	6.96	36.8	0.02	106	222	384
Benewah Lake	1698	DBASRP	4/21/98	11:47:22	1.0	7	1	10.84	12.38	6.82	36.4	0.02	101.2	237	398
Benewah Lake	1698	DBASRP	4/21/98	11:47:22	1.0	6	1.5	10.81	12.05	6.9	36.4	0.02	100.2	202	391
Benewah Lake	1698	DBASRP	4/21/98	11:47:22	1.0	5	2	10.64	11.76	6.82	36.5	0.02	97.9	212	392
Benewah Lake	1698	DBASRP	4/21/98	11:47:22	1.0	4	2.5	10.53	11.29	6.75	36.3	0.02	95.9	104	389
Benewah Lake	1698	DBASRP	4/21/98	11:47:22	1.0	3	3	10.09	10.18	6.6	36.7	0.02	89.5	140	392
Benewah Lake	1698	DBASRP	4/21/98	11:47:22	1.0	2	3.5	9.31	9.26	6.56	36.8	0.02	80.8	204	390
Benewah Lake	1698	DBASRP	4/21/98	11:47:22	1.0	1	4	7.42	8.82	6.53	37.1	0.02	63.7	302	400
Benewah Lake	2098	ASJLDT	5/21/98	13:35:46	3.2	9	0.4	10.3	15.33	7.01	37.1	0.02	103.1	35	408
Benewah Lake	2098	ASJLDT	5/21/98	13:35:46	3.2	8	1	10.28	15.21	7.01	37.1	0.02	102.7	39	408
Benewah Lake	2098	ASJLDT	5/21/98	13:35:46	3.2	7	1.5	10.27	15.14	7.01	37.1	0.02	102.5	58	407
Benewah Lake	2098	ASJLDT	5/21/98	13:35:46	3.2	6	2	10.27	15.09	6.98	37.2	0.02	102.3	48	407
Benewah Lake	2098	ASJLDT	5/21/98	13:35:46	3.2	5	2.5	9.62	13.77	6.71	38.1	0.02	93.1	57	419
Benewah Lake	2098	ASJLDT	5/21/98	13:35:46	3.2	4	3	9.71	12.2	6.73	37.4	0.02	90.7	125	414
Benewah Lake	2098	ASJLDT	5/21/98	13:35:46	3.2	3	3.5	8.55	11.41	6.52	37.8	0.02	78.5	57	420
Benewah Lake	2098	ASJLDT	5/21/98	13:35:46	3.2	2	4	7.96	11.07	6.52	38.7	0.02	72.4	427	418
Benewah Lake	2098	ASJLDT	5/21/98	13:35:46	3.2	1	4.5	5	10.51	6.21	40.1	0.03	44.9	331	429

Benewah Lake	2398	DTJLAS	6/8/98	15:00:18	1.4	10	0.4	9.88	19.44	7.32	40.3	0.03	107.5	28	365
Benewah Lake	2398	DTJLAS	6/8/98	15:00:18	1.4	9	1	9.82	17.07	7.25	39.9	0.03	101.8	39	369
Benewah Lake	2398	DTJLAS	6/8/98	15:00:18	1.4	8	1.5	9.77	15.99	7.09	39.9	0.03	99.1	44	374
Benewah Lake	2398	DTJLAS	6/8/98	15:00:18	1.4	7	2	9.55	13.82	6.93	39.1	0.03	92.4	28	377
Benewah Lake	2398	DTJLAS	6/8/98	15:00:18	1.4	6	2.5	8.69	13.09	6.82	38.9	0.02	82.7	35	379
Benewah Lake	2398	DTJLAS	6/8/98	15:00:18	1.4	5	3	7.03	11.87	6.68	38.7	0.02	65	110	381
Benewah Lake	2398	DTJLAS	6/8/98	15:00:18	1.4	4	3.5	6.5	10.66	6.61	38.9	0.02	58.5	21	380
Benewah Lake	2398	DTJLAS	6/8/98	15:00:18	1.4	3	4	6.4	10.45	6.6	38.6	0.02	57.3	42	378
Benewah Lake	2398	DTJLAS	6/8/98	15:00:18	1.4	2	4.5	4.95	9.89	6.55	40	0.03	43.8	135	376
Benewah Lake	2398	DTJLAS	6/8/98	15:00:18	1.4	1	4.8	4.13	9.84	6.56	41	0.03	36.4	205	388
Benewah Lake	2598	DTASBH	6/22/98	10:35	2.8	8	0.4	10.17	20.46	7.71	40.9	0.03	112.9	38	330
Benewah Lake	2598	DTASBH	6/22/98	10:35	2.8	7	1	10.41	19.56	7.69	40.8	0.03	113.5	126	331
Benewah Lake	2598	DTASBH	6/22/98	10:35	2.8	6	1.5	10.87	17.71	7.55	40.8	0.03	114.3	203	334
Benewah Lake	2598	DTASBH	6/22/98	10:35	2.8	5	2	10.53	16.95	7.36	41	0.03	109	208	336
Benewah Lake	2598	DTASBH	6/22/98	10:35	2.8	4	2.5	10.42	15.99	7.22	41.1	0.03	105.6	201	336
Benewah Lake	2598	DTASBH	6/22/98	10:35	2.8	3	3	10.39	15.47	7.18	41.2	0.03	104.2	232	335
Benewah Lake	2598	DTASBH	6/22/98	10:35	2.8	2	3.5	7.77	14.18	6.79	40.3	0.03	75.7	320	336
Benewah Lake	2598	DTASBH	6/22/98	10:35	2.8	1	4.5	0.38	11.25	6.29	50.4	0.03	3.5	519	332
Benewah Lake	2798	DTASBH	7/7/98	6:47:21	3.2	10	0.3	10.28	23.49	8.55	49.7	0.03	120.5	40	356
Benewah Lake	2798	DTASBH	7/7/98	6:47:21	3.2	9	0.7	10.19	23.15	8.49	49.3	0.03	118.6	111	358
Benewah Lake	2798	DTASBH	7/7/98	6:47:21	3.2	8	1.2	10.12	22.93	8.44	49.4	0.03	117.3	48	359
Benewah Lake	2798	DTASBH	7/7/98	6:47:21	3.2	7	1.7	10.2	22.52	8.25	50.1	0.03	117.3	125	365
Benewah Lake	2798	DTASBH	7/7/98	6:47:21	3.2	6	2.2	10.85	21.85	8.21	49.9	0.03	123.2	107	366
Benewah Lake	2798	DTASBH	7/7/98	6:47:21	3.2	5	2.7	11	20.35	7.76	50.1	0.03	121.3	140	372
Benewah Lake	2798	DTASBH	7/7/98	6:47:21	3.2	4	3.2	10.47	18.18	7.41	48.5	0.03	110.6	153	375
Benewah Lake	2798	DTASBH	7/7/98	6:47:21	3.2	3	3.7	10.6	15.96	7.37	47.3	0.03	106.9	309	369
Benewah Lake	2798	DTASBH	7/7/98	6:47:21	3.2	2	4.2	3.79	13.73	6.56	50.1	0.03	36.4	204	368
Benewah Lake	2798	DTASBH	7/7/98	6:47:21	3.2	1	4.7	0.31	12.44	6.35	60.1	0.04	2.9	232	355
Benewah Lake	2998	ASBH	7/21/98	10:47:28	4.1	10	0.3	9.2	25.92	8.41	50.1	0.03	112.8	103	254
Benewah Lake	2998	ASBH	7/21/98	10:47:28	4.1	9	0.8	9.22	25.86	8.41	50.1	0.03	112.9	131	251
Benewah Lake	2998	ASBH	7/21/98	10:47:28	4.1	8	1.3	9.28	25.36	8.47	50.3	0.03	112.6	59	245
Benewah Lake	2998	ASBH	7/21/98	10:47:28	4.1	7	1.8	9.59	24.9	8.53	50.1	0.03	115.4	109	238
Benewah Lake	2998	ASBH	7/21/98	10:47:28	4.1	6	2.3	9.24	24.64	8.45	50.1	0.03	110.7	20	232
Benewah Lake	2998	ASBH	7/21/98	10:47:28	4.1	5	2.8	9.22	24.35	8.51	50.2	0.03	109.9	110	218
Benewah Lake	2998	ASBH	7/21/98	10:47:28	4.1	4	3.5	10.19	20.83	7.63	48.2	0.03	113.5	113	229
Benewah Lake	2998	ASBH	7/21/98	10:47:28	4.1	3	3.8	10.48	18.85	7.86	46.8	0.03	112.4	115	209
Benewah Lake	2998	ASBH	7/21/98	10:47:28	4.1	2	4.3	9.77	16.69	7.75	49.5	0.03	100.2	248	199
Benewah Lake	2998	ASBH	7/21/98	10:47:28	4.1	1	4.8	0.35	13.6	6.48	69.4	0.04	3.3	314	186
Benewah Lake	3298	DBAS	8/11/98	11:35:09	2.7	10	0.4	10.35	25.42	9.11	54.8	0.04	125.5	101	248
Benewah Lake	3298	DBAS	8/11/98	11:35:09	2.7	9	0.9	10.77	23.91	9.17	54.5	0.03	127.1	102	245

Benewah Lake	3298	DBAS	8/11/98	11:35:09	2.7	8	1.4	10.7	23.6	9.14	54.5	0.03	125.6	40	240
Benewah Lake	3298	DBAS	8/11/98	11:35:09	2.7	7	1.9	10.51	23.53	9.09	54.4	0.03	123.2	54	238
Benewah Lake	3298	DBAS	8/11/98	11:35:09	2.7	6	2.4	10.6	23.47	9.1	54.4	0.03	124.2	52	231
Benewah Lake	3298	DBAS	8/11/98	11:35:09	2.7	5	2.9	10.42	23.37	9.01	54.1	0.03	121.8	58	225
Benewah Lake	3298	DBAS	8/11/98	11:35:09	2.7	4	3.4	9.89	23.15	8.74	53.8	0.03	115.1	108	219
Benewah Lake	3298	DBAS	8/11/98	11:35:09	2.7	3	3.9	9	22.75	7.65	53.7	0.03	104	128	230
Benewah Lake	3298	DBAS	8/11/98	11:35:09	2.7	2	4.4	4.94	19.14	6.9	56.8	0.04	53.2	321	248
Benewah Lake	3298	DBAS	8/11/98	11:35:09	2.7	1	4.9	0.17	17.42	6.57	69	0.04	1.8	359	196
Benewah Lake	3498	DTAS	8/27/98	9:04:12	3.3	10	0.4	9.3	20.88	8.53	52	0.03	103.7	31	224
Benewah Lake	3498	DTAS	8/27/98	9:04:12	3.3	9	1	9.29	20.67	8.49	51.9	0.03	103.2	108	226
Benewah Lake	3498	DTAS	8/27/98	9:04:12	3.3	8	1.5	9.24	20.62	8.47	51.8	0.03	102.6	49	222
Benewah Lake	3498	DTAS	8/27/98	9:04:12	3.3	7	2	9.32	20.56	8.47	51.8	0.03	103.4	49	218
Benewah Lake	3498	DTAS	8/27/98	9:04:12	3.3	6	2.5	9.38	20.48	8.44	52.2	0.03	103.7	112	214
Benewah Lake	3498	DTAS	8/27/98	9:04:12	3.3	5	3	8.95	20.28	8.04	52.2	0.03	98.7	111	216
Benewah Lake	3498	DTAS	8/27/98	9:04:12	3.3	4	3.5	8.71	20.23	7.76	52.6	0.03	95.9	128	220
Benewah Lake	3498	DTAS	8/27/98	9:04:12	3.3	3	4	7.72	20.04	7.28	52.9	0.03	84.7	124	225
Benewah Lake	3498	DTAS	8/27/98	9:04:12	3.3	2	4.5	2.98	19.71	6.79	54.8	0.04	32.4	223	218
Benewah Lake	3498	DTAS	8/27/98	9:04:12	3.3	1	4.9	0.14	18.46	6.6	75.7	0.05	1.4	322	163
Benewah Lake	3598	DTAS	9/3/98	11:34:53	4.1	9	0.4	9.9	22.22	8.5	57.9	0.04	114	101	228
Benewah Lake	3598	DTAS	9/3/98	11:34:53	4.1	8	1	9.87	21.76	8.41	57.9	0.04	112.6	41	224
Benewah Lake	3598	DTAS	9/3/98	11:34:53	4.1	7	1.5	9.85	21.46	8.35	57.7	0.04	111.8	58	221
Benewah Lake	3598	DTAS	9/3/98	11:34:53	4.1	6	2	9.56	21.37	8.13	57.6	0.04	108.3	103	221
Benewah Lake	3598	DTAS	9/3/98	11:34:53	4.1	5	2.5	9.44	21.23	7.93	57.7	0.04	106.6	102	220
Benewah Lake	3598	DTAS	9/3/98	11:34:53	4.1	4	3	9.22	21.09	7.66	57.5	0.04	103.8	41	221
Benewah Lake	3598	DTAS	9/3/98	11:34:53	4.1	3	3.5	9.07	20.93	7.57	57.7	0.04	101.9	124	218
Benewah Lake	3598	DTAS	9/3/98	11:34:53	4.1	2	4	8.84	20.53	7.52	58.9	0.04	98.6	241	204
Benewah Lake	3598	DTAS	9/3/98	11:34:53	4.1	1	4.7	2.07	19.28	6.67	69.3	0.04	22.5	329	207
Benewah Lake	4098	KBDB	10/9/98	13:33:00	2.0	7	0.3	9.7	13.39	7.37	55.4	0.04	92.7	120	299
Benewah Lake	4098	KBDB	10/9/98	13:33:00	2.0	6	1	9.47	12.96	7.34	55.3	0.04	89.5	117	305
Benewah Lake	4098	KBDB	10/9/98	13:33:00	2.0	5	1.6	9.2	12.89	7.27	54.9	0.04	86.9	53	305
Benewah Lake	4098	KBDB	10/9/98	13:33:00	2.0	4	2.2	9.23	12.81	7.27	55.2	0.04	87	105	304
Benewah Lake	4098	KBDB	10/9/98	13:33:00	2.0	3	2.6	9.22	12.78	7.26	55.1	0.04	86.8	110	303
Benewah Lake	4098	KBDB	10/9/98	13:33:00	2.0	2	3.2	9.62	12.73	7.28	55.3	0.04	90.5	244	302
Benewah Lake	4098	KBDB	10/9/98	13:33:00	2.0	1	3.7	8.88	12.69	7.09	55.1	0.04	83.5	320	301

Location	Phase	Samplers	Date	Time	Secchi (m)	Sequence	Depth (m)	Dissolved Oxygen (mg/L)	Temperature (C)	pH	Conductivity (µs/cm)	TDS	Saturated Dissolved Oxygen	Stabilization Time	Redox
St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	12	0.4	12.6	5.98	7.03	41.8	0.03	101.7	46	392
St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	11	2.1	12.4	5.98	7.04	41.9	0.03	100.1	629	392
St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	10	3.2	12.4	6	7.02	41.9	0.03	100.1	458	396

St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	9	4.2	12.4	5.98	7.02	41.9	0.03	100.3	821	398
St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	8	5.1	12.7	5.97	7.03	42	0.03	102.3	26	402
St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	7	6.1	12.6	5.97	7.04	41.9	0.03	101.8	44	403
St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	6	7.1	12.6	5.97	7.02	41.9	0.03	101.5	50	404
St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	5	8.3	12.6	5.98	7.01	42	0.03	101.5	104	405
St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	4	9.2	12.7	5.98	7.02	41.9	0.03	102.2	128	406
St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	3	10.3	12.7	5.97	7.02	42.1	0.03	102.1	34	408
St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	2	11.2	12.8	5.97	7.03	42	0.03	102.8	25	408
St. Joe River	1398	DBRP	4/3/98	11:51:33	3.5	1	12.3	12.8	5.97	7.05	42	0.03	103.4	131	408
St. Joe River	1698	DBASRP	4/21/98	11:16:26	4.5	11	0.4	11.8	7.94	6.97	43.7	0.03	98.7	142	412
St. Joe River	1698	DBASRP	4/21/98	11:16:26	4.5	10	1.3	11.8	7.92	6.93	43.7	0.03	99.1	53	419
St. Joe River	1698	DBASRP	4/21/98	11:16:26	4.5	9	2.2	11.8	7.94	6.92	43.8	0.03	99.2	126	421
St. Joe River	1698	DBASRP	4/21/98	11:16:26	4.5	8	3.3	11.8	7.94	6.93	43.7	0.03	99.2	104	422
St. Joe River	1698	DBASRP	4/21/98	11:16:26	4.5	7	4.3	11.8	7.91	6.93	44	0.03	99.1	103	424
St. Joe River	1698	DBASRP	4/21/98	11:16:26	4.5	6	5.3	11.8	7.91	6.9	43.7	0.03	99.1	52	427
St. Joe River	1698	DBASRP	4/21/98	11:16:26	4.5	5	6.2	11.8	7.91	6.88	43.7	0.03	99.1	125	429
St. Joe River	1698	DBASRP	4/21/98	11:16:26	4.5	4	6.9	11.8	7.91	6.87	43.7	0.03	99	124	431
St. Joe River	1698	DBASRP	4/21/98	11:16:26	4.5	3	8.1	11.8	7.92	6.85	43.9	0.03	99.4	159	433
St. Joe River	1698	DBASRP	4/21/98	11:16:26	4.5	2	9.6	11.9	7.94	6.79	43.6	0.03	99.7	134	437
St. Joe River	1698	DBASRP	4/21/98	11:16:26	4.5	1	10.3	11.9	7.94	6.72	43.7	0.03	100.1	212	441
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	12	0.4	11.8	9.76	7.05	35.4	0.02	104	134	400
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	11	1.3	11.7	9.76	7.06	35.4	0.02	103.3	109	402
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	10	2.3	11.7	9.78	7.11	35.4	0.02	103.4	55	402
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	9	3.3	11.7	9.76	7.08	35.4	0.02	103.5	115	404
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	8	4.3	11.7	9.74	7.08	35.4	0.02	103.6	102	405
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	7	5.3	11.8	9.74	7.06	35.5	0.02	103.7	113	406
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	6	6.3	11.7	9.74	7.04	35.5	0.02	103.1	129	407
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	5	7.3	11.7	9.73	7.07	35.4	0.02	103.5	116	406
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	4	8.2	11.7	9.76	7.06	35.5	0.02	103.4	142	406
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	3	9.2	11.8	9.73	7.07	35.4	0.02	103.7	139	406
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	2	10.2	11.7	9.76	7.01	35.4	0.02	103.5	255	409
St. Joe River	2098	ASJLDT	5/21/98	12:56:22	4.0	1	11.2	11.8	9.73	7	35.5	0.02	104.1	337	411
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	14	0.3	11	12.27	7.34	39.4	0.03	103.1	28	370
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	13	1.1	11	12.23	7.35	39.4	0.03	102.9	42	371
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	12	2.1	11	12.21	7.34	39.4	0.03	102.6	57	372
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	11	3.1	11	12.26	7.34	39.5	0.03	102.6	38	373
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	10	4.1	11	12.2	7.34	39.5	0.03	102.5	53	373
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	9	5.1	11	12.18	7.34	39.4	0.03	102.4	133	373
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	8	6.1	11	12.13	7.32	39.5	0.03	102.3	44	374
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	7	7.1	11	12.12	7.33	39.6	0.03	102.4	48	374
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	6	8.1	11	12.16	7.33	39.6	0.03	102.1	59	374

St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	5	9.1	11	12.11	7.32	39.4	0.03	102.4	47	375
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	4	10.1	11	12.15	7.32	39.6	0.03	102.1	122	375
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	3	11.1	11	12.13	7.31	39.7	0.03	102.6	35	376
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	2	12.1	11	12.15	7.31	39.6	0.03	102.4	43	377
St. Joe River	2398	DTJLAS	6/8/98	14:34:30	4.4	1	13.1	10.9	12.16	7.3	39.6	0.03	101.6	223	377
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	12	0.3	9.85	15.1	7.24	43.9	0.03	98	36	360
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	11	1.8	9.84	15.02	7.24	44	0.03	97.7	57	362
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	10	2.8	9.84	14.97	7.23	44	0.03	97.6	130	362
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	9	3.8	9.85		7	44	0.03	97.5	128	362
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	8	4.8	9.84	14.87	7.23	43.9	0.03	97.3	205	362
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	7	5.8	9.84	14.86	7.22	43.8	0.03	97.4	220	363
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	6	6.8	9.85	14.86	7.22	44	0.03	97.5	122	363
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	5	7.8	9.87	14.86	7.22	43.9	0.03	97.7	143	363
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	4	8.8	9.88	14.84	7.22	43.8	0.03	97.7	224	364
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	3	9.8	9.89	14.87	7.22	43.9	0.03	97.9	205	364
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	2	10.8	9.91	14.87	7.21	43.9	0.03	98.1	122	364
St. Joe River	2598	DTASBH	6/22/98	10:22:51	4.1	1	11.8	9.96	14.84	7.2	43.9	0.03	98.5	227	365
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	13	0.3	9.13	20.97	7.39	53.5	0.03	101.9	134	362
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	12	1.2	9.24	20.51	7.34	53.3	0.03	102.2	124	367
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	11	2.2	9.21	20.15	7.31	53.2	0.03	101.2	134	370
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	10	3.2	9.16	19.94	7.31	53.2	0.03	100.2	140	372
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	9	4.2	9.16	19.9	7.29	53.2	0.03	100.1	235	373
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	8	5.2	9.17	19.85	7.29	53	0.03	100.1	130	374
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	7	6.2	9.16	19.8	7.29	53.3	0.03	99.9	146	375
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	6	7.2	9.07	19.38	7.26	53.1	0.03	98.1	130	377
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	5	8.2	9	19.19	7.24	53.2	0.03	97.1	119	378
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	4	9.2	9.01	19.19	7.23	53.6	0.03	97.2	103	380
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	3	10.2	9.03	19.21	7.23	53	0.03	97.3	112	381
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	2	11.2	9.01	19.19	7.23	53	0.03	97.2	201	382
St. Joe River	2798	DTASBH	7/7/98	9:26:52	4.0	1	12.2	9.06	19.19	7.23	53	0.03	97.7	220	383
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	13	0.5	8.52	22.77	7.28	54.9	0.04	98.6	140	325
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	12	1.5	8.51	21.99	7.27	54.7	0.04	96.9	117	326
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	11	2.5	8.46	21.79	7.26	54.7	0.04	96.1	130	326
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	10	3.5	8.43	21.69	7.25	54.5	0.03	95.5	120	326
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	9	4.5	8.36	21.51	7.24	54.8	0.04	94.4	117	326
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	8	5.5	8.25	21.37	7.2	54.6	0.03	92.9	122	326
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	7	6.5	8.17	21.26	7.18	54.6	0.03	91.9	141	326
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	6	7.5	8.12	21.18	7.15	54.6	0.04	91.1	114	327
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	5	8.5	7.95	20.95	7.13	54.4	0.03	88.8	129	326
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	4	9.5	7.74	20.63	7.08	54.2	0.03	86	58	327
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	3	10.5	7.54	20.48	7.04	54.6	0.03	83.5	57	327

St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	2	11.5	7.53	20.28	7.03	54.2	0.03	83	111	327
St. Joe River	2998	ASBH	7/21/98	10:31:40	3.9	1	12.5	7.26	20.21	6.99	54.6	0.03	79.9	414	327
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	13	0.4	7.89	22.59	7.31	60.8	0.04	91.3	56	290
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	12	1.2	7.54	22.15	7.22	60.9	0.04	86.5	122	294
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	11	2.2	7.38	21.83	7.2	60.8	0.04	84.2	139	294
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	10	3.2	7.28	21.67	7.17	60.6	0.04	82.8	143	295
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	9	4.2	7.23	21.62	7.19	60.6	0.04	82.2	218	293
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	8	5.2	7.22	21.58	7.18	60.8	0.04	82	219	291
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	7	6.2	7.2	21.53	7.16	60.9	0.04	81.6	58	290
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	6	7.2	7.17	21.51	7.16	60.8	0.04	81.3	145	289
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	5	8.2	7.16	21.49	7.16	60.8	0.04	81.2	141	288
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	4	9.2	7.08	21.48	7.15	61	0.04	80.2	123	286
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	3	10.2	7.03	21.46	7.14	60.9	0.04	79.6	126	285
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	2	11.2	6.96	21.44	7.13	61	0.04	78.8	133	283
St. Joe River	3498	ASGL	8/26/98	12:44:53	4.0	1	12.2	6.92	21.42	7.13	60.6	0.04	78.3	529	281
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	13	0.3	7.89	21.6	7.25	65.2	0.04	89.7	19	281
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	12	1.7	7.84	20.93	7.22	65	0.04	88	21	281
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	11	2.7	7.7	20.72	7.21	64.9	0.04	86.2	20	281
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	10	3.7	7.68	20.7	7.16	65.1	0.04	85.8	17	283
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	9	4.7	7.65	20.7	7.15	65.2	0.04	85.5	28	283
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	8	5.7	7.55	20.65	7.13	64.8	0.04	84.3	15	282
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	7	6.7	7.5	20.65	7.14	65.2	0.04	83.8	19	281
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	6	7.7	7.35	20.65	7.12	65	0.04	82.1	29	281
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	5	8.7	7.33	20.63	7.11	65.3	0.04	81.9	44	280
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	4	9.7	7.18	20.6	7.08	65.3	0.04	80.1	42	280
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	3	10.7	6.83	20.53	7.03	65.4	0.04	76.1	54	278
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	2	11.7	6.35	20.39	6.99	65.9	0.04	70.6	54	276
St. Joe River	3598	DTAS	9/3/98	12:00:53	4.1	1	12.7	5.75	20.28	6.93	67.1	0.04	63.8	157	274
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	14	0.3	9.26	14.01	7.33	61.7	0.04	89.7	48	329
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	13	0.6	9.21	14	7.31	61.7	0.04	89.1	130	330
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	12	1.6	9.11	13.93	7.28	61.5	0.04	88	49	331
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	11	2.6	8.97	13.77	7.23	61.5	0.04	86.4	110	333
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	10	3.5	8.96	13.76	7.23	61.6	0.04	86.3	54	333
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	9	4.5	8.96	13.75	7.22	61.6	0.04	86.3	105	333
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	8	5.4	8.96	13.75	7.22	61.5	0.04	86.3	126	333
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	7	6.5	8.96	13.75	7.22	61.8	0.04	86.3	121	332
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	6	7.6	8.96	13.75	7.22	61.6	0.04	86.3	137	331
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	5	8.6	8.96	13.75	7.22	61.4	0.04	86.3	113	331
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	4	9.5	8.94	13.75	7.23	61.8	0.04	86.1	120	330
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	3	10.1	8.94	13.73	7.22	61.5	0.04	86	217	331
St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	2	11.6	8.95	13.73	7.21	61.4	0.04	86.2	155	331

St. Joe River	4098	KBDB	10/9/98	12:58:00	2.8	1	12.6	8.96	13.73	7.19	61.8	0.04	86.3	338	332
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	12	0.5	9.79	10.66	7.29	60	0.04	87	129	355
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	11	1.6	9.78	0	7.27	60.1	0.04	86.5	31	357
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	10	2.6	9.75	10.4	7.27	59.9	0.04	86.2	42	357
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	9	3.6	9.74	10.4	7.26	59.9	0.04	86.1	34	358
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	8	4.6	9.73	10.36	7.23	60.2	0.04	85.9	32	359
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	7	5.6	9.73	10.35	7.25	59.9	0.04	85.8	32	358
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	6	6.6	9.72	10.35	7.24	60	0.04	85.7	35	358
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	5	7.6	9.73	10.33	7.25	60.2	0.04	85.9	34	357
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	4	8.6	9.73	10.35	7.25	60.1	0.04	85.8	31	357
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	3	9.6	9.74	10.33	7.25	60.2	0.04	86	42	356
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	2	10.6	9.63	10.2	7.25	59.9	0.04	84.7	517	356
St. Joe River	4298	DTASJB	10/19/98	10:41:51	2.6	1	10.6	9.82	10.22	7.33	59.9	0.04	86.4	122	353
St. Joe River	4698	KB AS	11/17/98	9:48:00	3.6	10	0.5	9.68	5.24	7.19	53.9	0.03	77	110	401
St. Joe River	4698	KB AS	11/17/98	9:48:00	3.6	9	1.7	9.68	5.26	7.19	54	0.03	77	49	402
St. Joe River	4698	KB AS	11/17/98	9:48:00	3.6	8	2.7	9.66	5.29	7.16	53.9	0.03	77	48	405
St. Joe River	4698	KB AS	11/17/98	9:48:00	3.6	7	3.7	9.66	5.29	7.15	53.8	0.03	77	103	405
St. Joe River	4698	KB AS	11/17/98	9:48:00	3.6	6	4.7	9.67	5.27	7.16	53.8	0.03	77	52	405
St. Joe River	4698	KB AS	11/17/98	9:48:00	3.6	5	5.7	9.68	5.29	7.16	53.8	0.03	77.1	49	405
St. Joe River	4698	KB AS	11/17/98	9:48:00	3.6	4	6.7	9.7	5.24	7.16	54.2	0.03	77.1	100	406
St. Joe River	4698	KB AS	11/17/98	9:48:00	3.6	3	7.7	9.7	5.24	7.16	54.1	0.03	77.1	107	407
St. Joe River	4698	KB AS	11/17/98	9:48:00	3.6	2	8.7	9.72	5.22	7.15	54.1	0.03	77.3	117	409
St. Joe River	4698	KB AS	11/17/98	9:48:00	3.6	1	9.7	9.65	5.29	7.14	54	0.03	76.9	857	410

Appendix B

Water quality results from Coeur d'Alene Lake during 1997 and 1998.

Appendix B.1 Nitrate (µg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1997.

	Date	
Location	10/20/97	11/4/97
Rockford Bay	113	53
Windy Bay Shallow	<5	59
Windy Bay Deep	<5	53
Coeur d'Alene River	<5	<5
Mid Lake Coeur d'Alene	<5	49
Carey Bay	<5	<5
Conkling Point	<5	<5
Hidden Lake	<5	<5
Round Lake	<5	67
Chatcolet Lake Deep	<5	<5
Chatcolet Lake Shallow	<5	43
Benewah Lake	<5	-
St. Joe River	<5	66

- No samples taken to Spokane Tribal Laboratory.

Appendix B.2 Nitrate (µg/L) results from the hypolimnion taken at ten stations on Coeur d'Alene Lake, Idaho, 1997.

	Date	
Location	10/20/97	11/4/97
Rockford Bay	<5	50
Windy Bay Shallow	<5	63
Windy Bay Deep	131	75
Coeur d'Alene River	<5	101
Mid Lake Coeur d'Alene	54	128
Carey Bay	<5	92
Conkling Point	<5	125
Hidden Lake	<5	<5
Chatcolet Lake Deep	<5	<5
St. Joe River	<5	<5

Appendix B.3 Nitrate (µg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1998.

	Date						
Location	4/28/98	6/26/98	7/8/98	8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	33	<5	<5	<5	<5	<5	<5
Windy Bay Shallow	53	<5	<5	<5	<5	<5	<5
Windy Bay Deep	37	<5	<5	<5	<5	<5	<5
Coeur d'Alene River	8	<5	<5	<5	<5	39	6
Mid Lake Coeur d'Alene	<5	<5	<5	<5	<5	<5	7
Carey Bay	16	<5	<5	<5	<5	<5	35
Conkling Point	57	<5	<5	<5	<5	<5	18
Hidden Lake	210	<5	<5	<5	<5	<5	<5
Round Lake	8	<5	<5	<5	<5	<5	-
Chatcolet Lake Deep	<5	<5	<5	<5	<5	<5	<5
Chatcolet Lake Shallow	-	<5	<5	<5	<5	<5	-
Benewah Lake	<5	<5	<5	<5	<5	-	-
St. Joe River	<5	<5	<5	<5	<5	<5	6

-No samples taken to Spokane Tribal Lab.

Appendix B.4 Nitrate (µg/L) results from the hypolimnion taken at eleven stations on Coeur d'Alene Lake, Idaho, 1998.

	Date						
Location	4/28/98	6/26/98	7/8/98	8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	50	<5	<5	<5	<5	<5	<5
Windy Bay Shallow	52	<5	<5	<5	<5	<5	<5
Windy Bay Deep	49	<5	<5	<5	29	39	51
Coeur d'Alene River	19	<5	<5	<5	<5	<5	28
Mid Lake Coeur d'Alene	62	<5	<5	<5	<5	78	65
Carey Bay	8	<5	<5	<5	<5	<5	11
Conkling Point	36	<5	<5	<5	<5	<5	16
Hidden Lake	<5	<5	<5	<5	<5	-	<5
Chatcolet Lake Deep	21	<5	<5	<5	<5	<5	<5
Benewah Lake	<5	<5	<5	<5	<5	-	-
St. Joe River	<5	<5	<5	<5	<5	<5	6

-No samples taken to Spokane Tribal Lab.

Appendix B.5 Nitrite (µg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1997.

Location	Date 10/20/97	11/4/97
Rockford Bay	<29	<29
Windy Bay Shallow	<29	<29
Windy Bay Deep	<29	<29
Coeur d'Alene River	<29	<29
Mid Lake Coeur d'Alene	<29	<29
Carey Bay	<29	<29
Conkling Point	<29	<29
Hidden Lake	<29	<29
Round Lake	<29	<29
Chatcolet Lake Deep	<29	<29
Chatcolet Lake Shallow	<29	<29
Benewah Lake	<29	-
St. Joe River	<29	<29

- No sample taken to Spokane Tribal Laboratory.

Appendix B.6 Nitrite (µg/L) results from the hypolimnion taken at ten stations on Coeur d'Alene Lake, Idaho, 1997.

Location	Date 10/20/97	11/4/97
Rockford Bay	<29	<29
Windy Bay Shallow	<29	<29
Windy Bay Deep	<29	<29
Coeur d'Alene River	<29	<29
Mid Lake Coeur d'Alene	<29	<29
Carey Bay	<29	<29
Conkling Point	<29	<29
Hidden Lake	<29	<29
Chatcolet Lake Deep	<29	<29
St. Joe River	<29	<29

Appendix B.7 Nitrite (µg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1998.

Location	Date 4/28/98	6/26/98	7/8/98	8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	<29	<29	<10	<10	<10	<10	<10
Windy Bay Shallow	<29	<29	<10	<10	<10	<10	<10
Windy Bay Deep	<29	<29	<10	<10	<10	<10	<10
Coeur d'Alene River	<29	<29	<10	<10	<10	<10	<10
Mid Lake Coeur d'Alene	<29	<29	<10	<10	<10	<10	<10
Carey Bay	<29	<29	<10	<10	<10	<10	<10
Conkling Point	<29	<29	<10	<10	<10	<10	<10
Hidden Lake	<29	<29	<10	<10	<10	<10	<10
Round Lake	<29	<29	<10	<10	<10	<10	<10
Chatcolet Lake Deep	<29	<29	<10	<10	<10	<10	<10
Chatcolet Lake Shallow	-	<29	<10	<10	<10	<10	<10
Benewah Lake	<29	<29	<10	<10	<10	-	-
St. Joe River	<29	<29	<10	<10	<10	<10	<10

-No samples taken to Spokane Tribal Lab.

Appendix B.8 Nitrite (µg/L) results from the hypolimnion taken at eleven stations on Coeur d'Alene Lake, Idaho, 1998.

Location	Date 4/28/98	6/26/98	7/8/98	8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	<29	<29	<10	<10	<10	<10	<10
Windy Bay Shallow	<29	<29	<10	<10	<10	<10	<10
Windy Bay Deep	<29	<29	<10	<10	<10	<10	<10
Coeur d'Alene River	<29	<29	<10	<10	<10	<10	<10
Mid Lake Coeur d'Alene	<29	<29	<10	<10	<10	<10	<10
Carey Bay	<29	<29	<10	<10	<10	<10	<10
Conkling Point	<29	<29	<10	<10	<10	<10	<10
Hidden Lake	<29	<29	<10	<10	<10	<10	<10
Chatcolet Lake Deep	<29	<29	<10	<10	<10	<10	<10
Benewah Lake	<29	<29	<10	<10	<10	-	-
St. Joe River	<29	<29	<10	<10	<10	<10	<10

-No samples taken to Spokane Tribal Lab.

Appendix B.9 Total kjeldahl nitrogen (µg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1998.

Location	Date 7/8/98	8/10/98	10/20/98
Rockford Bay	200	132	160
Windy Bay Shallow	<120	124	227
Windy Bay Deep	140	<120	212
Coeur d'Alene River	<120	232	157
Mid Lake Coeur d'Alene	<120	<120	<120
Carey Bay	240	<120	<120
Conkling Point	136	<120	<120
Hidden Lake	256	<120	<120
Round Lake	<120	120	<120
Chatcolet Lake Deep	172	<120	<120
Chatcolet Lake Shallow	228	<120	<120
Benewah Lake	<120	160	-
St. Joe River	<120	<120	<120

-No samples taken to Spokane Tribal Lab.

Appendix B.10 Total kjeldahl nitrogen (µg/L) results from the hypolimnion taken at eleven stations on Coeur d'Alene Lake, Idaho, 1998.

Location	Date 7/8/98	8/10/98	10/20/98
Rockford Bay	316	<120	156
Windy Bay Shallow	<120	124	<120
Windy Bay Deep	<120	188	157
Coeur d'Alene River	<120	132	124
Mid Lake Coeur d'Alene	<120	<120	489
Carey Bay	248	<120	<120
Conkling Point	148	<120	<120
Hidden Lake	312	<120	-
Chatcolet Lake Deep	232	120	<120
Benewah Lake	<120	136	-
St. Joe River	<120	<120	<120

-No samples taken to Spokane Tribal Lab.

Appendix B.11 Ortho-Phosphate (µg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1997.

Location	Date 10/20/97	11/4/97
Rockford Bay	<26	<26
Windy Bay Shallow	<26	<26
Windy Bay Deep	<26	<26
Coeur d'Alene River	<26	<26
Mid Lake Coeur d'Alene	<26	<26
Carey Bay	<26	<26
Conkling Point	<26	<26
Hidden Lake	<26	<26
Round Lake	<26	<26
Chatcolet Lake Deep	<26	<26
Chatcolet Lake Shallow	<26	<26
Benewah Lake	<26	-
St. Joe River	<26	<26

- No sample taken to Spokane Tribal Laboratory.

Appendix B.12 Ortho-Phosphate (µg/L) results from the hypolimnion taken at ten stations on Coeur d'Alene Lake, Idaho, 1997.

Location	Date 10/20/97	11/4/97
Rockford Bay	<26	<26
Windy Bay Shallow	<26	<26
Windy Bay Deep	<26	<26
Coeur d'Alene River	<26	<26
Mid Lake Coeur d'Alene	<26	<26
Carey Bay	<26	<26
Conkling Point	<26	<26
Hidden Lake	<26	<26
Chatcolet Lake Deep	<26	<26
St. Joe River	<26	<26

Appendix B.13 Ortho-phosphate (µg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1998.

Location	4/28/98	6/25/98	7/8/98	Date 8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	<26	<26	<20	<20	<20	<20	<20
Windy Bay Shallow	<26	<26	<20	<20	<20	<20	<20
Windy Bay Deep	<26	<26	<20	<20	<20	<20	<20
Coeur d'Alene River	<26	<26	<20	<20	<20	<20	<20
Mid Lake Coeur d'Alene	<26	<26	<20	<20	<20	<20	<20
Carey Bay	<26	<26	<20	<20	<20	<20	<20
Conkling Point	<26	<26	<20	<20	<20	<20	<20
Hidden Lake	<26	<26	<20	<20	<20	<20	<20
Round Lake	<26	<26	<20	<20	<20	<20	-
Chatcolet Lake Deep	<26	<26	<20	<20	<20	<20	<20
Chatcolet Lake Shallow	-	<26	<20	<20	<20	<20	-
Benewah Lake	<26	<26	<20	<20	<20	-	-
St. Joe River	<26	<26	<20	<20	<20	<20	<20

-No sample taken to Spokane Tribal Lab.

Appendix B.14 Ortho-phosphate (µg/L) results from the hypolimnion taken at eleven stations on Coeur d'Alene Lake, Idaho, 1998.

Location	4/28/98	6/26/98	7/8/98	Date 8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	<26	<26	<20	<20	<20	<20	<20
Windy Bay Shallow	<26	<26	<20	<20	<20	<20	<20
Windy Bay Deep	<26	<26	<20	<20	<20	<20	<20
Coeur d'Alene River	<26	<26	<20	<20	<20	<20	<20
Mid Lake Coeur d'Alene	<26	<26	<20	<20	<20	<20	<20
Carey Bay	<26	<26	<20	<20	<20	<20	<20
Conkling Point	<26	<26	<20	<20	<20	<20	<20
Hidden Lake	<26	<26	<20	<20	<20	<20	<20
Chatcolet Lake Deep	<26	<26	<20	<20	<20	<20	<20
Benewah Lake	<26	<26	<20	<20	<20	-	-
St. Joe River	<26	<26	<20	<20	<20	<20	<20

-No sample taken to Spokane Tribal Lab.

Appendix B.15 Total phosphorous (μg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1998.

Location	4/28/98	6/26/98	7/8/98	Date 8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	<5	<5	<5	<5	<5	<5	<5
Windy Bay Shallow	<5	<5	<5	<5	<5	<5	<5
Windy Bay Deep	<5	<5	<5	<5	<5	<5	<5
Coeur d'Alene River	<5	<5	<5	<5	<5	6	<5
Mid Lake Coeur d'Alene	<5	<5	<5	<5	<5	5	<5
Carey Bay	<5	<5	<5	<5	<5	<5	<5
Conkling Point	<5	<5	<5	<5	<5	<5	<5
Hidden Lake	<5	<5	<5	14	<5	<5	<5
Round Lake	<5	<5	<5	<5	<5	<5	-
Chatcolet Lake Deep	<5	<5	<5	<5	<5	<5	5
Chatcolet Lake Shallow	-	<5	<5	65	8	<5	-
Benewah Lake	8	6	<5	<5	<5	-	-
St. Joe River	<5	<5	<5	<5	<5	<5	<5

-No samples taken to Spokane Tribal Lab.

Appendix B.16 Total phosphorous (μg/L) results from the hypolimnion taken at eleven stations on Coeur d'Alene Lake, Idaho, 1998.

Location	4/28/98	6/26/98	7/8/98	Date 8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	<5	<5	<5	<5	<5	<5	<5
Windy Bay Shallow	<5	<5	<5	<5	<5	<5	<5
Windy Bay Deep	<5	<5	6	<5	<5	<5	<5
Coeur d'Alene River	<5	<5	<5	<5	<5	<5	<5
Mid Lake Coeur d'Alene	<5	<5	<5	<5	<5	<5	<5
Carey Bay	<5	<5	<5	<5	<5	<5	<5
Conkling Point	<5	<5	<5	<5	<5	<5	<5
Hidden Lake	<5	<5	16	25	9	-	<5
Chatcolet Lake Deep	<5	<5	<5	8	14	20	<5
Benewah Lake	8	26	8	13	<5	-	-
St. Joe River	<5	<5	<5	<5	<5	<5	<5

Appendix B.17 Chlorophyll$_a$ (µg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1997.

Location	Date 8/13/97	9/16/97	10/20/97	11/4/97[a]
Rockford Bay	<0.01	0.70	<0.01	3.30
Windy Bay Shallow	<0.01	<0.01	0.74	2.14
Windy Bay Deep	<0.01	1.34	2.23	1.38
Coeur d'Alene River	0.65	<0.01	-	2.96
Mid Lake Coeur d'Alene	1.42	0.64	1.90	2.91
Carey Bay	0.64	<0.01	-	1.28
Conkling Point	<0.01	2.16	1.38	3.39
Hidden Lake	<0.01	Contaminated	3.62	6.89
Round Lake	<0.01	1.54	0.67	0.64
Chatcolet Lake Deep	3.14	2.81	4.26	7.66
Chatcolet Lake Shallow	5.32	4.89	2.78	0.69
Benewah Lake	0.64	25.79	3.54	-
St. Joe River	-	Contaminated	1.40	<0.01

- No sample taken to Spokane Tribal Laboratory.

[a] Coeur d'Alene Lake was isothermal.

Appendix B.18 Chlorophyll$_a$ (µg/L) results from the hypolimnion taken at eleven stations on Coeur d'Alene Lake, Idaho, 1997.

Location	Date 8/13/97	9/16/97	10/20/97	11/4/97[a]
Rockford Bay	1.40	2.09	-	-
Windy Bay Shallow	2.14	0.68	-	-
Windy Bay Deep	0.64	0.64	<0.01	-
Coeur d'Alene River	0.69	1.32	<0.01	-
Mid Lake Coeur d'Alene	0.69	2.07	1.38	-
Carey Bay	<0.01	1.33	1.4	-
Conkling Point	0.005	1.37	<0.01	-
Hidden Lake	11.92	20.25	1.98	-
Chatcolet Lake Deep	6.03	Contaminated	14.04	-
Benewah Lake	34.14	28.78	-	-
St. Joe River	-	0.70	<0.01	-

- No sample taken to Spokane Tribal Laboratory.

[a] Coeur d'Alene Lake was isothermal.

Appendix B.19 Chlorophyll$_a$ (μg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1998.

Location	4/28/98	6/26/98	7/8/98	Date 8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	1.240	1.49	<0.01	<0.01	1.31	1.89	0.71
Windy Bay Shallow	2.080	2.11	<0.01	0.71	0.066	<0.01	1.85
Windy Bay Deep	1.290	0.7	2.85	2.01	2.25	<0.01	1.24
Coeur d'Alene River	1.310	1.22	0.73	<0.01	<0.01	<0.01	2.46
Mid Lake Coeur d'Alene	1.890	2.22	0.69	<0.01	1.43	0.7	0.66
Carey Bay	1.920	3.14	1.79	2	2.09	0.69	1.26
Conkling Point	<0.01	1.4	2.58	<0.01	2.78	0.63	2.63
Hidden Lake	<0.01	1.88	3.57	30.84	1.38	6.04	2.87
Round Lake	<0.01	<0.01	1.29	0.67	3.49	3.25	-
Chatcolet Lake Deep	<0.01	2.55	4.69	4.09	3.42	0.69	7.21
Chatcolet Lake Shallow	-	0.75	8.96	2.61	2.77	8.38	-
Benewah Lake	1.470	4.05	23.6	61.41	0.65	-	-
St. Joe River	0.640	1.47	0.67	<0.01	2.68	3.91	1.38

-No samples taken to Spokane Tribal Laboratory.

Appendix B.20 Chlorophyll$_a$ (μg/L) results from the hypolimnion taken at eleven stations on Coeur d'Alene Lake, Idaho, 1998.

Location	4/28/98	6/26/98	7/8/98	Date 8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	1.930	0.7	2.1	4.09	1.41	2.17	0.65
Windy Bay Shallow	3.440	<0.01	1.44	2.07	0.71	<0.01	<0.01
Windy Bay Deep	1.250	2.96	0.67	<0.01	2.86	<0.01	0.66
Coeur d'Alene River	<0.01	<0.01	1.99	0.65	2.67	1.42	2.84
Mid Lake Coeur d'Alene	0.590	0.7	<0.01	0.62	2.02	<0.01	<0.01
Carey Bay	1.260	<0.01	0.72	2.08	2.65	1.97	1.26
Conkling Point	<0.01	<0.01	0.7	0.68	2.24	3.43	2.75
Hidden Lake	5.490	6.16	16.84	80.92	18.72	-	5.22
Chatcolet Lake Deep	2.030	<0.01	3.31	4.42	3.06	8.47	6.76
Benewah Lake	2.05	9.18	15.26	54.46	15.95	-	-
St. Joe River	<0.01	1.27	0.74	4.69	<0.01	5.83	0.63

-No samples taken to Spokane Tribal Laboratory.

Appendix B.21 Total suspended solids (mg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho 1997.

	Date			
Location	8/13/97	9/16/97	10/20/97	11/4/97
Rockford Bay	<2	2	<0.5	<0.5
Windy Bay Shallow	<2	2	<0.5	<0.5
Windy Bay Deep	<2	2	<0.5	<0.5
Coeur d'Alene River	2	2	<0.5	<0.5
Mid Lake Coeur d'Alene	<2	2	<0.5	1.5
Carey Bay	<2	2	<0.5	4.0
Conkling Point	<2	2	<0.5	6.5
Hidden Lake	10	97	2.5	<0.5
Round Lake	<2	2	1.5	16.0
Chatcolet Lake Deep	<2	2	2.0	<0.5
Chatcolet Lake Shallow	10	16	6.5	4.0
Benewah Lake	10	3	8.0	-
St. Joe River	-	2	5.0	3.0

- No sample taken to Spokane Tribal Laboratory.

Appendix B.22 Total suspended solids (mg/L) results from the hypolimnion taken at eleven stations on Coeur d'Alene Lake, Idaho, 1997.

	Date			
Location	8/13/97	9/16/97	10/20/97	11/4/97
Rockford Bay	<2	2.0	<0.5	<0.5
Windy Bay Shallow	<2	2.0	<0.5	<0.5
Windy Bay Deep	2	2.0	<0.5	29.0
Coeur d'Alene River	3	2.0	<0.5	1.5
Mid Lake Coeur d'Alene	<2	2.0	1.0	3.0
Carey Bay	210	2.0	2.5	4.0
Conkling Point	<2	2.0	<0.5	7.5
Hidden Lake	10	2.000	3.000 3.0	<0.5
Chatcolet Lake Deep	20	5.0	12.5	<0.5
Benewah Lake	20	7	-	-
St. Joe River	-	2.0	4.5	<0.5

- No sample taken to Spokane Tribal Laboratory.

Appendix B. 23 Total suspended solids (mg/L) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1998.

	Date						
Location	4/28/98	6/26/98	7/8/98	8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	<2	2	3	<2	<2	<2	<2
Windy Bay Shallow	<2	3	2	2	<2	<2	<2
Windy Bay Deep	5.5	2	3	3	<2	<2	<2
Coeur d'Alene River	3	3	2	<2	<2	<2	<2
Mid Lake Coeur d'Alene	3	<2	2	<2	<2	<2	2.5
Carey Bay	4	<2	2	10	<2	2	<2
Conkling Point	3	<2	3	2	<2	<2	<2
Hidden Lake	3	<2	4	7.5	<2	6.5	3.5
Round Lake	4.5	4	<2	<2	2.5	9	-
Chatcolet Lake Deep	<2	2	2	<2	<2	5.5	6.75
Chatcolet Lake Shallow	-	3	<2	<2	<2	10.500	-
Benewah Lake	4	4	8	4.5	<2	-	-
St. Joe River	3	2	2	2.5	<2	2.5	3.75

-No samples taken to Spokane Tribal Lab.

Appendix B.24 Total suspended solids (mg/L) results from the hypolimnion taken at eleven stations on Coeur d'Alene Lake, Idaho, 1998.

	Date						
Location	4/28/98	6/26/98	7/8/98	8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	10	4	3	4.5	2	<2	<2
Windy Bay Shallow	<2	3	<2	12	3	2.5	<2
Windy Bay Deep	27	<2	3	2.5	<2	<2	<2
Coeur d'Alene River	8	3	4	2	2.5	7.75	3.75
Mid Lake Coeur d'Alene	<2	<2	14	<2	<2	4.25	3.25
Carey Bay	<2	<2	4	10	11	5.5	<2
Conkling Point	<2	<2	3	<2	2	4.5	4.5
Hidden Lake	47	4	9	11	14.5	-	3.25
Chatcolet Lake Deep	28.5	141	4	3	3	3	7
Benewah Lake	4.5	16	7	<2	3.5	-	-
St. Joe River	3.5	2	9	3	<2	2.5	3

-No samples taken to Spokane Tribal Lab.

Appendix B.25 Turbidity (NTU) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1997.

	Date			
Location	8/13/97	9/16/97	10/20/97	11/4/97
Rockford Bay	0.35	0.30	0.27	0.24
Windy Bay Shallow	0.63	0.33	0.27	0.25
Windy Bay Deep	0.28	0.4	0.23	0.27
Coeur d'Alene River	0.87	0.51	0.51	0.43
Mid Lake Coeur d'Alene	0.33	1.99	0.84	0.38
Carey Bay	0.56	0.84	0.88	0.49
Conkling Point	0.54	0.96	0.76	0.86
Hidden Lake	4.76	1.56	0.96	1.42
Round Lake	3.820	0.45	1.88	0.93
Chatcolet Lake Deep	1.01	1.39	1.08	1.61
Chatcolet Lake Shallow	3.69	0.77	2.01	11.20
Benewah Lake	5.81	1.55	1.60	-
St. Joe River	-	0.62	1.87	7.86

- No sample taken to Spokane Tribal Laboratory.

Appendix B.26 Turbidity (NTU) results from the hypolimnion taken at eleven stations on Coeur d'Alene Lake, Idaho, 1997.

	Date			
Location	8/13/97	9/16/97	10/20/97	11/4/97
Rockford Bay	0.6	0.37	0.24	0.27
Windy Bay Shallow	0.92	0.42	0.28	0.85
Windy Bay Deep	0.86	0.87	0.67	0.74
Coeur d'Alene River	1.02	0.51	0.85	0.88
Mid Lake Coeur d'Alene	1.3	0.82	1.13	0.76
Carey Bay	1.32	1.34	2.23	0.70
Conkling Point	1.87	2.00	0.92	1.01
Hidden Lake	1.31	3.60	1.06	1.39
Chatcolet Lake Deep	3.52	1.90	2.63	3.68
Benewah Lake	0.81	2.01	-	-
St. Joe River	-	0.76	1.83	7.68

- No sample taken to Spokane Tribal Laboratory.

Appendix B.27 Turbidity (NTU) results from the epilimnion taken at thirteen stations on Coeur d'Alene Lake, Idaho, 1998.

Location	4/28/98	6/26/98	7/8/98	Date 8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	0.790	1.65	0.507	1.06	0.668	0.811	0.404
Windy Bay Shallow	1.700	2.61	0.492	0.505	0.956	0.832	0.536
Windy Bay Deep	1.560	0.89	0.667	0.316	0.592	0.68	0.403
Coeur d'Alene River	1.920	1.48	1.26	1.06	0.563	0.752	0.775
Mid Lake Coeur d'Alene	1.690	0.782	0.935	0.441	2.3	0.89	0.902
Carey Bay	1.800	1.06	0.577	0.44	1.21	1.03	1.33
Conkling Point	1.720	1.09	1.19	0.464	0.862	0.946	1.12
Hidden Lake	2.630	1.1	1.96	5.53	0.85	2.76	2.02
Round Lake	1.700	2.31	0.915	1.24	1.53	2	-
Chatcolet Lake Deep	2.430	1.98	1.74	1.73	1.33	2.88	0.963
Chatcolet Lake Shallow	-	1.7	2.08	2.3	2.1	4.28	-
Benewah Lake	6.84	2.41	4.39	3.37	1.72	-	-
St. Joe River	1.34	1.82	0.865	1.18	1.57	2.57	2.21

-No samples taken to Spokane Tribal Lab.

Appendix B.28 Turbidity (NTU) results from the hypolimnion taken at eleven stations on Coeur d'Alene Lake, Idaho, 1998.

Location	4/28/98	6/26/98	7/8/98	Date 8/10/98	9/2/98	10/20/98	11/12/98
Rockford Bay	1.890	3.61	2.24	1.73	1.19	0.806	0.465
Windy Bay Shallow	1.130	3.8	4.72	6.72	1.24	1.06	0.597
Windy Bay Deep	12.000	1.53	1.26	0.54	1.07	0.752	0.335
Coeur d'Alene River	2.680	2.85	2.16	1.31	1.65	4.21	1.74
Mid Lake Coeur d'Alene	1.340	2.88	0.947	0.89	1.98	3.2	1.42
Carey Bay	2.090	1.6	2.06	0.722	5.06	2.27	1.21
Conkling Point	1.700	1.93	1.38	1	1.76	3.48	2.23
Hidden Lake	6.200	4.45	4.56	9.7	18.5	-	1.69
Chatcolet Lake Deep	9.700	43.1	1.78	1.75	4.06	0.886	2.95
Benewah Lake	8.23	12.4	9.35	4.02	3.19	-	-
St. Joe River	1.920	1.96	1.1	1.9	1.6	2.19	2.01

-No samples taken to Spokane Tribal Lab.

Appendix B.29 Results from trace metal analysis (mg/L). Water samples taken from the epilimnion at three sites on Coeur d'Alene Lake, Idaho, 1997.

Metals	Location	Date 10/20/97	11/4/97
As	Site 1[a]	<0.050	<0.050
	Site 2[b]	<0.050	<0.050
	Site 3[c]	<0.050	<0.050
Ca	Site 1[a]	5.92	5.81
	Site 2[b]	6.70	6.94
	Site 3[c]	6.73	6.94
Cd	Site 1[a]	<0.010	<0.010
	Site 2[b]	<0.010	<0.010
	Site 3[c]	<0.010	<0.010
Fe	Site 1[a]	0.054	<0.020
	Site 2[b]	0.043	0.108
	Site 3[c]	0.065	0.102
K	Site 1[a]	0.888	<0.850
	Site 2[b]	<0.850	<0.850
	Site 3[c]	1.21	1.16
Mg	Site 1[a]	1.690	1.67
	Site 2[b]	1.950	1.91
	Site 3[c]	1.85	1.87
Mn	Site 1[a]	<0.005	<0.005
	Site 2[b]	0.018	0.022
	Site 3[c]	0.007	0.022
Na	Site 1[a]	1.51	1.48
	Site 2[b]	1.61	1.59
	Site 3[c]	1.58	1.68
Pb	Site 1[a]	<0.001	<0.001
	Site 2[b]	0.004	0.005
	Site 3[c]	0.002	0.003
Si	Site 1[a]	5.120	5.24
	Site 2[b]	5.070	4.46
	Site 3[c]	4.52	4.69
Zn	Site 1[a]	0.094	0.101
	Site 2[b]	0.132	0.105
	Site 3[c]	0.097	0.090

[a] Station Windy Bay Deep.
[b] Station Coeur d'Alene River.
[c] Station Mid Lake Coeur d'Alene.

Appendix B.30 Results from trace metal analysis (mg/L). Water samples taken from the hypolimnion at three sites on Coeur d'Alene Lake, Idaho, 1997.

		Date	
Metals	Location	10/20/97	11/4/97
As	Site 1[a]	<0.050	<0.050
	Site 2[b]	<0.050	<0.050
	Site 3[c]	<0.050	<0.050
Ca	Site 1[a]	5.48	6.07
	Site 2[b]	7.38	6.92
	Site 3[c]	6.95	5.59
Cd	Site 1[a]	<0.010	<0.010
	Site 2[b]	<0.010	<0.010
	Site 3[c]	<0.010	<0.010
Fe	Site 1[a]	0.066	0.681
	Site 2[b]	0.134	0.145
	Site 3[c]	0.108	0.140
K	Site 1[a]	<0.850	<0.850
	Site 2[b]	<0.850	<0.850
	Site 3[c]	<0.850	<0.850
Mg	Site 1[a]	1.660	1.81
	Site 2[b]	2.320	2.34
	Site 3[c]	1.86	1.67
Mn	Site 1[a]	0.013	0.183
	Site 2[b]	0.050	0.058
	Site 3[c]	0.019	0.037
Na	Site 1[a]	1.72	1.64
	Site 2[b]	1.78	1.53
	Site 3[c]	1.65	1.67
Pb	Site 1[a]	0.003	0.032
	Site 2[b]	0.013	0.016
	Site 3[c]	<0.001	0.004
Si	Site 1[a]	6.740	5.97
	Site 2[b]	4.710	4.68
	Site 3[c]	4.78	6.42
Zn	Site 1[a]	0.133	0.159
	Site 2[b]	0.185	0.226
	Site 3[c]	0.078	0.124

[a] Station Windy Bay Deep.
[b] Station Coeur d'Alene River.
[c] Station Mid Lake Coeur d'Alene.

Appendix B.31Results from trace metal analysis. Water samples taken from the epilimnion at three sites on Co

Metals	Location	4/28/98	6/26/98	7/8/98	Date 8/10/98	9/2/98	10/20/98	11/12/98
As	Site 1[a]	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Site 2[b]	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Site 3[c]	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Ca	Site 1[a]	6.007	5.955	5.768	6.306	6.176	6.609	6.231
	Site 2[b]	4.923	6.16	6.48	7.58	6.317	7.722	7
	Site 3[c]	5.623	5.638	5.842	6.844	6.532	7.473	6.591
Cd	Site 1[a]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Site 2[b]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0059
	Site 3[c]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fe	Site 1[a]	0.130	0.013	0.1291	0.0177	0.0376	0.0252	0.0214
	Site 2[b]	0.175	<0.010	0.1048	0.0984	0.0379	0.0912	0.074
	Site 3[c]	0.162	0.0104	0.0664	0.0399	0.0707	0.0558	0.0783
K	Site 1[a]	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900
	Site 2[b]	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	1.023
	Site 3[c]	<0.900	<0.900	<0.900	<0.900	<0.900	1.535	<0.900
Mg	Site 1[a]	1.869	1.54	1.643	1.768	1.757	1.956	1.765
	Site 2[b]	1.688	1.448	1.803	2.178	1.776	2.306	1.92
	Site 3[c]	1.431	1.459	1.532	1.804	1.768	2.092	1.734
Mn	Site 1[a]	0.017	<0.003	0.0371	0.0044	0.0071	0.0072	0.0083
	Site 2[b]	0.053	<0.003	0.0274	0.0355	0.0089	0.0273	0.0298
	Site 3[c]	0.017	<0.003	0.0125	0.0073	0.0134	0.0054	0.035
Na	Site 1[a]	1.848	1.355	1.469	1.58	1.559	1.597	1.586
	Site 2[b]	1.256	1.315	1.495	1.717	1.588	1.783	1.819
	Site 3[c]	1.458	1.348	1.413	1.641	1.605	1.886	1.505
Pb	Site 1[a]	0.005	0.002	0.007	<0.001	<0.001	0.002	<0.001
	Site 2[b]	0.021	0.002	0.007	0.011	0.002	0.007	0.002
	Site 3[c]	0.002	<0.001	0.002	<0.001	0.004	0.003	0.002
Si	Site 1[a]	5.323	4.246	4.17	3.956	3.816	3.659	3.43
	Site 2[b]	4.646	4.458	4.154	3.927	3.492	3.392	3.27
	Site 3[c]	5.423	4.193	4.066	4.1	3.681	3.311	3.029
Zn	Site 1[a]	0.114	0.0706	0.0847	0.0668	0.0537	0.0782	0.0702
	Site 2[b]	0.140	0.0393	0.0728	0.0914	0.0498	0.124	0.0693
	Site 3[c]	0.037	0.055	0.0532	0.0583	0.0546	0.0664	0.0611

[a] Station Windy Bay Deep.
[b] Station Coeur d’Alene River.
[c] Station Mid Lake Coeur d’Alene.

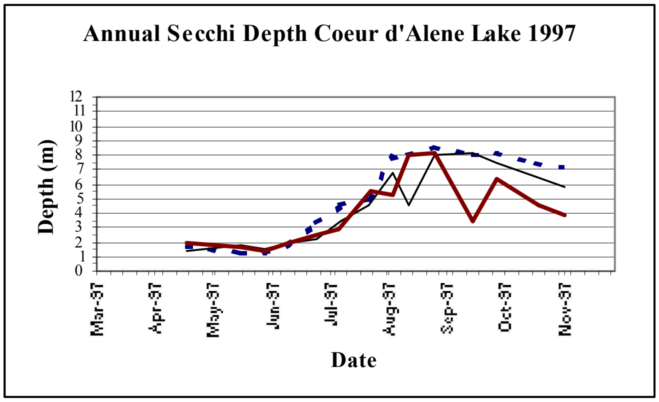
Appendix B.32 Results from trace metal analysis. Water samples taken from the hypolimnion at three sites on Coeur d'Alene Lake, Idaho, 1998.

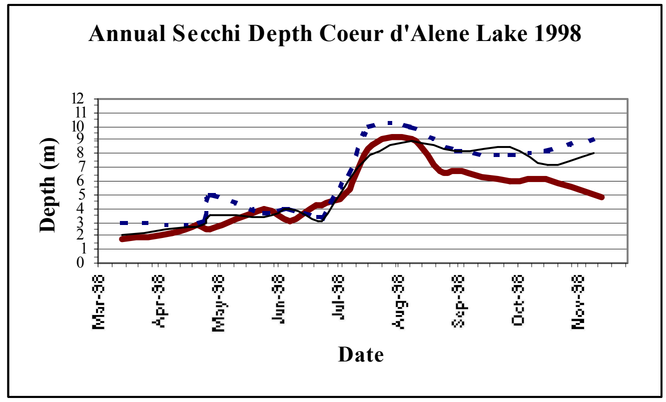
Metals	Location	Date 4/28/98	6/26/98	7/8/98	8/10/98	9/2/98	10/20/98	11/12/98
As	Site 1[a]	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Site 2[b]	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Site 3[c]	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Ca	Site 1[a]	5.909	5.744	5.66	5.909	5.576	6.105	6.21
	Site 2[b]	5.062	5.984	5.594	5.727	6.888	8.355	7.218
	Site 3[c]	6.085	5.691	5.313	6.339	5.539	6.068	6.485
Cd	Site 1[a]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Site 2[b]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Site 3[c]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0078
Fe	Site 1[a]	0.126	0.0152	0.0737	0.0839	0.1562	0.0273	0.0205
	Site 2[b]	0.369	0.0152	0.1564	0.0882	0.1475	0.453	0.0645
	Site 3[c]	0.115	0.0133	0.2067	0.0502	0.0536	0.2738	0.0825
K	Site 1[a]	<0.900	0.908	<0.900	<0.900	<0.900	1.025	<0.900
	Site 2[b]	<0.900	<0.900	<0.900	<0.900	<0.900	1.407	<0.900
	Site 3[c]	<0.900	<0.900	<0.900	<0.900	<0.900	1.03	<0.900
Mg	Site 1[a]	1.866	1.58	1.713	1.715	1.667	1.845	1.758
	Site 2[b]	1.744	1.441	1.607	1.62	1.906	2.651	1.978
	Site 3[c]	1.895	1.527	1.51	1.72	1.551	1.816	1.865
Mn	Site 1[a]	0.033	<0.003	0.0081	0.0274	0.0526	0.0126	0.0136
	Site 2[b]	0.080	<0.003	0.0395	0.0371	0.0294	0.0992	0.0309
	Site 3[c]	0.012	<0.003	0.0419	0.0564	0.0406	0.2789	0.0768
Na	Site 1[a]	1.728	1.536	1.671	1.66	1.645	1.623	1.634
	Site 2[b]	1.290	1.389	1.421	1.502	1.638	2.093	1.666
	Site 3[c]	1.730	1.537	1.492	1.626	1.521	1.683	1.724
Pb	Site 1[a]	0.005	0.002	0.001	0.005	0.003	0.002	<0.001
	Site 2[b]	0.058	0.007	0.015	0.013	0.013	0.063	0.002
	Site 3[c]	0.005	<0.001	0.001	0.002	0.004	0.006	0.003
Si	Site 1[a]	5.225	4.687	4.759	4.476	4.605	4.522	4.044
	Site 2[b]	4.663	4.616	4.092	3.773	3.765	3.467	3.347
	Site 3[c]	5.223	4.703	4.659	4.456	4.367	5.317	4.217
Zn	Site 1[a]	0.131	0.1011	0.1077	0.1213	0.1261	0.1077	0.0965
	Site 2[b]	0.159	0.0585	0.0873	0.0881	0.0681	0.2367	0.0734
	Site 3[c]	0.122	0.0748	0.0788	0.0949	0.0962	0.1147	0.1096

[a] Station Windy Bay Deep.
[b] Station Coeur d'Alene River.
[c] Station Mid Lake Coeur d'Alene.

Appendix C

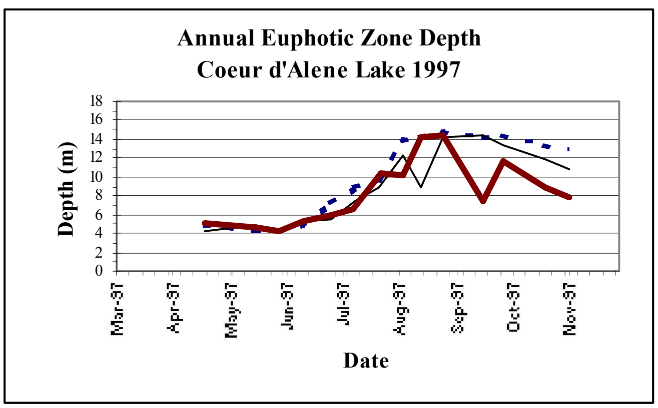
Secchi readings and empirically derived estimates of euphotic zone depth for thirteen stations in Coeur d'Alene Lake, 1997 and 1998.

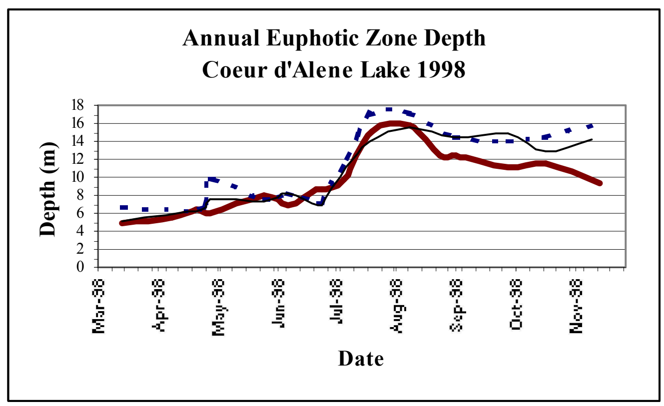




Rockford Bay - - - - - - - Carey Bay ━━━━━ Windy Bay Shallow ─────

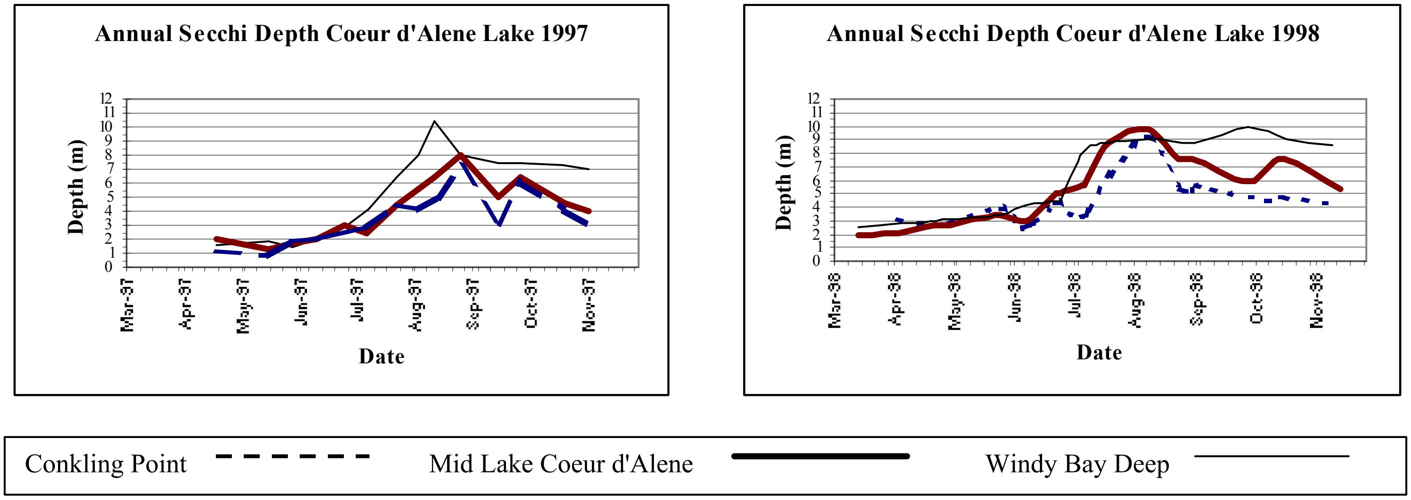
Appendix C.1 Annual secchi readings (SD) for three geomorphology similar sampling locations on Coeur d'Alene Lake during 1997 and 1998.



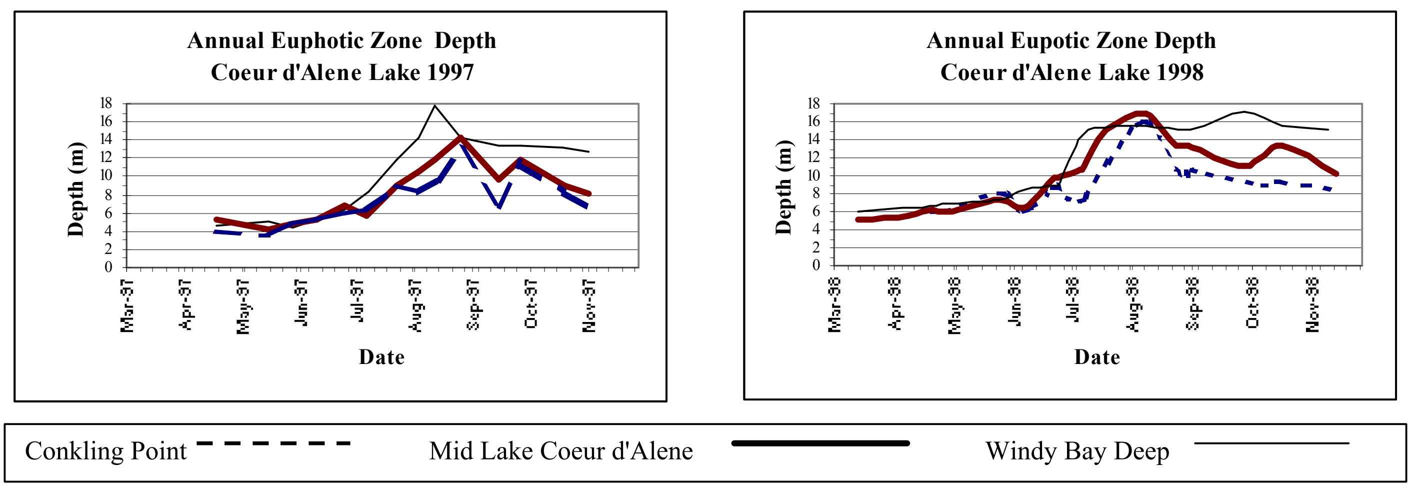


Rockford Bay - - - - - - - Carey Bay ━━━━━ Windy Bay Shallow ─────

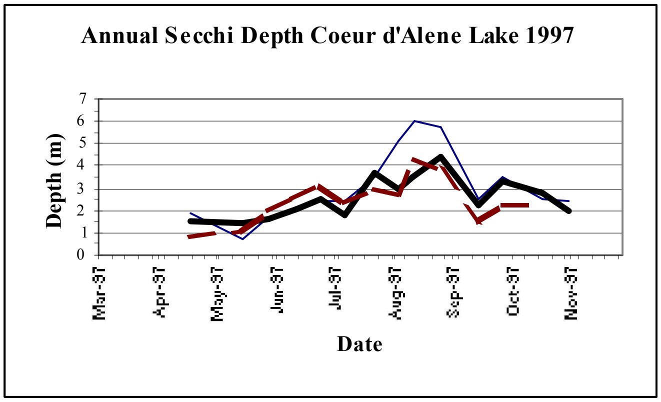
Appendix C.2 Empirically derived estimate of euphotic zone depth (EZD) during 1997 and 1998. Values are calculated using the following regression equation published by Alaska Department of Fish and Game (1987): EZD=2.2303 + 1.4914SD (r^2 = .78).

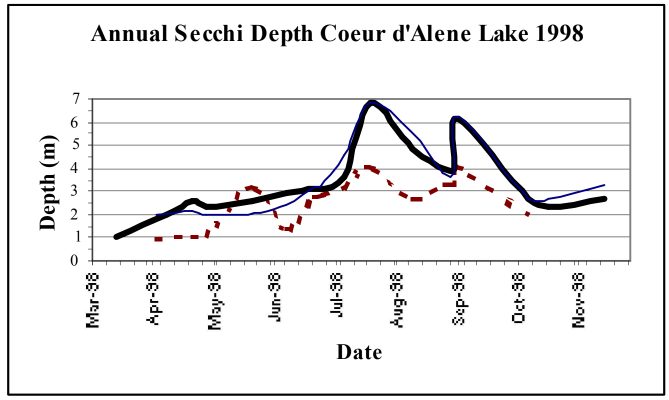


Appendix C.3 Annual secchi readings (SD) for three geomorphology similar sampling locations on Coeur d'Alene Lake during 1997 and 1998.



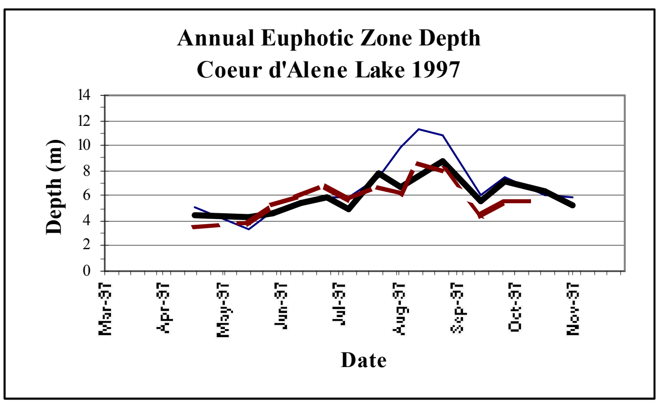
Appendix C.4 Empirically derived estimate of euphotic zone depth (EZD) during 1997 and 1998. Values are calculated using the following regression equation published by Alaska Department of Fish and Game (1987): EZD=2.2303 + 1.4914SD (r^2 = .78).

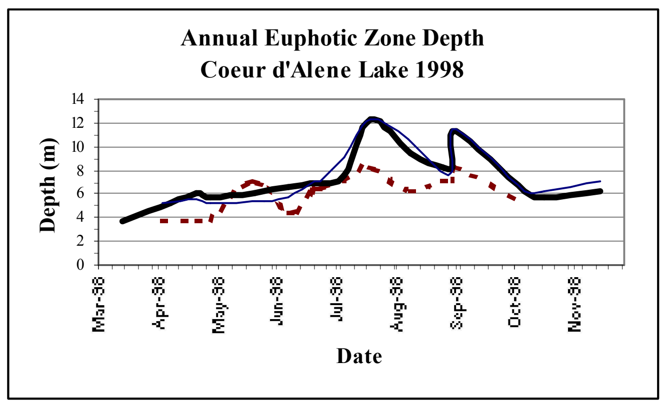




Benewah Lake - - - - - - Chatcolet Lake Deep ——— Hidden Lake ———

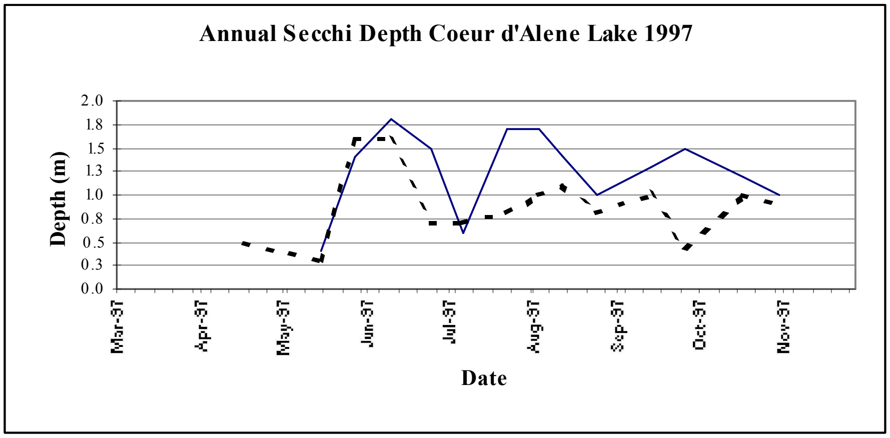
Appendix C.5 Annual secchi readings (SD) for three geomorphology similar sampling locations on Coeur d'Alene Lake during 1997 and 1998.

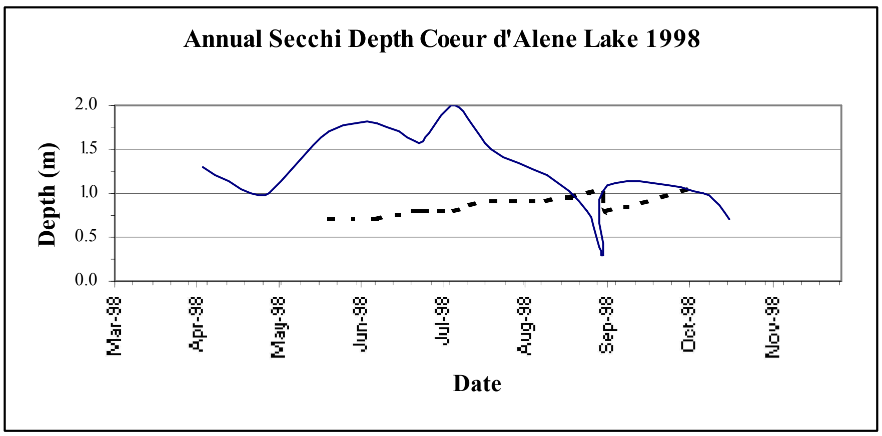




Benewah Lake - - - - - Chatcolet Lake Deep ——— Hidden Lake ———

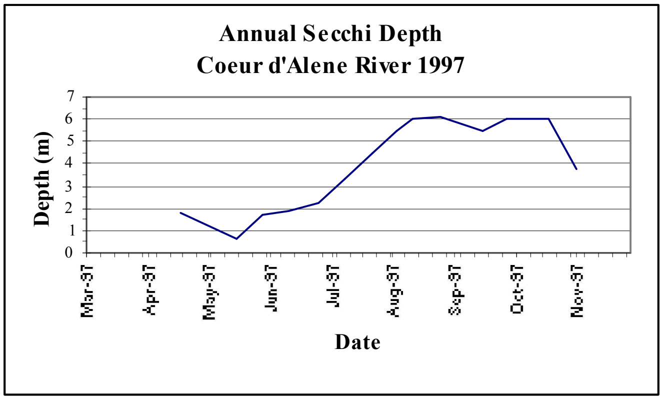
Appendix C.6 Empirically derived estimate of euphotic zone depth (EZD) during 1997 and 1998. Values are calculated using the following regression equation published by Alaska Department of Fish and Game (1987): $EZD=2.2303 + 1.4914SD$ ($r^2 = .78$).

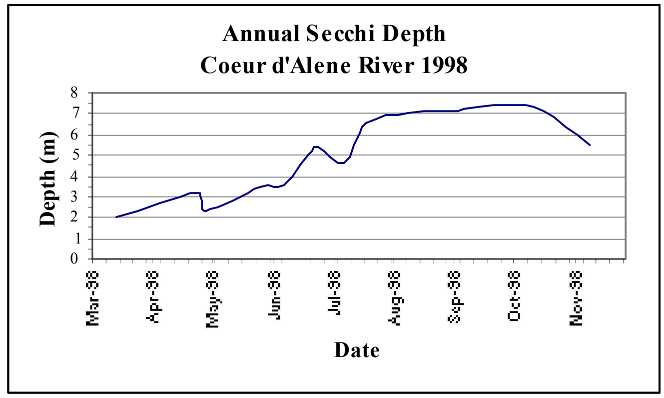




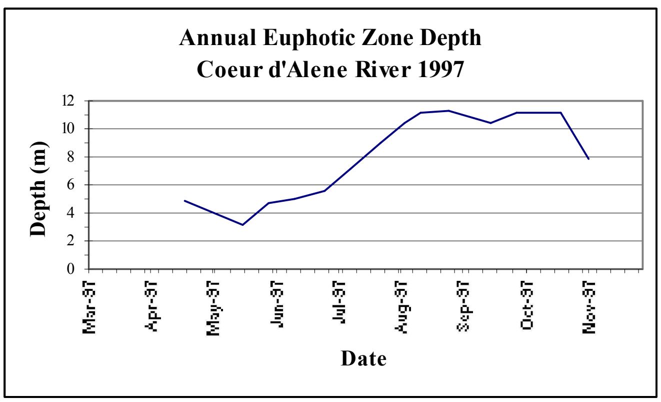
Chatcolet Lake Shallow - - - - Round Lake ———

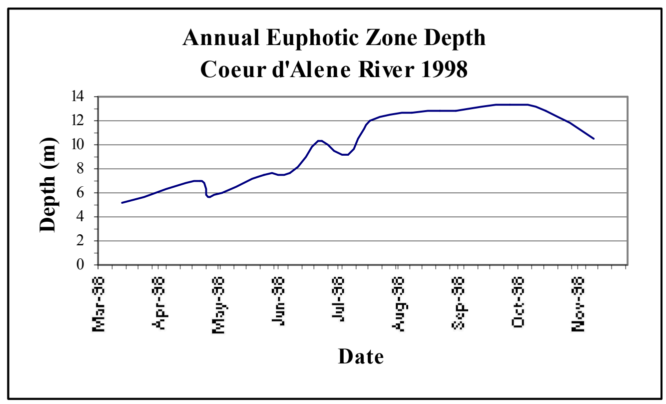
Appendix C.7 Annual secchi readings (SD) for two geomorphically similar sampling locations on Coeur d'Alene Lake during 1997 and 1998. Due to the shallowness of these lakes, the euphotic zone depth encompasses the entire water column.



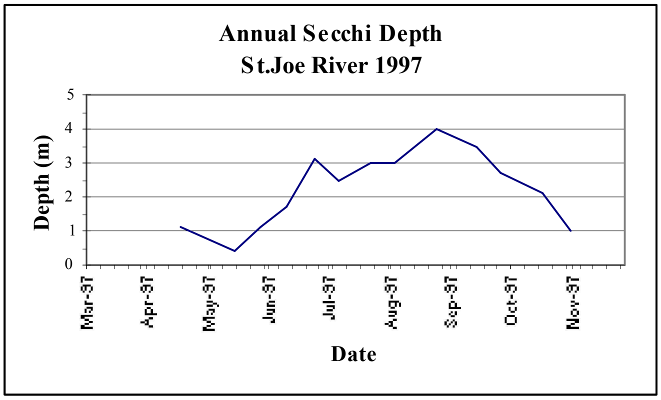


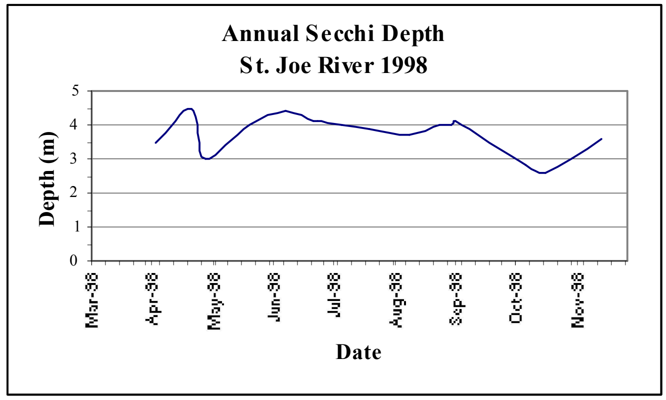
Appendix C.8 Annual secchi readings (SD) for the mouth of the Coeur d'Alene River during 1997 and 1998.



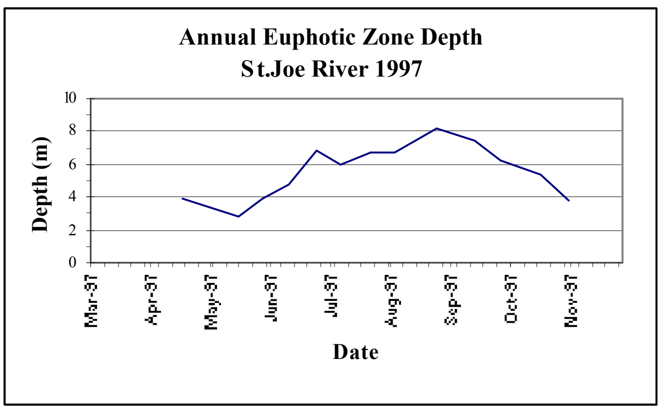


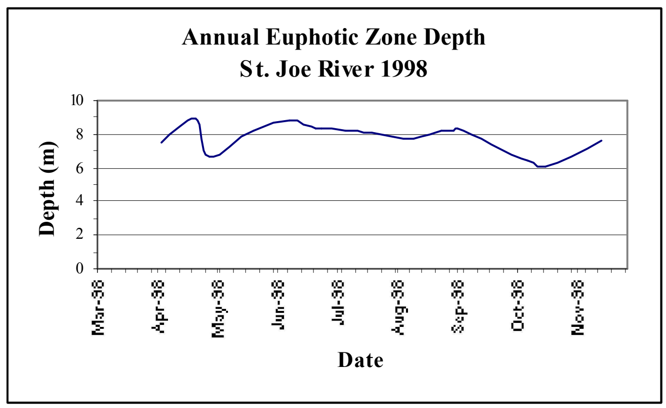
Appendix C.9 Empirically derived estimate of euphotic zone depth (EZD). Values are calculated using the following regression equation published by Alaska Department of Fish and Game (1987): EZD=2.2303 + 1.4914SD (r^2 = .78).





Appendix C.10 Annual secchi readings (SD) for the mouth of the St. Joe River during 1997 and 1998.

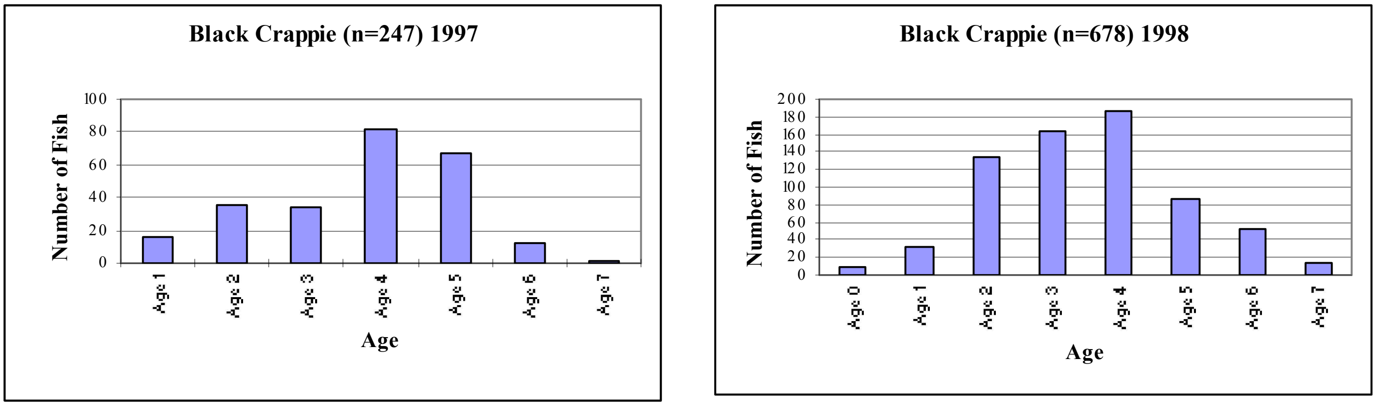




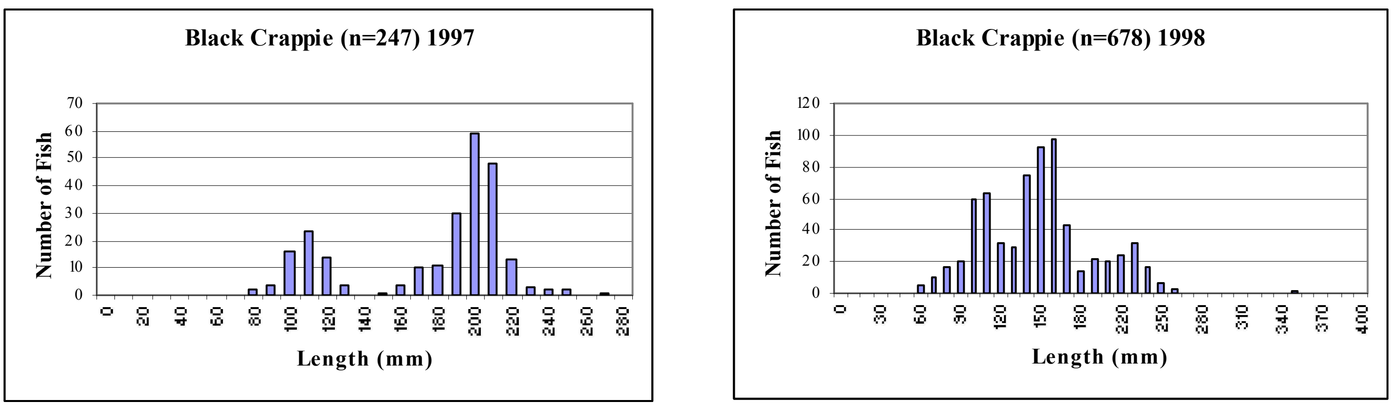
Appendix C.11 Empirically derived estimate of euphotic zone depth (EZD). Values are calculated using the following regression equation published by Alaska Department of Fish and Game (1987): EZD=2.2303 + 1.4914SD (r^2 = .78).

Appendix D

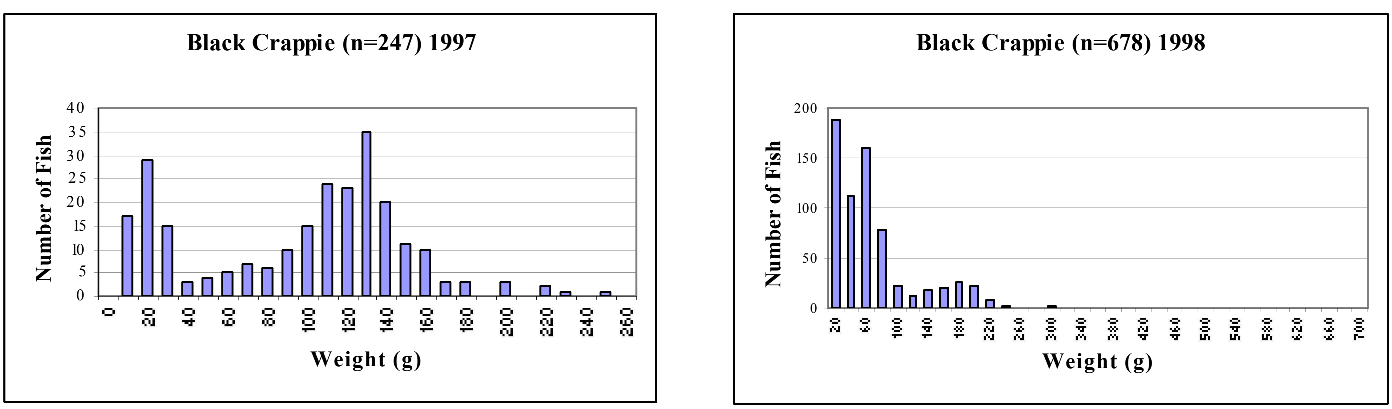
Age distribution, length and weight frequencies and length and weight regression graphs for aged fish species sampled in Coeur d'Alene Lake, 1997 and 1998.



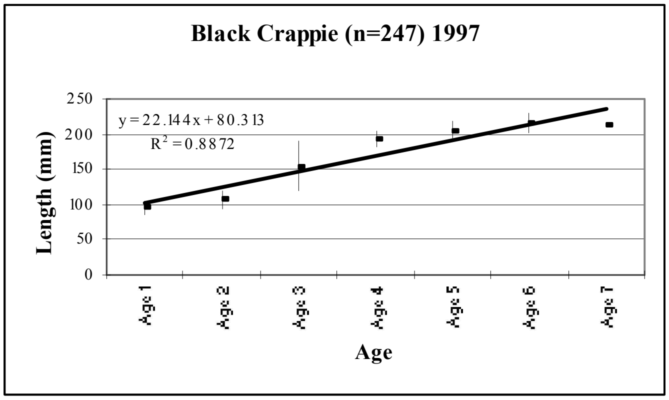
Appendix D.1 Age distribution of the number of Black Crappie versus age, in 1997 and 1998.

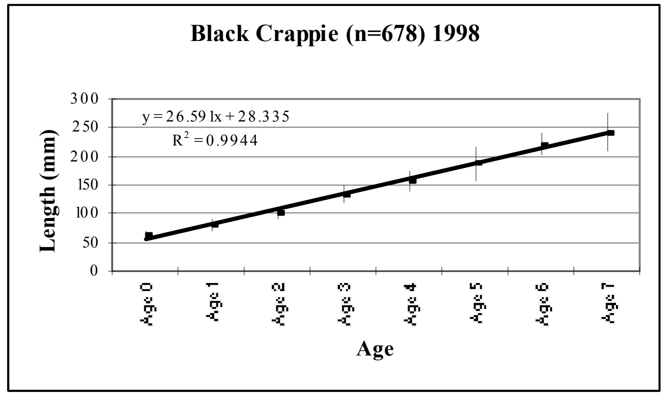


Appendix D.2 Frequency distribution of the number of Black Crappie sampled versus body length in 1997 and 1998.

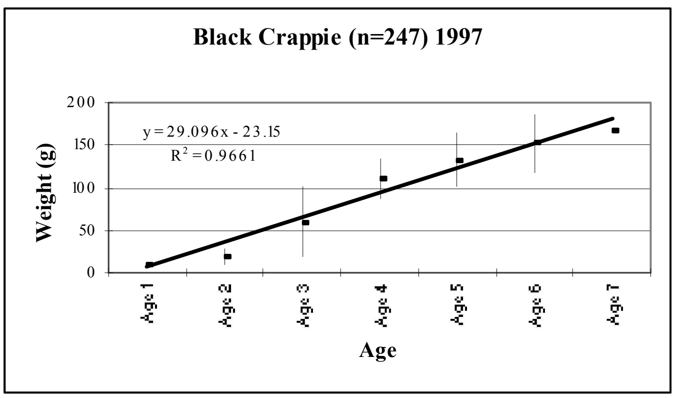


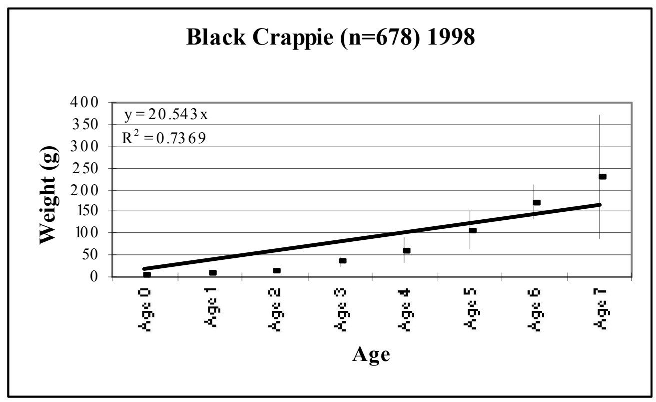
Appendix D.3 Frequency distribution of the number of Black Crappie sampled versus weight in 1997 and 1998.



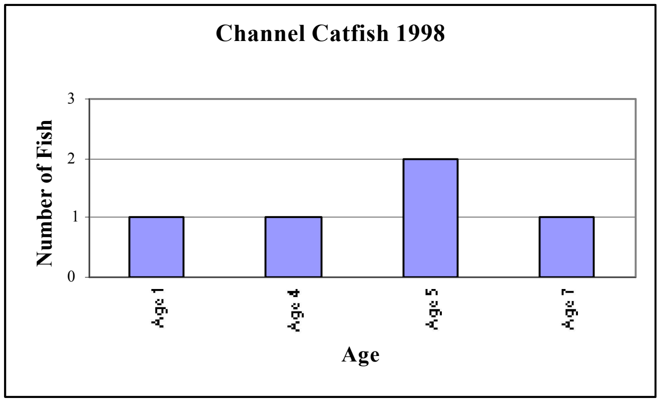


Appendix D.4 Regression equations of body length versus age for Black Crappie, in 1997 and 1998.

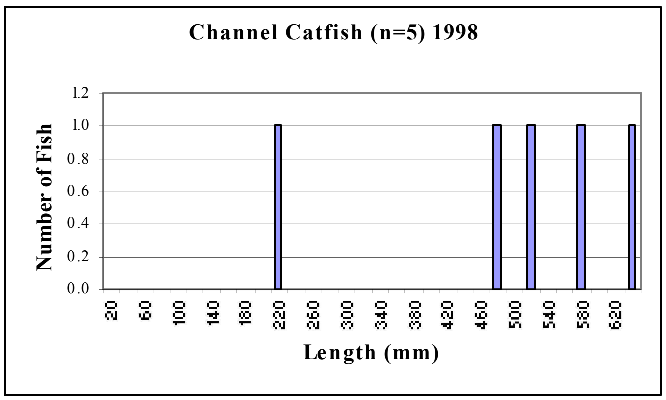


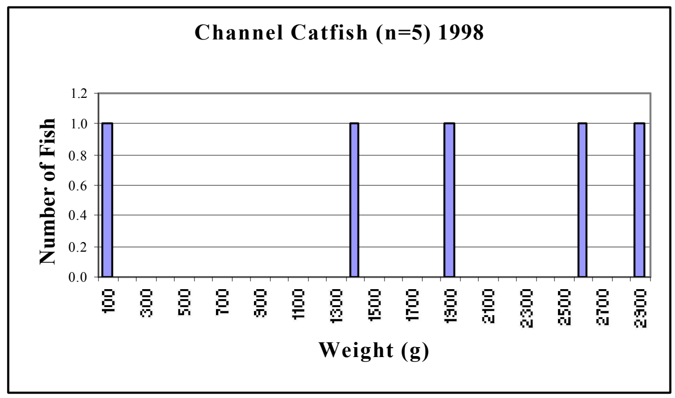


Appendix D.5 Regression equations of weight versus age for Black Crappie, in 1997 and 1998.

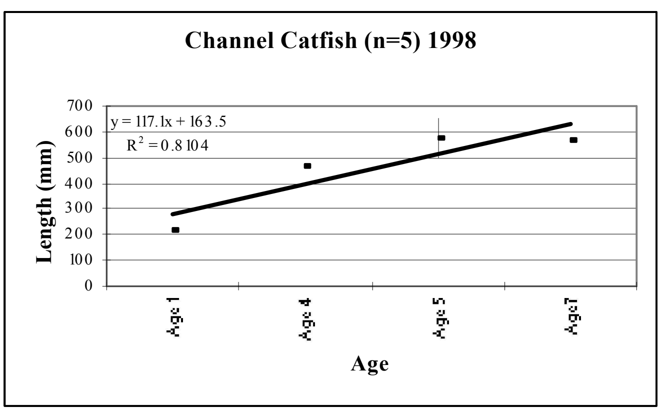


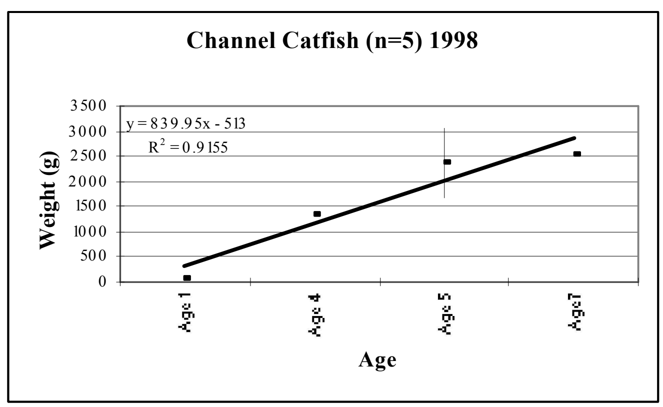
Appendix D.6 Age distribution of the number of Channel Catfish sampled versus age in 1998.



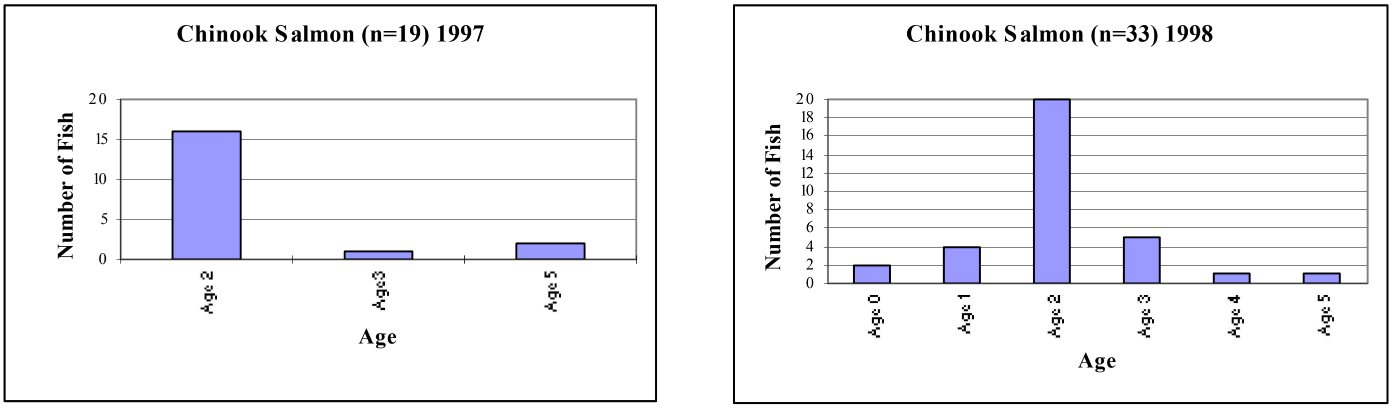


Appendix D.7 Frequency distribution of the number of Channel Catfish sampled versus body length and weight in 1998.

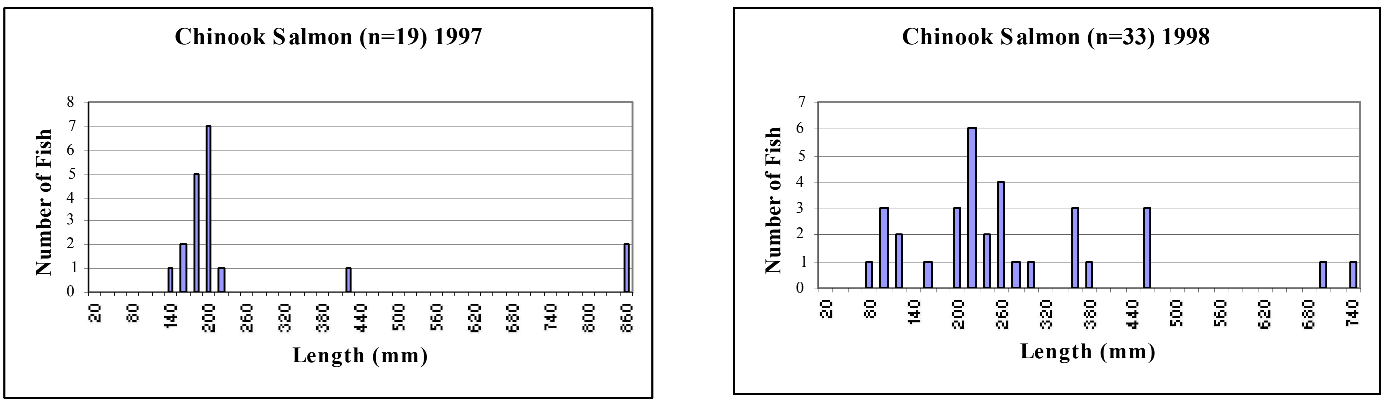




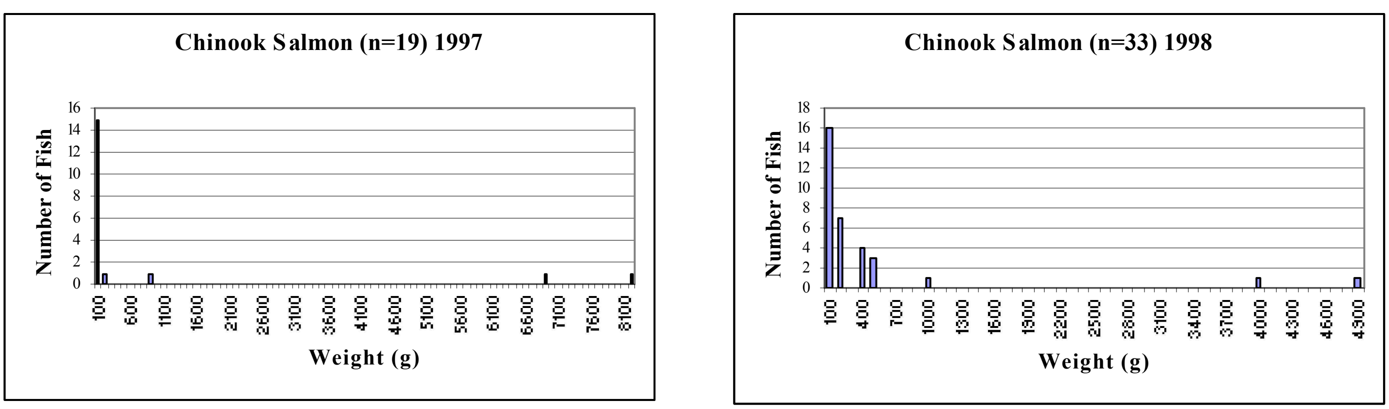
Appendix D.8 Regression equations of body length and weight versus age for Channel Catfish, in 1998.



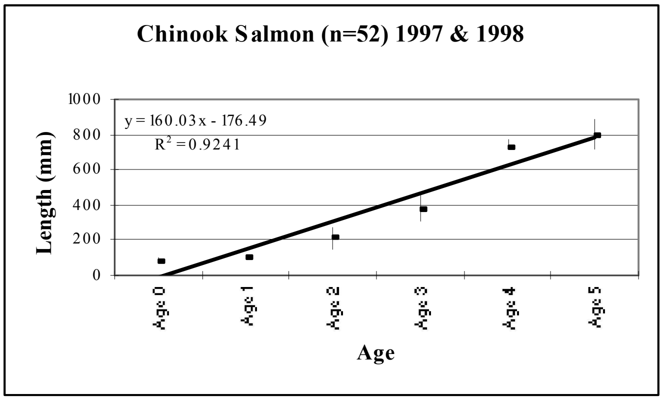
Appendix D.9 Age distribution of the number of Chinook Salmon sampled versus age in 1997 and 1998.

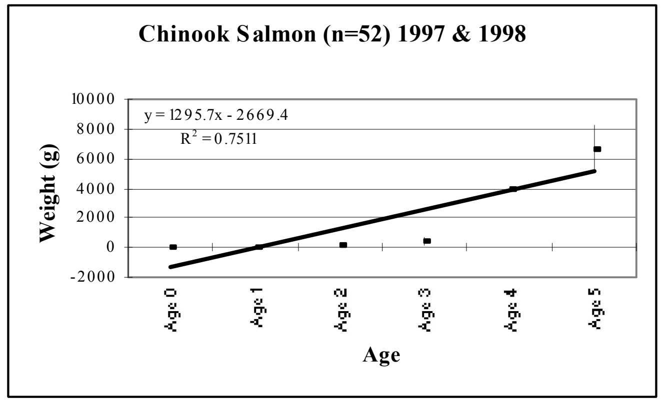


Appendix D.10 Frequency distribution of the number of Chinook Salmon sampled versus body length in 1997 and 1998.

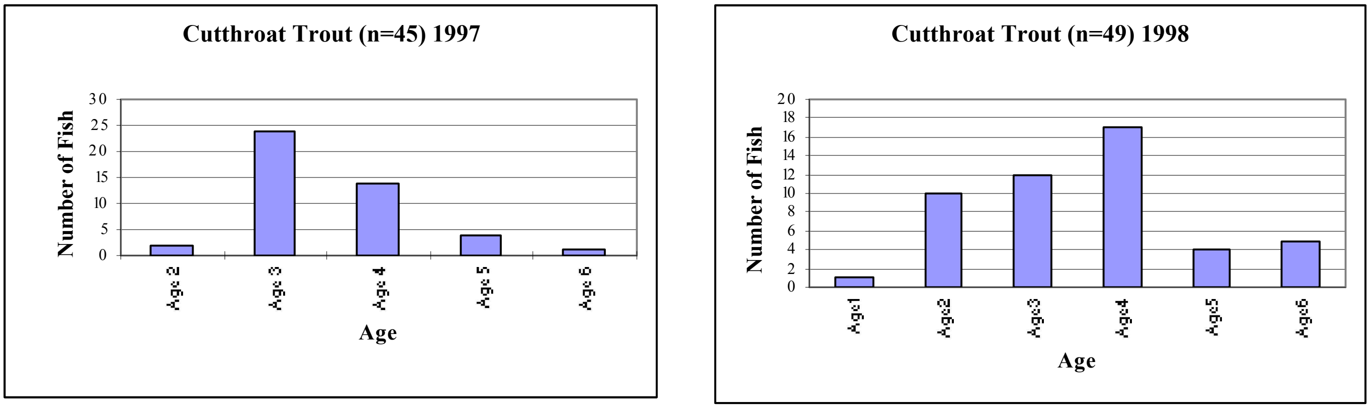


Appendix D.11 Frequency distribution of the number of Chinook Salmon sampled versus weight in 1997 and 1998.

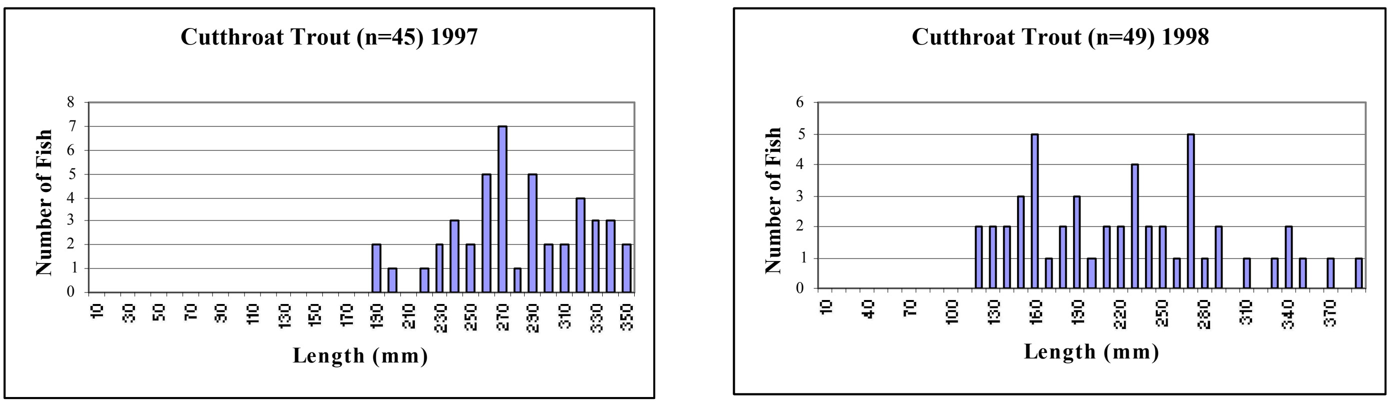




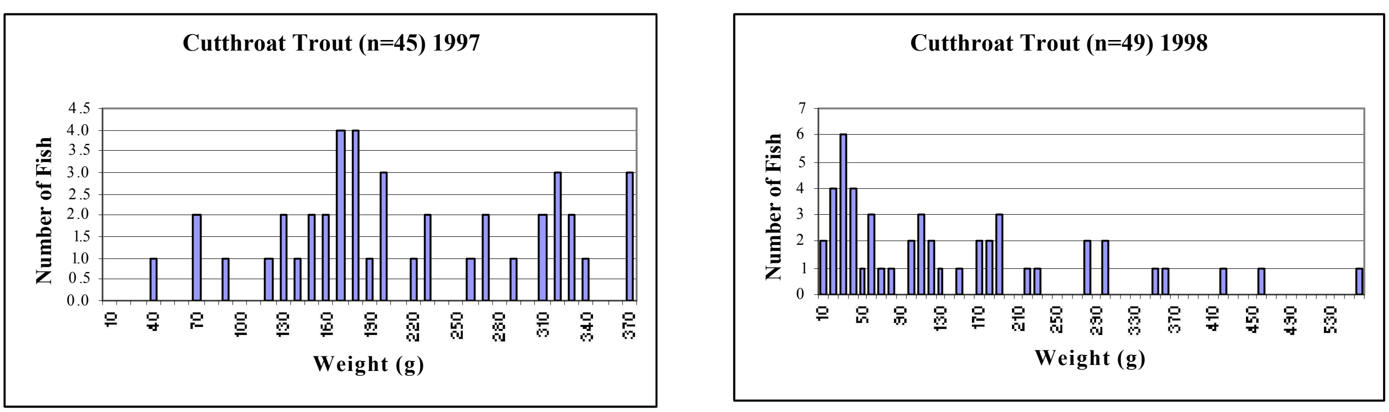
Appendix D.12 Regression equations of body length and weight versus age for Chinook Salmon, combined 1997 and 1998 data.



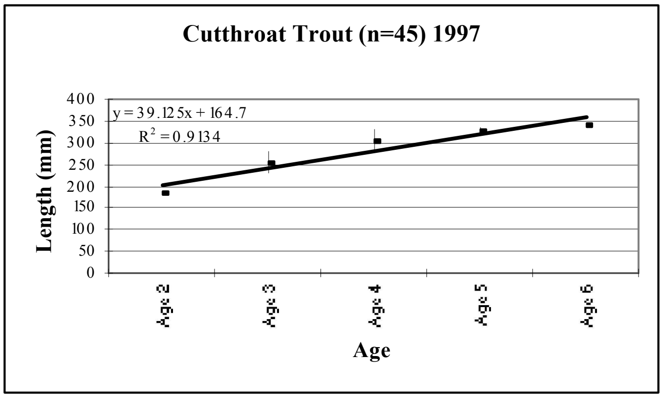
Appendix D.13 Age distribution of the number of Cutthroat Trout sampled versus age in 1997 and 1998.

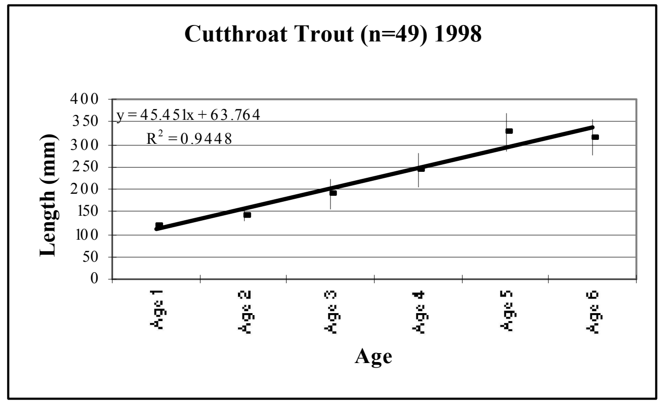


Appendix D.14 Frequency distribution of the number of Cutthroat Trout sampled versus body length in 1997 and 1998.

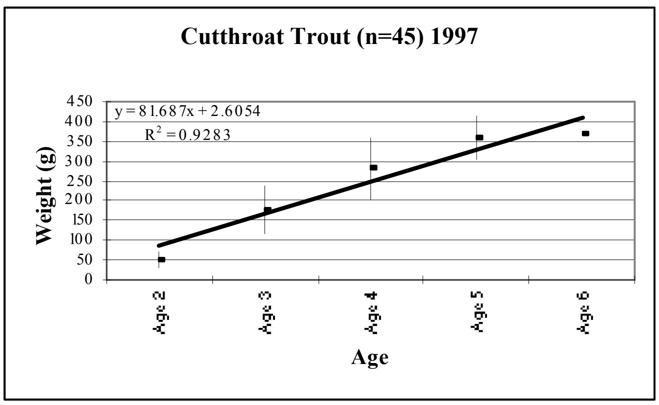


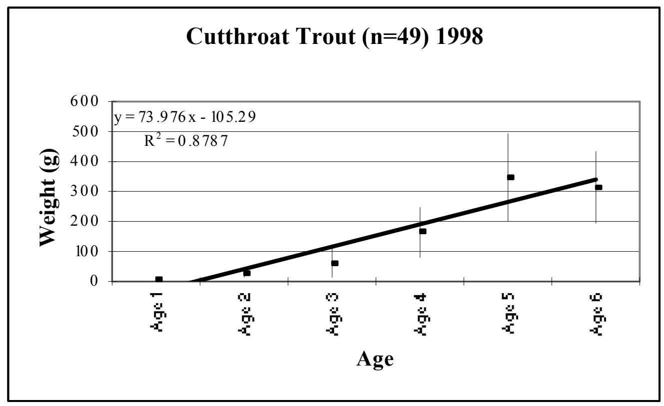
Appendix D.15 Frequency distribution of the number of Cutthroat Trout sampled versus weight in 1997 and 1998.



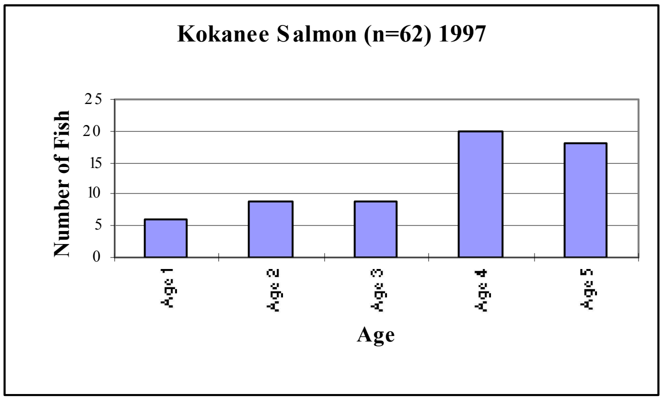


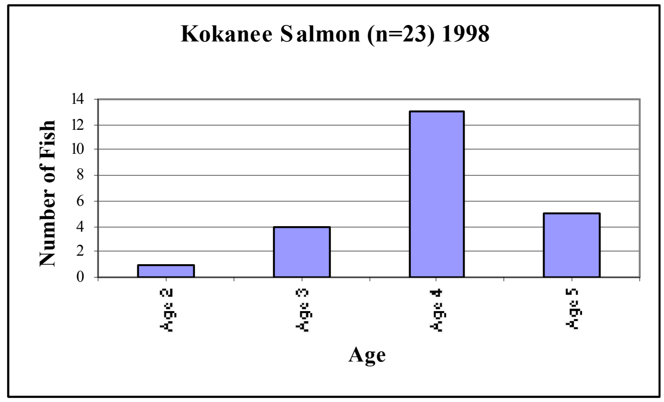
Appendix D.16 Regression equations of body length versus age for Cutthroat Trout, in 1997 and 1998.



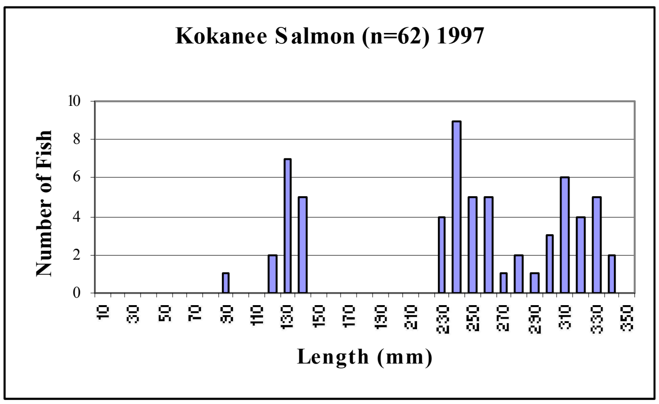


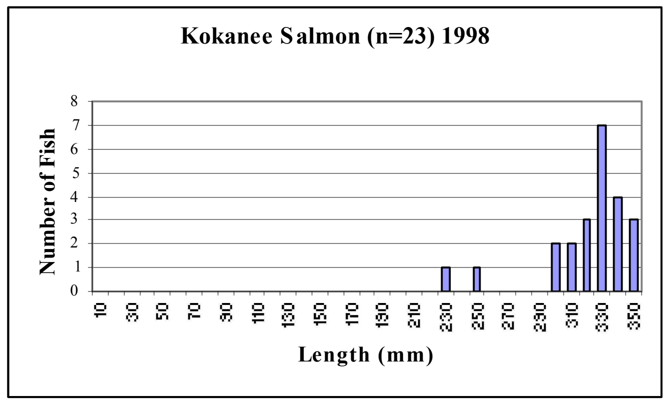
Appendix D.17 Regression equations of and weight versus age for Cutthroat Trout, in 1997 and 1998.



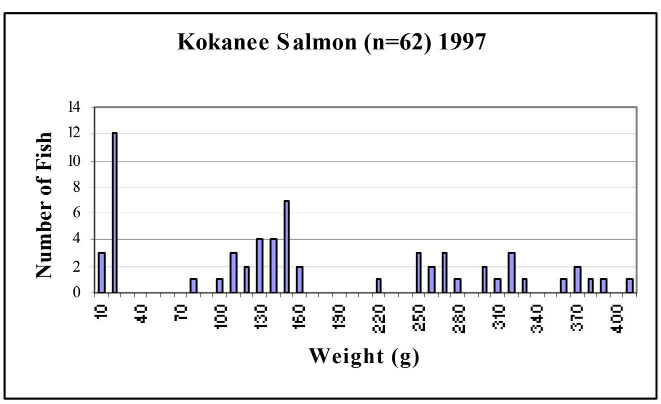


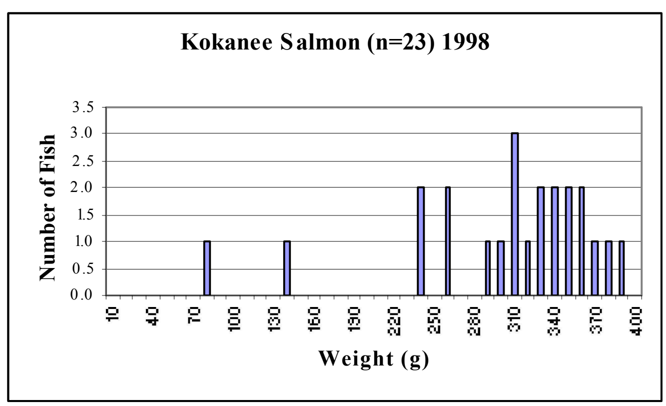
Appendix D.18 Age distribution of the number of Kokanee Salmon sampled versus age in 1997 and 1998.



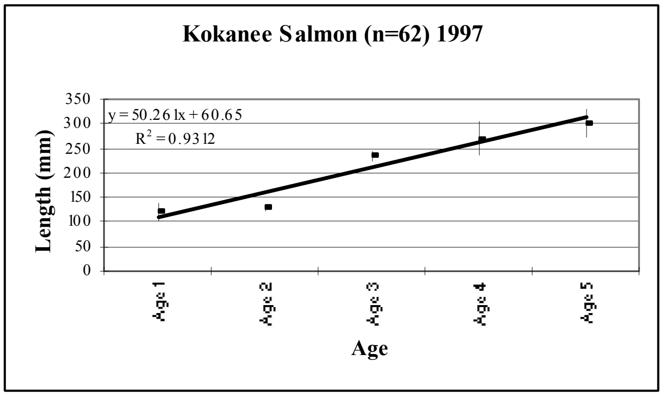


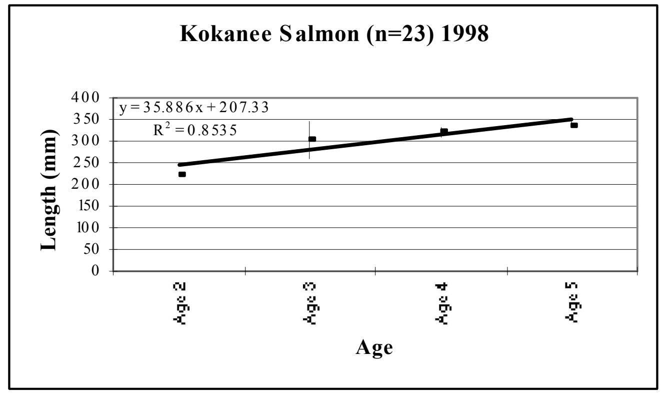
Appendix D.19 Frequency distribution of the number of Kokanee Salmon sampled versus body length in 1997 and 1998.



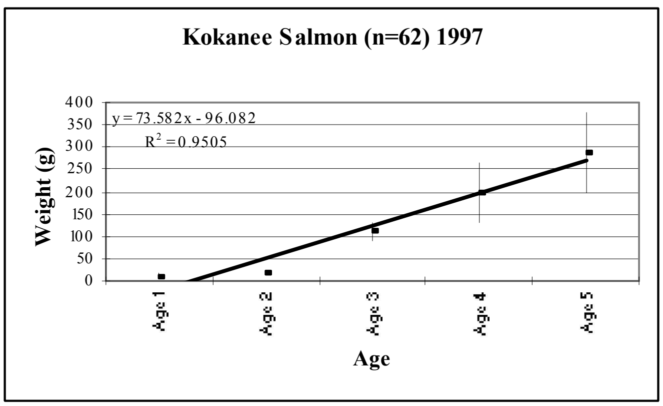


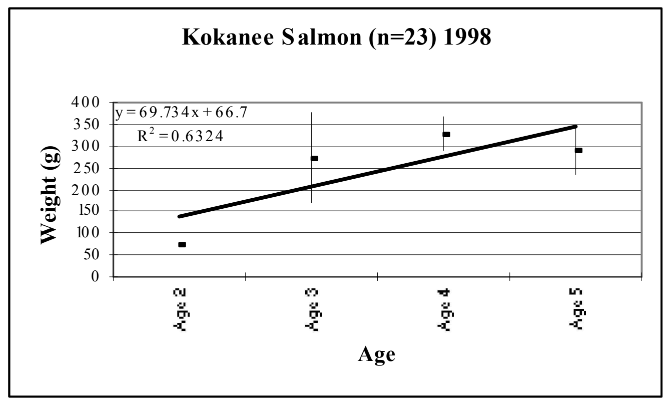
Appendix D.20 Frequency distribution of the number of Kokanee Salmon sampled versus weight in 1997 and 1998.



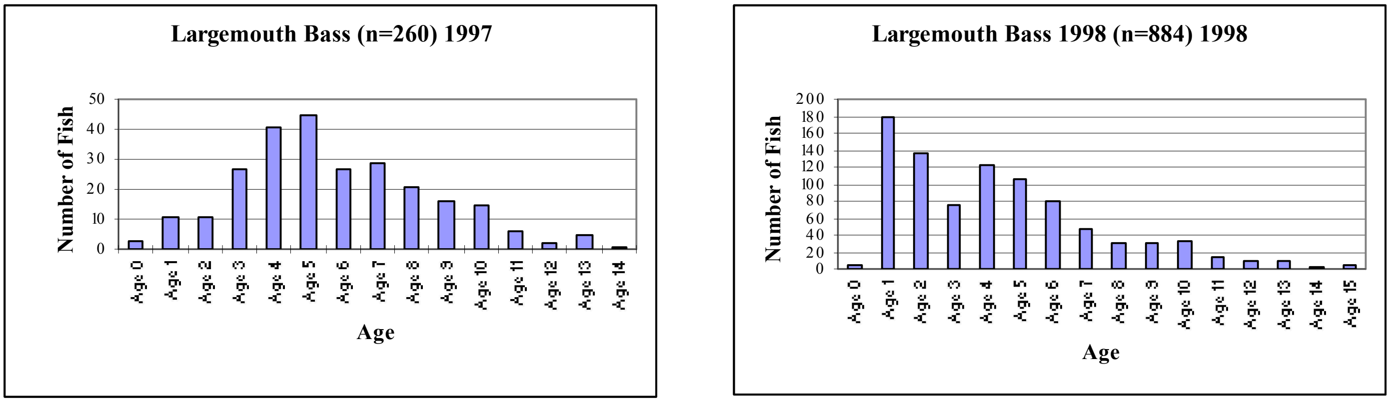


Appendix D.21 Regression equations of body length versus age for Kokanee Salmon, in 1997 and 1998.

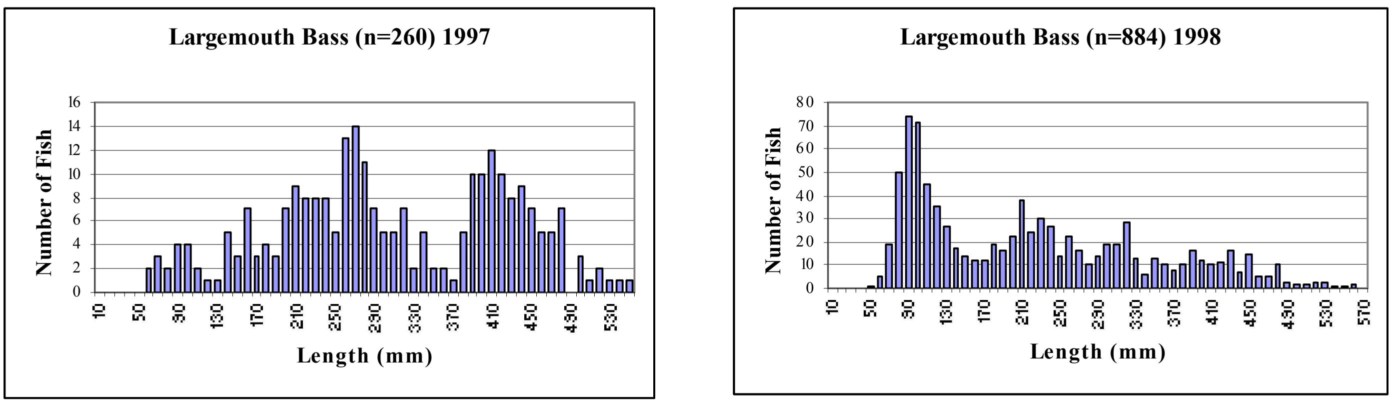




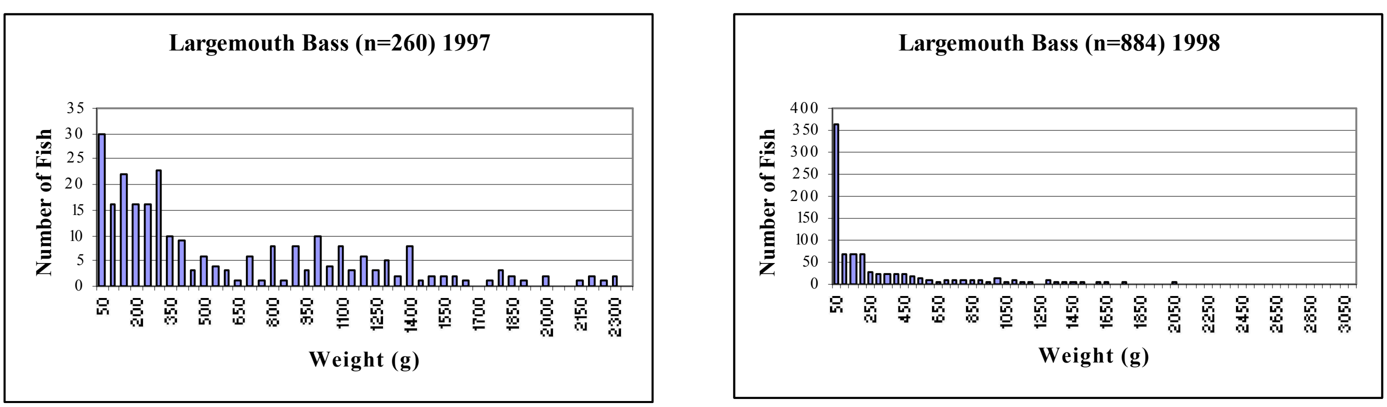
Appendix D.22 Regression equations of weight versus age for Kokanee Salmon, in 1997 and 1998.



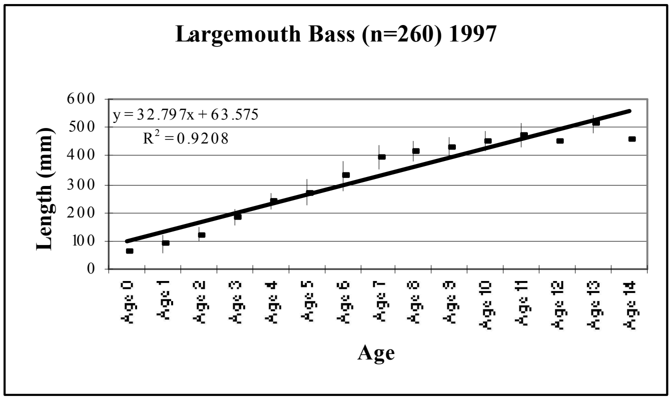
Appendix D.23 Age distribution of the number of Largemouth Bass sampled versus age in 1997 and 1998.

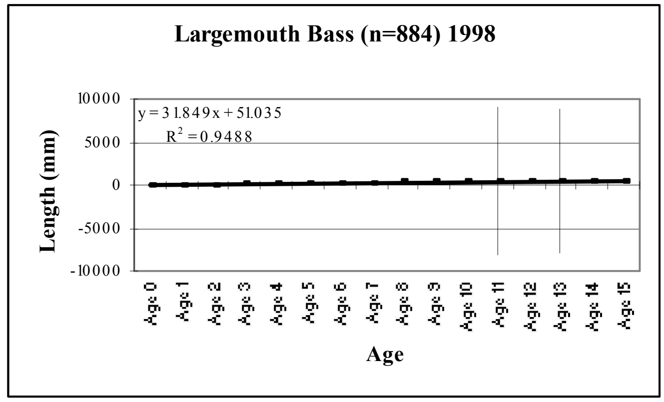


Appendix D.24 Frequency distribution of the number of Largemouth Bass sampled versus body length in 1997 and 1998.

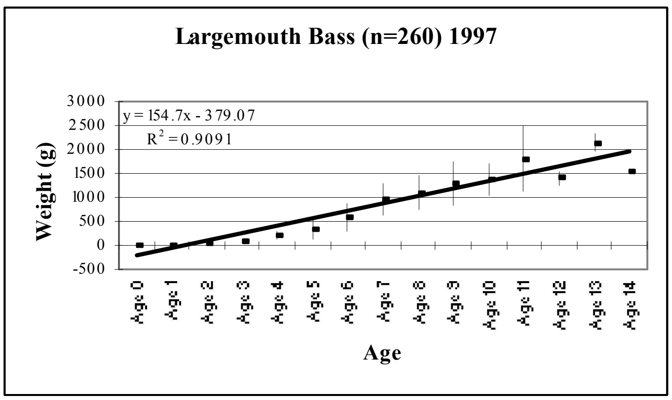


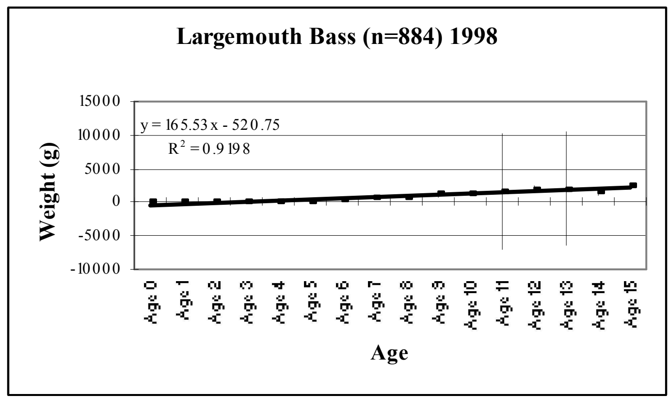
Appendix D.25 Frequency distribution of the number of Largemouth Bass sampled versus weight in 1997 and 1998.



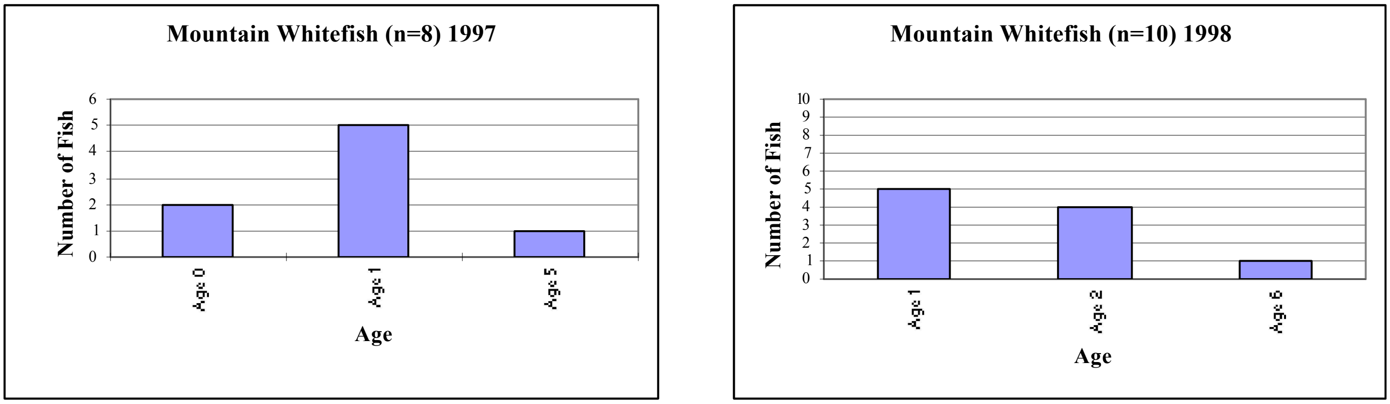


Appendix D.26 Regression equations of body length versus age for Largemouth Bass, in 1997 and 1998.

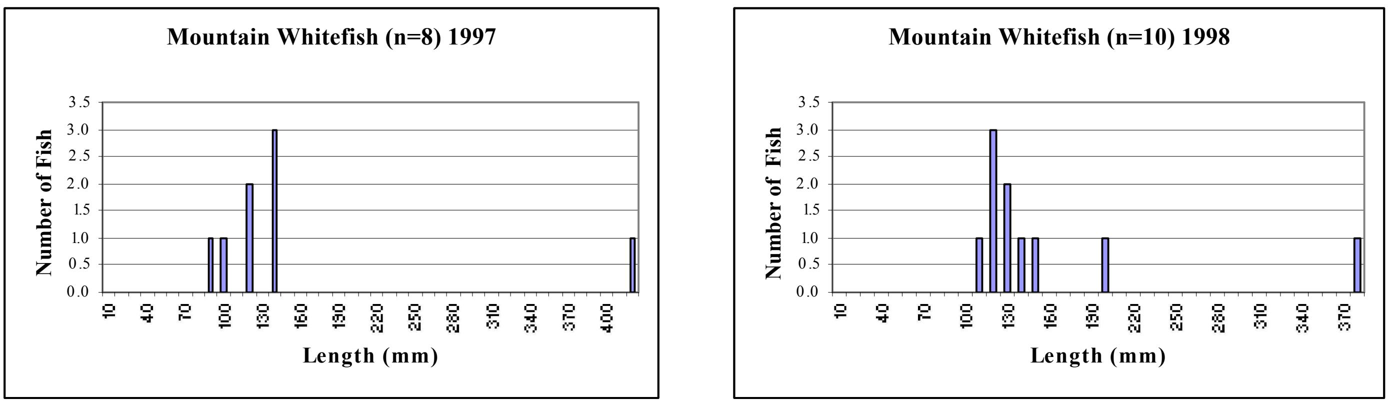




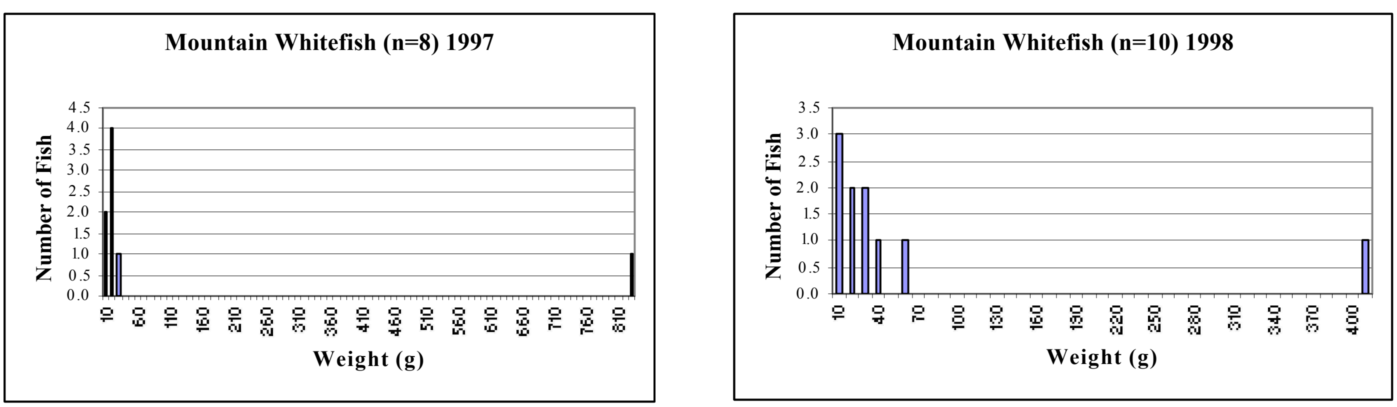
Appendix D.27 Regression equations of weight versus age for Largemouth Bass, in 1997 and 1998.



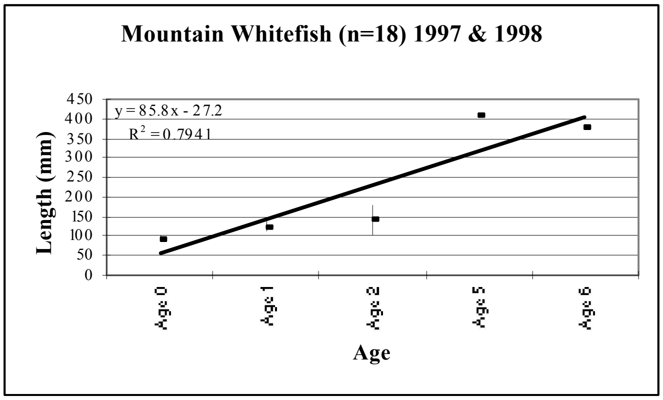
Appendix D.28 Age distribution of the number of Mountain Whitefish sampled versus age in 1997 and 1998.

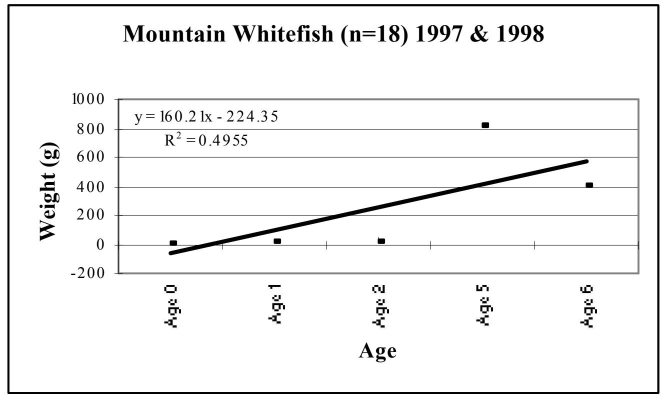


Appendix D.29 Frequency distribution of the number of Mountain Whitefish sampled versus body length in 1997 and 1998.

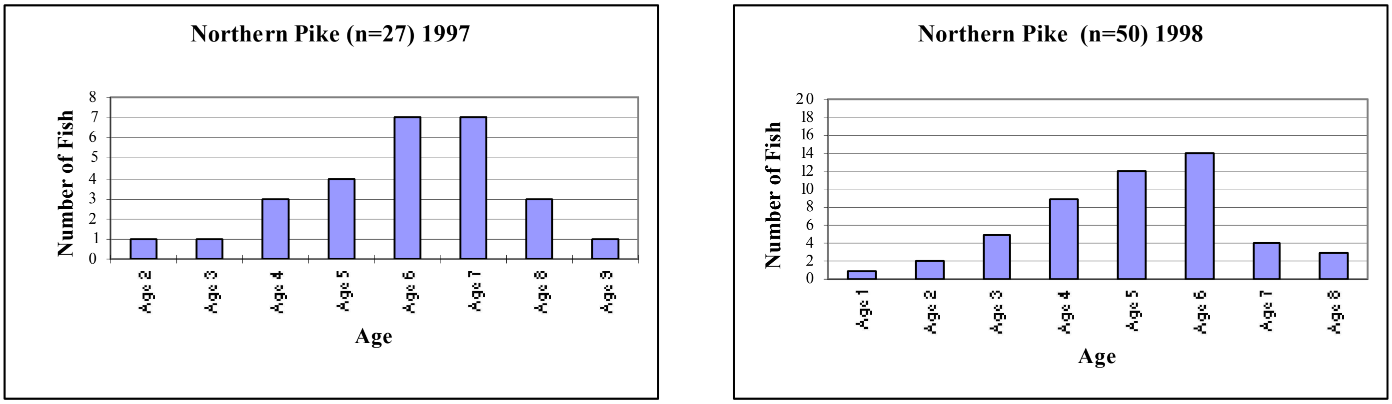


Appendix D.30 Frequency distribution of the number of Mountain Whitefish sampled versus weight in 1997 and 1998.

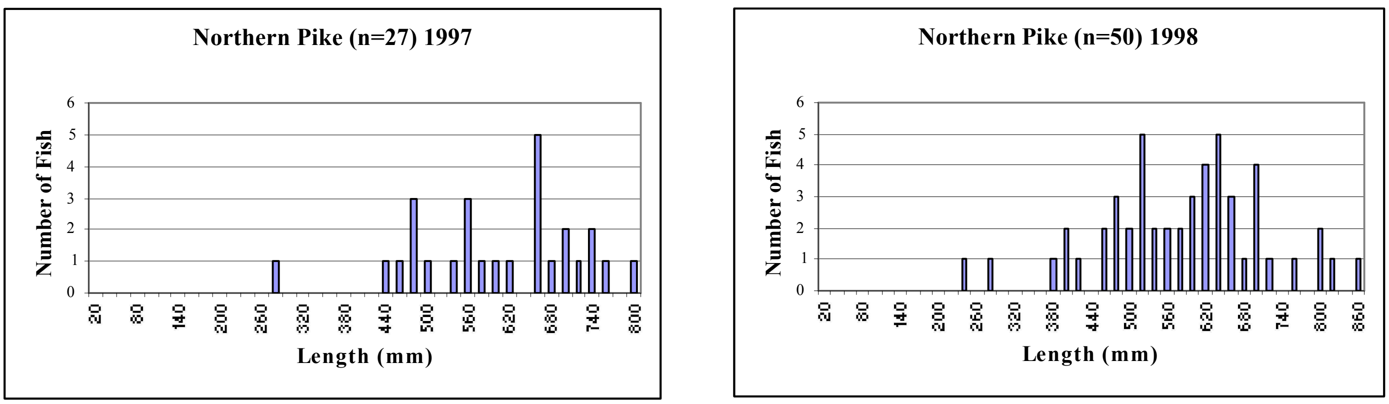




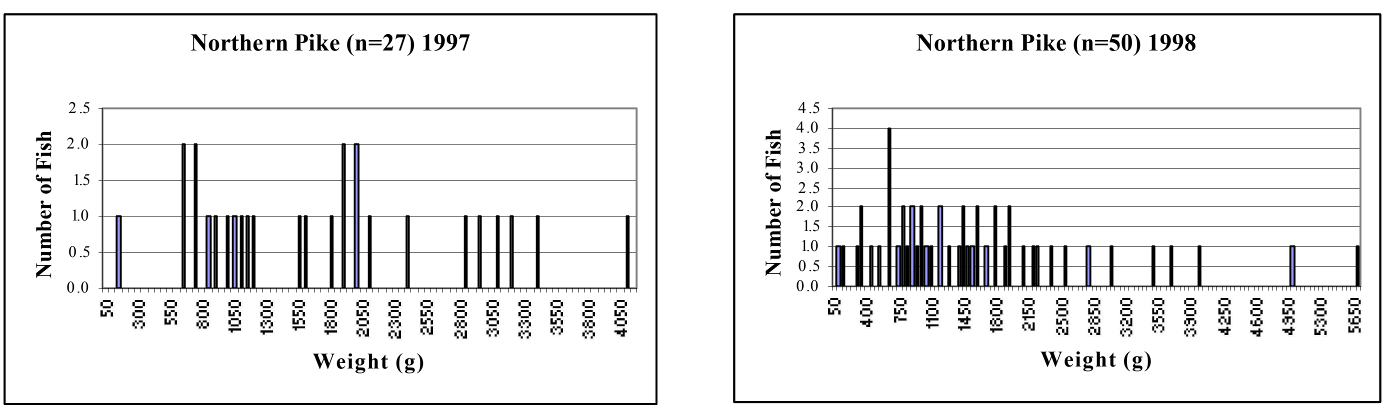
Appendix D.31 Regression equations of body length and weight versus age for Mountain Whitefish, combined 1997 and 1998 data.



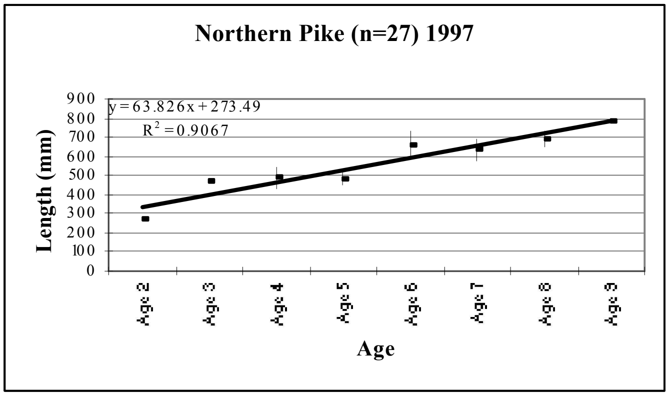
Appendix D.32 Age distribution of the number of Northern Pike sampled versus age in 1997 and 1998.

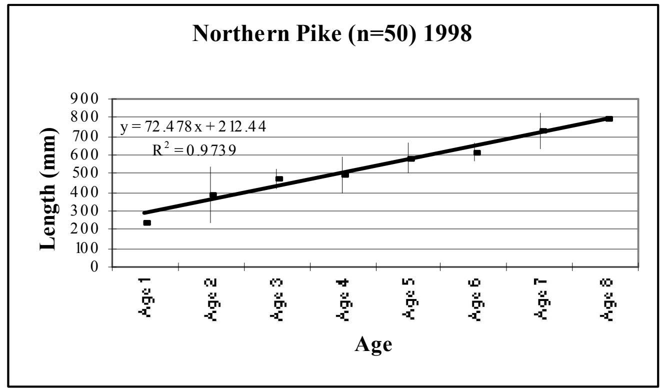


Appendix D.33 Frequency distribution of the number of Northern Pike sampled versus body length in 1997 and 1998.

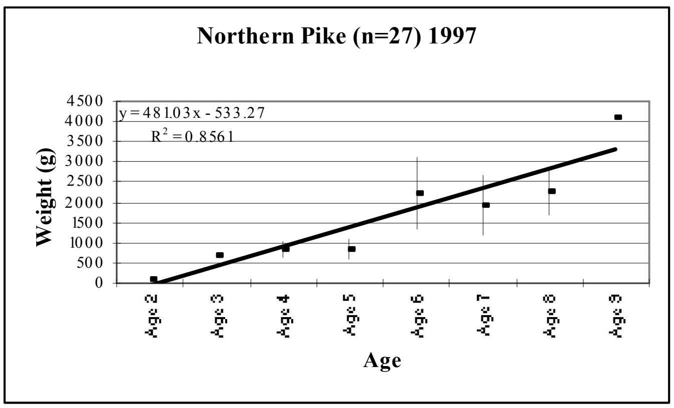


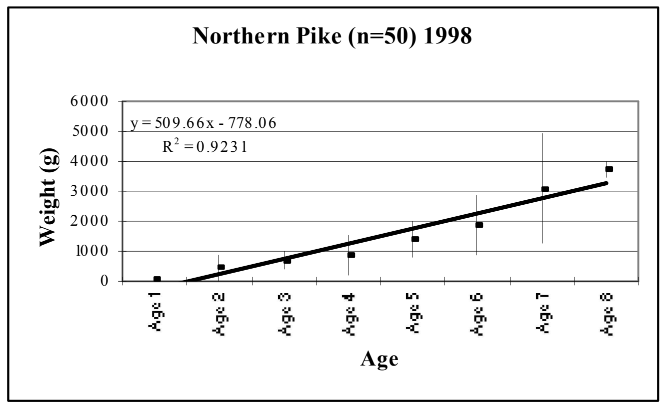
Appendix D.34 Frequency distribution of the number of Northern Pike sampled versus weight in 1997 and 1998.



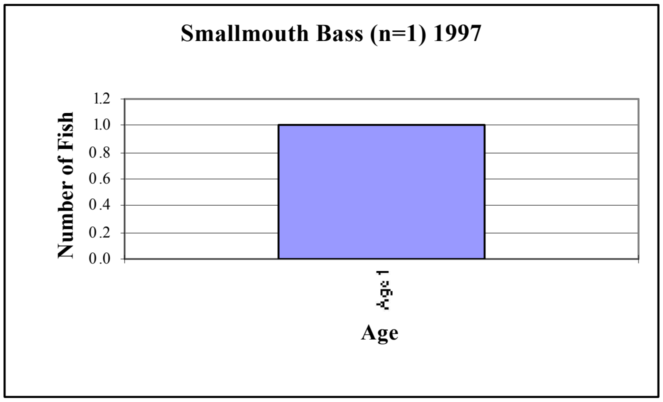


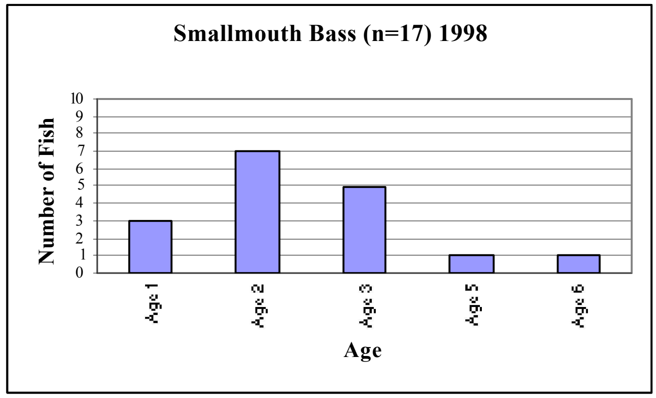
Appendix D.35 Regression equations of body length versus age for Northern Pike, in 1997 and 1998.



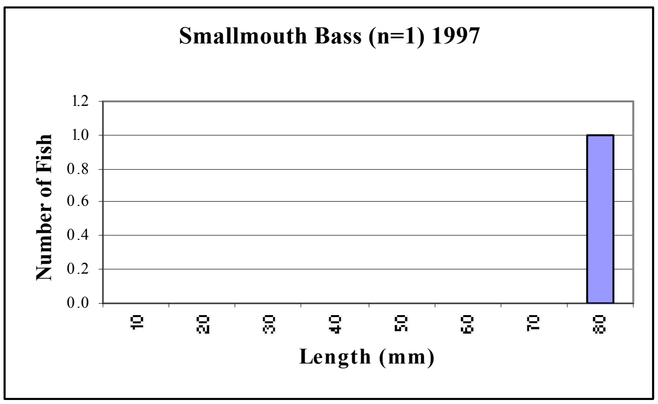


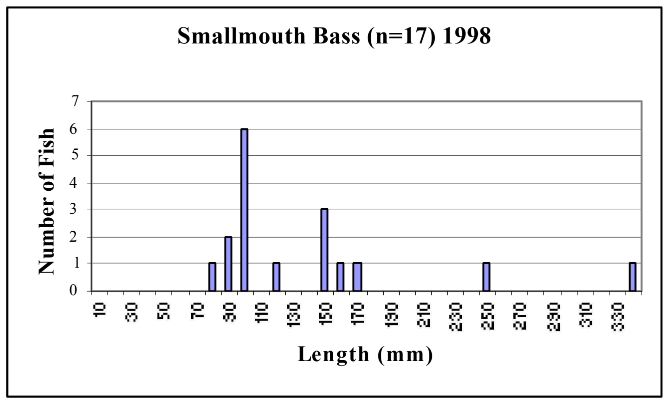
Appendix D.36 Regression equations of weight versus age for Northern Pike, in 1997 and 1998.



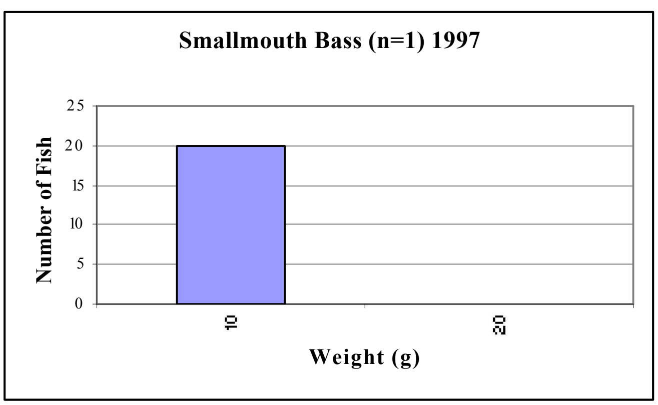


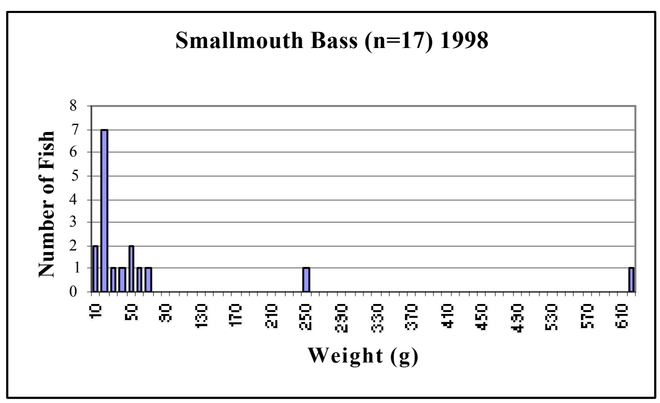
Appendix D.37 Age distribution of the number of Smallmouth Bass sampled versus age during 1997 and 1998.



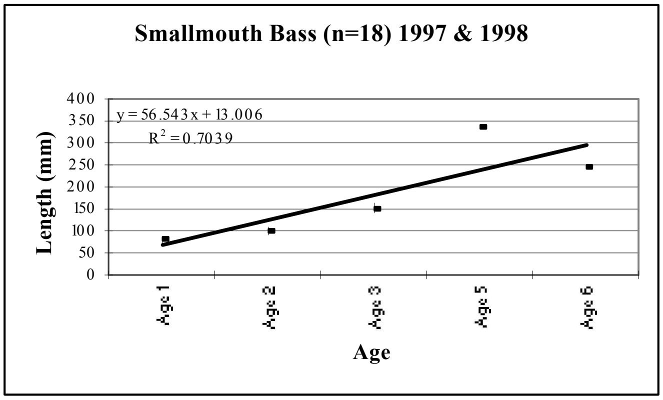


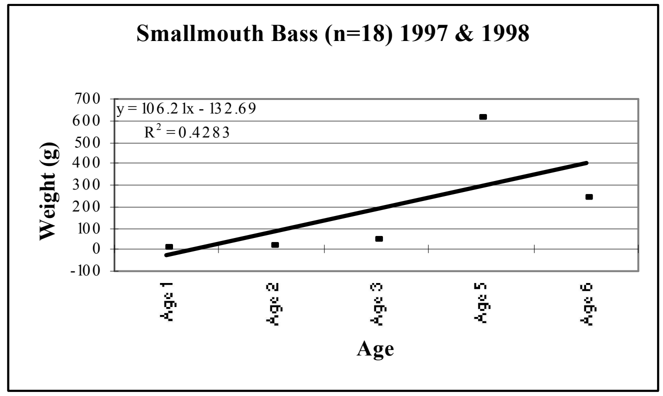
Appendix D.38 Frequency distribution of the number of Smallmouth Bass sampled versus body length during 1997 and 1998.



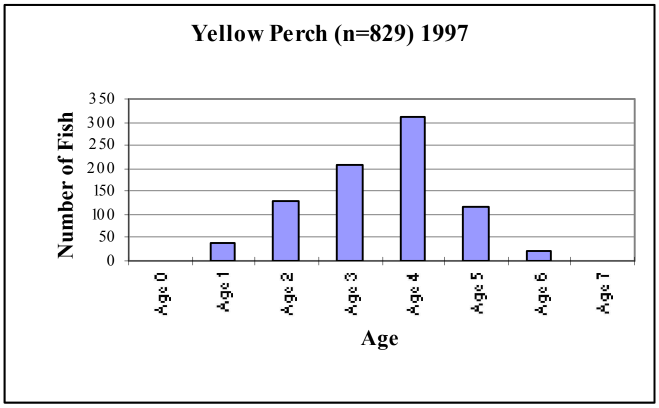


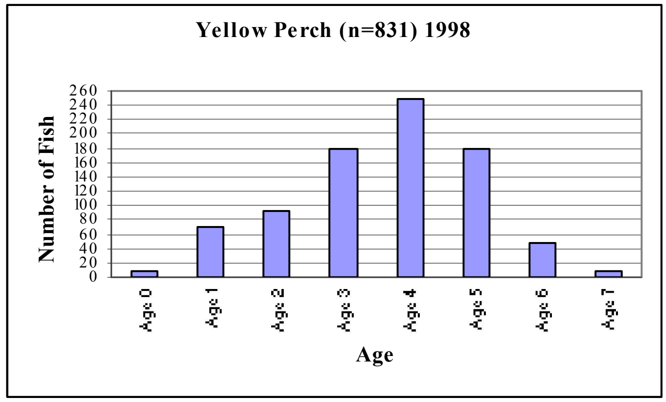
Appendix D.39 Frequency distribution of the number of Smallmouth Bass sampled versus weight during 1997 and 1998.



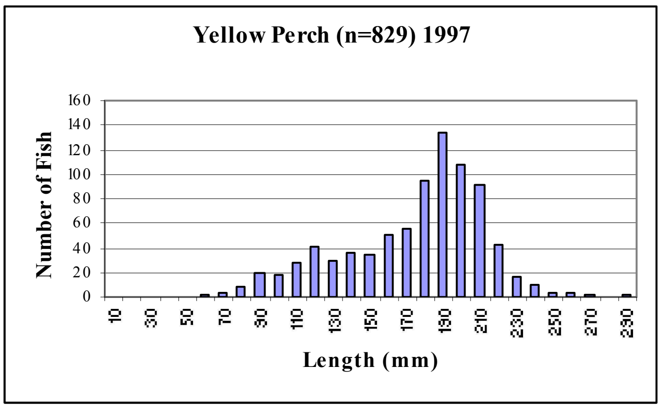


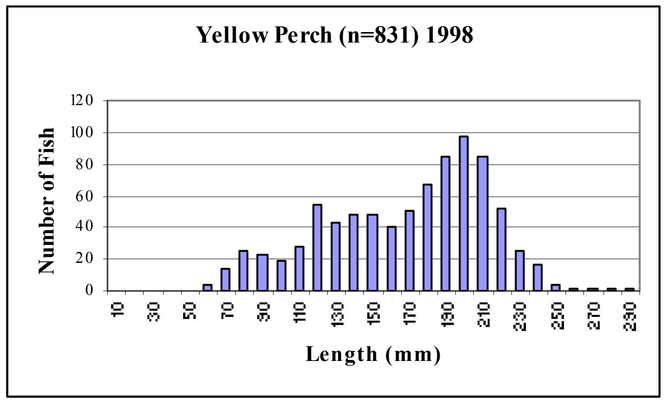
Appendix D.40 Regression equations of body length and weight versus age for Smallmouth Bass, combined 1997 and 1998 data.



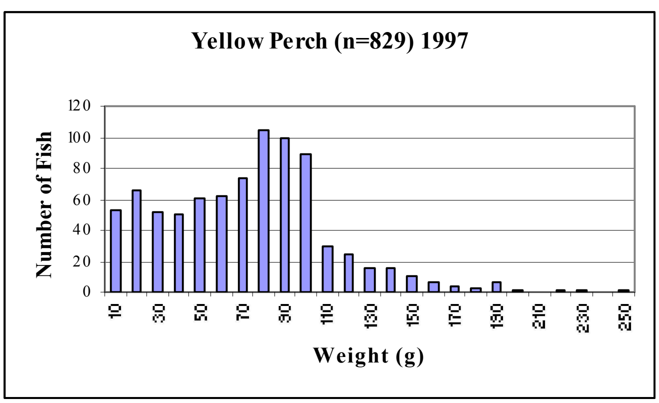


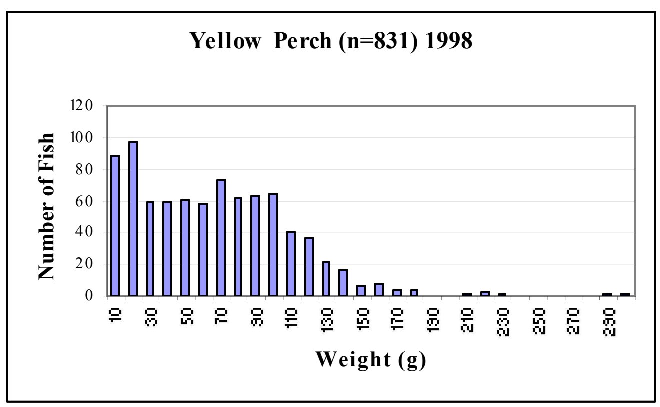
Appendix D.41 Age distribution of the number of Yellow Perch sampled versus age in 1997 and 1998.



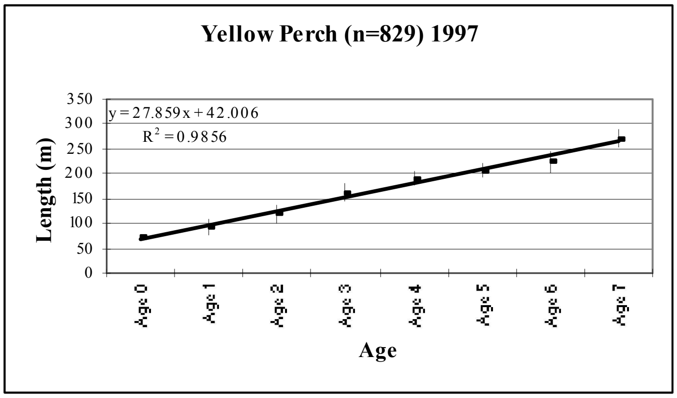


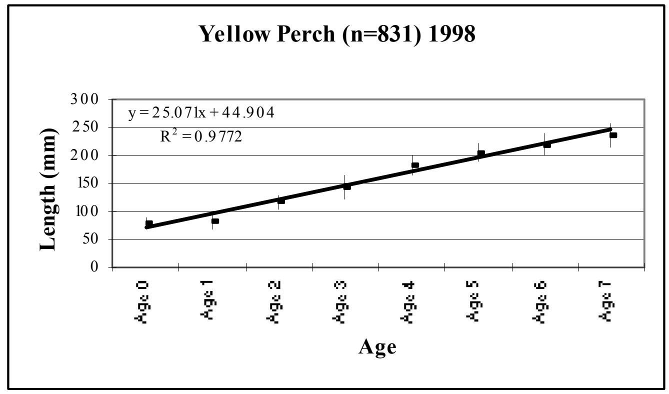
Appendix D.42 Frequency distribution of the number of Yellow Perch sampled versus body length in 1997 and 1998.



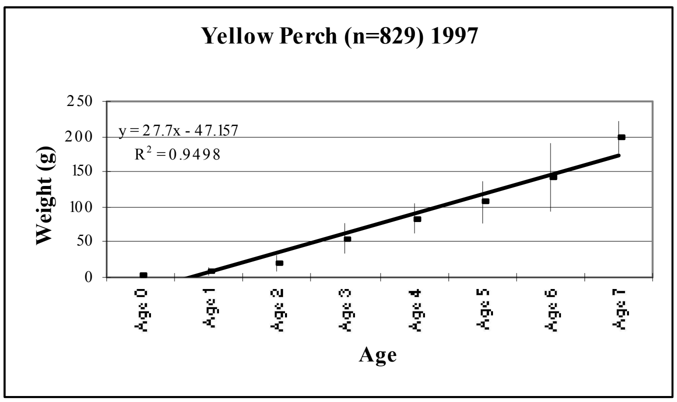


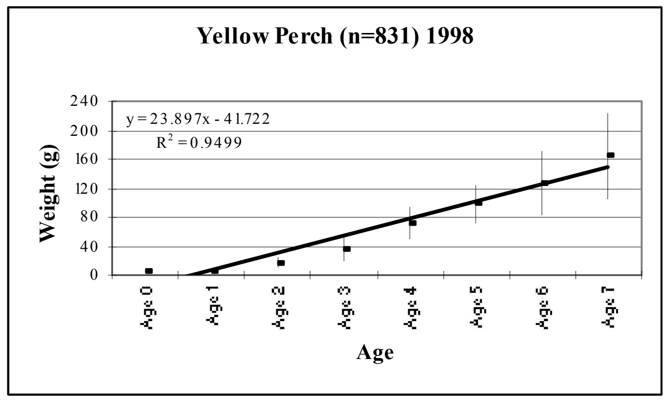
Appendix D.43 Frequency distribution of the number of Yellow Perch sampled versus weight in 1997 and 1998.





Appendix D.44 Regression equations of body length versus age for Yellow Perch, in 1997 and 1998.





Appendix D.45 Regression equations of weight versus age for Yellow Perch, in 1997 and 1998.

Appendix E

Statistics of mean length and weight, standard deviation and range
for all aged species sampled in Coeur d'Alene Lake, 1997 and 1998.

Appendix E.1 Mean length and weight, standard deviation and range for aged Black Crappie in 1997 and 1998.

		1997 (n=247)		1998 (n=678)	
Age	Statistics	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Age 0	Mean	-	-	62.60	3.00
	Standard Deviation	-	-	6.85	1.33
	Range	-	-	53-75	1-5
Age 1	Mean	95.25	9.63	79.47	7.25
	Standard Deviation	9.64	3.03	10.46	2.65
	Range	77-107	6-17	56-102	4-13
Age 2	Mean	106.60	19.46	102.35	13.75
	Standard Deviation	13.89	9.68	10.42	6.70
	Range	81-118	8-62	75-150	3-54
Age 3	Mean	154.56	59.79	133.99	35.73
	Standard Deviation	34.85	41.39	14.63	12.42
	Range	34.85	41.39	97-183	10-70
Age 4	Mean	192.61	110.16	156.36	61.41
	Standard Deviation	11.61	23.15	18.05	30.08
	Range	160-214	50-191	115-229	26-314
Age 5	Mean	204.87	132.94	187.03	106.15
	Standard Deviation	14.25	31.62	28.33	43.43
	Range	14.25	31.62	148-240	50-207
Age 6	Mean	216.33	152.67	221.15	171.38
	Standard Deviation	13.85	33.93	18.59	38.91
	Range	199-247	100-226	170-260	76-297
Age 7	Mean	212.00	168.00	241.00	230.69
	Standard Deviation	-	-	33.02	141.99
	Range	-	-	200-342	118-690

- Only one fish was caught in this age class or zero fish were sampled.

Appendix E.2 Mean length and weight, standard deviation and range for aged Channel Catfish during 1998.

		1998 (n=5)	
Age	Statistics	Length (mm)	Weight (g)
Age 1	Mean	216	75
	Standard Deviation	-	-
	Range	-	-
Age 4	Mean	465	1365
	Standard Deviation	-	-
	Range	-	-
Age 5	Mean	574.00	2366.50
	Standard Deviation	79.20	702.16
	Range	518-630	1870-2863
Age 7	Mean	570	2541
	Standard Deviation	-	-
	Range	-	-

- Only one fish was caught in this age class or zero fish were sampled.

Appendix E.3 Mean length and weight, standard deviation and range for aged Chinook Salmon in 1997 and 1998.

		1997 (n=19)		1998 (n=33)	
Age	Statistics	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Age 0	Mean	-	-	85	4.5
	Standard Deviation	-	-	14.14	0.71
	Range	-	-	75-95	4-5
Age 1	Mean	-	-	100.00	5.25
	Standard Deviation	-	-	12.25	2.63
	Range	-	-	85-110	3-8
Age 2	Mean	177.69	64.88	245.35	188.20
	Standard Deviation	19.30	36.25	68.48	216.32
	Range	138-210	27-185	143-443	30-972
Age 3	Mean	413	830	374	353.2
	Standard Deviation	-	-	83.20	141.91
	Range	-	-	250-449	116-500
Age 4	Mean	-	-	722	4000
	Standard Deviation	-	-	-	-
	Range	-	-	-	-
Age 5	Mean	848.5	7483.5	700	4886
	Standard Deviation	9.19	962.37	-	-
	Range	842-855	6803-8164	-	-

- Only one fish was caught in this age class or zero fish were sampled.

Appendix E.4 Mean length and weight, standard deviation and range for aged Cutthroat Trout in 1997 and 1998.

		1997 (n=45)		1998 (n=49)	
Age	Statistics	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Age 1	Mean	-	-	120	10
	Standard Deviation	-	-	-	-
	Range	-	-	-	-
Age 2	Mean	182.50	51.50	141.40	24.70
	Standard Deviation	0.71	19.09	13.53	8.67
	Range	182-183	38-65	120-160	10-36
Age 3	Mean	254.75	176.88	189.08	62.00
	Standard Deviation	27.12	60.70	33.46	49.00
	Range	194-315	63-312	152-267	16-186
Age 4	Mean	304.14	281.21	243.82	163.76
	Standard Deviation	25.80	76.46	37.28	83.32
	Range	260-344	154-374	185-290	59-300
Age 5	Mean	327.00	360.75	326.75	347.50
	Standard Deviation	10.61	55.16	43.15	148.68
	Range	312-335	308-420	280-382	215-555
Age 6	Mean	342	368	316.00	313.80
	Standard Deviation	-	-	41.70	118.56
	Range	-	-	265-367	184-455

- Only one fish was caught in this age class or zero fish were sampled.

Appendix E.5 Mean length and weight, standard deviation and range for aged Kokanee Salmon in 1997 and 1998.

		1997 (n=62)		1998 (n=23)	
Age	Statistics	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Age 1	Mean	120.83	11.00	-	-
	Standard Deviation	17.88	5.10	-	-
	Range	87-140	4-15	-	-
Age 2	Mean	129.22	15.78	225	75
	Standard Deviation	6.12	2.68	-	-
	Range	120-135	14-19	-	-
Age 3	Mean	235.11	110.67	303.25	272
	Standard Deviation	9.91	19.09	42.14	103.94
	Range	222-250	74-135	245-338	132-352
Age 4	Mean	235.11	110.67	321.31	328.54
	Standard Deviation	9.91	19.09	11.44	37.63
	Range	222-250	74-135	300-343	257-390
Age 5	Mean	301.50	287.72	338.60	288.60
	Standard Deviation	28.11	89.05	5.90	52.19
	Range	251-340	140-402	333-345	232-338

- Only one fish was caught in this age class or zero fish were sampled.

Appendix E.6 Mean length and weight, standard deviation and range for aged Largemouth Bass in 1997 and 1998.

		1997 (n=260)		1998 (n=884)	
Age	Statistics	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Age 0	Mean	64.33	4.67	66.00	3.50
	Standard Deviation	4.04	2.52	14.94	1.29
	Range	60-68	2-7	49-85	2-5
Age 1	Mean	90.55	14.91	84.92	8.03
	Standard Deviation	31.55	25.82	14.46	3.35
	Range	58-175	1-92	54-196	1-18
Age 2	Mean	122.18	29.55	107.98	16.74
	Standard Deviation	23.65	15.51	16.15	8.88
	Range	90-156	11-59	80-175	5-64
Age 3	Mean	180.15	82.81	158.41	53.45
	Standard Deviation	28.16	43.66	29.19	31.06
	Range	134-270	34-250	100-240	12-156
Age 4	Mean	240.80	209.95	212.17	137.23
	Standard Deviation	29.91	81.56	39.58	75.90
	Range	159-290	56-415	147-421	38-457
Age 5	Mean	271.40	325.47	252.13	231.49
	Standard Deviation	47.97	202.41	33.34	104.71
	Range	162-404	120-1000	186-346	79-630
Age 6	Mean	330.59	572.93	302.90	444.00
	Standard Deviation	53.87	281.38	42.32	220.24
	Range	249-410	222-1040	210-380	116-1255
Age 7	Mean	392.69	966.72	338.02	598.81
	Standard Deviation	42.99	342.13	42.73	285.62
	Range	310-470	400-1820	250-460	241-1600
Age 8	Mean	413.48	1091.71	372.10	796.87
	Standard Deviation	35.58	353.08	37.09	232.48
	Range	338-473	544-2000	290-445	342-1465
Age 9	Mean	428.69	1291.00	422.26	1161.32
	Standard Deviation	35.33	456.60	31.18	346.08
	Range	361-480	700-2200	365-492	411-2016
Age 10	Mean	449.40	1385.67	428.50	1281.63
	Standard Deviation	35.58	335.54	26.11	292.96
	Range	406-515	884-1850	380-494	705-1960
Age 11	Mean	476.00	1812.50	452.93	1507.79
	Standard Deviation	42.09	676.71	8676.44	8676.44
	Range	428-536	1075-2600	396-560	452-2832
Age 12	Mean	455.00	1400.00	489.80	1953.70
	Standard Deviation	7.07	141.42	27.35	477.91
	Range	450-460	1300-1500	460-530	1396-2800
Age 13	Mean	512.00	2140.00	495.44	2031.44
	Standard Deviation	28.84	181.66	8445.62	8445.62
	Range	468-546	1900-2300	410-560	1183-3073
Age 14	Mean	462	1550	460.00	1528.50
	Standard Deviation	-	-	28.28	535.28
	Range	-	-	440-480	1150-1907
Age 15	Mean	-	-	504.50	2426.00
	Standard Deviation	-	-	21.93	380.59
	Range	-	-	484-532	1893-2744

- Only one fish was caught in this age class or zero fish were sampled.

Appendix E.7 Mean length and weight, standard deviation and range for aged Mountain Whitefish in 1997 and 1998.

		1997 (n=8)		1998 (n=10)	
Age	Statistics	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Age 0	Mean	94.00	9.50	-	-
	Standard Deviation	8.49	2.12	-	-
	Range	88-100	8-11	-	-
Age 1	Mean	126.20	15.80	123.80	16.00
	Standard Deviation	11.90	5.40	14.41	11.07
	Range	112-138	7-21	104-141	4-32
Age 2	Mean	-	-	141.00	25.00
	Standard Deviation	-	-	36.99	20.35
	Range	-	-	117-195	9-54
Age 5	Mean	411	825	-	-
	Standard Deviation	-	-	-	-
	Range	-	-	-	-
Age 6	Mean	-	-	380	406
	Standard Deviation	-	-	-	-
	Range	-	-	-	-

- Only one fish was caught in this age class or zero fish were sampled.

Appendix E.8 Mean length and weight, standard deviation and range for aged Northern Pike in 1997 and 1998.

		1997 (n=27)		1998 (n=50)	
Age	Statistics	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Age 1	Mean	-	-	240	74
	Standard Deviation	-	-	-	-
	Range	-	-	-	-
Age 2	Mean	267.00	120.00	385.50	445.00
	Standard Deviation	-	-	149.20	431.34
	Range	-	-	280-491	140-750
Age 3	Mean	470.00	710.00	472.60	679.00
	Standard Deviation	-	-	53.42	308.90
	Range	-	-	400-550	350-1191
Age 4	Mean	491.67	833.33	492.44	866.89
	Standard Deviation	57.50	201.08	91.76	667.08
	Range	434-549	610-1000	380-690	271-2520
Age 5	Mean	485.75	845.00	583.75	1387.58
	Standard Deviation	38.80	250.53	83.89	610.26
	Range	448-540	620-1200	415-705	431-2377
Age 6	Mean	655.57	2226.43	615.36	1860.07
	Standard Deviation	74.47	881.83	49.02	1008.42
	Range	550-750	1120-3390	505-691	983-4960
Age 7	Mean	636.29	1932.86	728.75	3092.50
	Standard Deviation	57.74	750.48	98.17	1845.63
	Range	545-716	1030-3200	620-851	1442-5690
Age 8	Mean	689.33	2283.33	790.33	3718.33
	Standard Deviation	39.00	579.51	9.24	272.96
	Range	650-728	1900-2950	785-801	3455-4000
Age 9	Mean	790	4100	-	-
	Standard Deviation	-	-	-	-
	Range	-	-	-	-

- Only one fish was caught in this age class or zero fish were sampled.

Appendix E.9 Mean length and weight, standard deviation and range for aged Rainbow Trout in 1997 and 1998.

		1997 (n=1)		1998 (n=1)	
Age	Statistics	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Age 3	Mean	-	-	430	630
	Standard Deviation	-	-	-	-
	Range	-	-	-	-
Age 6	Mean	370	508	-	-
	Standard Deviation	-	-	-	-
	Range	-	-	-	-

- Only one fish was caught in this age class or zero fish were sampled.

Appendix E.10 Mean length and weight, standard deviation and range for aged Smallmouth Bass in 1997 and 1998.

		1997 (n=1)		1998 (n=17)	
Age	Statistics	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Age 1	Mean	75	6	83.00	10.67
	Standard Deviation	-	-	5.57	6.35
	Range	-	-	77-88	7-18
Age 2	Mean	-	-	99.57	16.86
	Standard Deviation	-	-	9.29	5.61
	Range	-	-	92-120	12-28
Age 3	Mean	-	-	151.60	48.40
	Standard Deviation	-	-	10.71	10.36
	Range	-	-	143-168	35-62
Age 5	Mean	-	-	335	612
	Standard Deviation	-	-	-	-
	Range	-	-	-	-
Age 6	Mean	-	-	246	243
	Standard Deviation	-	-	-	-
	Range	-	-	-	-

- Only one fish was caught in this age class or zero fish were sampled.

Appendix E.11 Mean length and weight, standard deviation and range for aged Yellow Perch in 1997 and 1998.

		1997 (n=829)		1998 (n=831)	
Age	Statistics	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Age 0	Mean	73	3	78.00	4.57
	Standard Deviation	-	-	10.86	1.99
	Range	-	-	61-90	2-7
Age 1	Mean	91.74	9.29	80.49	6.11
	Standard Deviation	16.34	5.58	13.12	3.21
	Range	59-124	0-20	57-115	1-18
Age 2	Mean	119.23	20.81	116.15	17.03
	Standard Deviation	18.66	11.41	13.37	6.78
	Range	80-159	4-55	85-154	4-38
Age 3	Mean	162.62	54.86	144.19	36.25
	Standard Deviation	19.38	21.49	21.06	17.35
	Range	116-208	15-165	98-215	10-116
Age 4	Mean	190.72	83.72	183.46	72.34
	Standard Deviation	14.05	20.94	17.82	22.78
	Range	125-230	24-180	126-234	18-175
Age 5	Mean	205.95	106.73	203.72	98.07
	Standard Deviation	14.78	28.64	16.18	25.85
	Range	170-251	40-190	154-244	38-180
Age 6	Mean	224.22	141.52	219.04	127.15
	Standard Deviation	22.00	47.65	18.95	44.57
	Range	186-267	72-242	190-280	63-284
Age 7	Mean	271.50	200.00	236.75	165.00
	Standard Deviation	16.26	22.63	21.02	58.91
	Range	260-283	184-216	215-283	123-293

- Only one fish was caught in this age class or zero fish were sampled.

Appendix F

Analysis of spawning gravel beds in select tributaries of the Coeur d'Alene Reservation, 1998.

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	08/24/98	**Location :**	ALDER
Initials:	GA RA	**Reach:**	9
		Site Number:	3

Spawning Gravel Analysis

% Usable Spawning Area =	5.5		
Est. % Survival to Emergence:	30.6		
Redd Potential (#):	41	**Production Index:**	2561
Bankfull Area (ft^2):	1200.0	**Gravel Quantity (ft^2):**	65.6

	Bankfull Width
1	5.0
2	6.0
3	4.0
4	6.0
5	5.0
6	8.0
7	6.0
8	4.0
9	7.0
10	9.0
Avg. Width (ft.) =	6

McNeil Core Sample

Date Processed: 12-Nov-98 **Total Dry Weight (g):** 1412

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	3	0	0
Fine Sand	0.250	3.5	0	0
Medium Sand	0.500	4.5	0	1
Coarse Sand	0.850	2	0	1
Vry Coarse Sand	1.0	15.5	1	2
Vry Fine Gravel	2.0	99.5	7	9
Fine Gravel	4.75	79.5	6	15
Fine Gravel	6.3	85.5	6	21
Medium Gravel	8.0	409.5	29	50
Coarse Gravel	16.0	655.5	47	96
Vry Coarse Gravel	31.5	49.5	4	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**1407.5**	**100**	

D_g =	9.5	% < 6.3mm	21
F_i =	6.0	% < 0.88mm	1

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	10	10	10
2-4	15	15	25
4-8	20	20	45
8-16	30	30	75
16-32	20	20	95
32-64	5	5	100
64-128		0	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	41	11	69	21	34
2	29	12	80	22	20
3	55	13	71	23	28
4	31	14	47	24	48
5	28	15	29	25	50
6	62	16	35	26	51
7	68	17	46	27	67
8	53	18	72	28	30
9	43	19	68	29	35
10	70	20	60	30	40

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} x ....x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	08/12/98	**Location :**	N.F. ALDER		
Initials:	GA RA	**Reach:**	1A	**Site Number:**	1

Spawning Gravel Analysis

% Usable Spawning Area =	4.2		
Est. % Survival to Emergence:	30.8		
Redd Potential (#):	55	**Production Index:**	3451
Bankfull Area (ft^2):	2080.0	**Gravel Quantity (ft^2):**	88.0

	Bankfull Width
1	14.0
2	10.0
3	10.0
4	8.0
5	6.0
6	11.0
7	13.0
8	14.0
9	10.0
10	8.0
Avg. Width (ft.) =	10.4

McNeil Core Sample

Date Processed: 12-Nov-98 **Total Dry Weight (g):** 3468

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	11	0	0
Fine Sand	0.250	19.5	1	1
Medium Sand	0.500	32	1	2
Coarse Sand	0.850	12	0	2
Vry Coarse Sand	1.0	94	3	5
Vry Fine Gravel	2.0	246.5	7	12
Fine Gravel	4.75	147	4	16
Fine Gravel	6.3	147.5	4	20
Medium Gravel	8.0	645.5	19	39
Coarse Gravel	16.0	1019.5	29	69
Vry Coarse Gravel	31.5	1086.5	31	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**3461**	**100**	

D_g =	11.7	% < 6.3mm	20
F_i =	7.3	% < 0.88mm	2

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	1	1	1
2-4	10	10	11
4-8	15	15	26
8-16	25	25	50
16-32	20	20	70
32-64	20	20	90
64-128	10	10	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	101		

30 Count Results

1	50	11	97	21	41
2	74	12	120	22	32
3	91	13	40	23	44
4	38	14	72	24	77
5	69	15	40	25	62
6	78	16	62	26	90
7	44	17	59	27	71
8	50	18	81	28	63
9	50	19	70	29	47
10	110	20	40	30	55

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981):
$D_g = D_1^{P_1} \times \ldots \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i;
P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	08/24/98	**Location :**	N.F. ALDER
Initials:		**Reach:**	1A
		Site Number:	2

Spawning Gravel Analysis

% Usable Spawning Area =	2.6		
Est. % Survival to Emergence:	31.3		
Redd Potential (#):	26	**Production Index:**	1658
Bankfull Area (ft^2):	1620.0	**Gravel Quantity (ft^2):**	41.6

	Bankfull Width
1	6.0
2	8.0
3	5.0
4	5.0
5	10.0
6	8.0
7	9.0
8	12.0
9	10.0
10	8.0
Avg. Width (ft.) =	8.1

McNeil Core Sample

Date Processed: 13-Nov-98 **Total Dry Weight (g):** 1798

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	3.5	0	0
Fine Sand	0.250	3	0	0
Medium Sand	0.500	6	0	1
Coarse Sand	0.850	4.5	0	1
Vry Coarse Sand	1.0	42	2	3
Vry Fine Gravel	2.0	142	8	11
Fine Gravel	4.75	70.5	4	15
Fine Gravel	6.3	75.5	4	19
Medium Gravel	8.0	330	18	38
Coarse Gravel	16.0	787	44	82
Vry Coarse Gravel	31.5	329	18	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**1793**	**100**	

D_g =	11.2	% < 6.3mm	19
F_i =	7.0	% < 0.88mm	1

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	10	10	10
2-4	10	10	20
4-8	25	25	45
8-16	20	20	65
16-32	25	25	90
32-64	10	10	100
64-128		0	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	72	11	31	21	52
2	50	12	40	22	51
3	99	13	78	23	60
4	84	14	49	24	68
5	29	15	59	25	77
6	30	16	77	26	30
7	47	17	110	27	48
8	88	18	86	28	70
9	100	19	40	29	30
10	66	20	44	30	49

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times \ldots \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	08/24/98	**Location :**	N.F.ALDER
Initials:		**Reach:**	1A
		Site Number:	3

Spawning Gravel Analysis

% Usable Spawning Area =	1.4		
Est. % Survival to Emergence:	29.4		
Redd Potential (#):	19	**Production Index:**	1137
Bankfull Area (ft^2):	2220.0	**Gravel Quantity (ft^2):**	30.4

	Bankfull Width
1	14.0
2	12.0
3	10.0
4	10.0
5	12.0
6	14.0
7	13.0
8	9.0
9	10.0
10	7.0
Avg. Width (ft.) =	11.1

McNeil Core Sample

Date Processed: 13-Nov-98 **Total Dry Weight (g):** 1573

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	2.5	0	0
Fine Sand	0.250	3	0	0
Medium Sand	0.500	5	0	1
Coarse Sand	0.850	3	0	1
Vry Coarse Sand	1.0	35	2	3
Vry Fine Gravel	2.0	153.5	10	13
Fine Gravel	4.75	89.5	6	19
Fine Gravel	6.3	79	5	24
Medium Gravel	8.0	294.5	19	43
Coarse Gravel	16.0	368.5	24	66
Vry Coarse Gravel	31.5	527.5	34	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**1561**	**100**	

D_g =	11.6	% < 6.3mm	24
F_i =	7.3	% < 0.88mm	1

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	18	18	18
2-4	20	20	38
4-8	20	20	58
8-16	20	20	78
16-32	15	15	93
32-64	7	7	100
64-128		0	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	46	11	65	21	74
2	72	12	60	22	62
3	101	13	51	23	90
4	80	14	50	24	81
5	67	15	70	25	64
6	60	16	94	26	48
7	49	17	38	27	41
8	58	18	40	28	52
9	34	19	29	29	57
10	38	20	70	30	30

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times \ldots \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve *i*; P_i = the proportion by weight of the entire sample made up of material retained on sieve *i*.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	08/21/98	**Location :**	N.F. ALDER
Initials:	GL GA	**Reach:**	4A
		Site Number:	1

Spawning Gravel Analysis

% Usable Spawning Area =	3.0		
Est. % Survival to Emergence:	37.6		
Redd Potential (#):	30	**Production Index:**	2297
Bankfull Area (ft^2):	1600.0	**Gravel Quantity (ft^2):**	48.0

	Bankfull Width
1	5.0
2	6.0
3	8.0
4	7.0
5	4.0
6	14.0
7	10.0
8	12.0
9	4.0
10	5.0
Avg. Width (ft.) =	8

McNeil Core Sample

Date Processed: 13-Nov-98 **Total Dry Weight (g):** 2200

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	1	0	0
Fine Sand	0.250	1	0	0
Medium Sand	0.500	1	0	0
Coarse Sand	0.850	1	0	0
Vry Coarse Sand	1.0	4	0	0
Vry Fine Gravel	2.0	29	1	2
Fine Gravel	4.75	28.5	1	3
Fine Gravel	6.3	42	2	5
Medium Gravel	8.0	259	12	17
Coarse Gravel	16.0	602.5	27	44
Vry Coarse Gravel	31.5	909	41	86
Small Cobble	63.5	318	14	100
Total Weight (g)		**2196**	**100**	

D_g =	22.1	% < 6.3mm	5
F_i =	11.2	% < 0.88mm	0

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	10	10	10
2-4	10	10	20
4-8	15	15	35
8-16	15	15	50
16-32	18	18	68
32-64	15	15	83
64-128	15	15	98
128-256	2	2	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	61	11	50	21	20
2	90	12	39	22	65
3	71	13	41	23	81
4	55	14	59	24	110
5	62	15	72	25	52
6	80	16	93	26	66
7	49	17	102	27	49
8	71	18	40	28	81
9	100	19	35	29	54
10	120	20	29	30	30

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{[illegible]L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981):
$D_g = D_1^{P_1} \times ... \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve *i*;
P_i = the proportion by weight of the entire sample made up of material retained on sieve *i*.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected: 09/02/98 **Location :** BENEWAH

Initials: GL, GA **Reach:** 12 **Site Number:** 1

Spawning Gravel Analysis

% Usable Spawning Area = 1.5

Est. % Survival to Emergence: 31.2

Redd Potential (#): 30 **Production Index:** 1910

Bankfull Area (ft^2): 3200.0 **Gravel Quantity (ft^2):** 48.0

	Bankfull Width
1	27.0
2	24.0
3	14.0
4	12.0
5	18.0
6	20.0
7	12.0
8	11.0
9	10.0
10	12.0
Avg. Width (ft.) =	16

McNeil Core Sample

Date Processed: 02-Sep-98 **Total Dry Weight (g):** 2816.5

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	8.5	0	0
Fine Sand	0.250	21	1	1
Medium Sand	0.500	42	2	3
Coarse Sand	0.850	15.5	1	3
Vry Coarse Sand	1.0	132.5	5	8
Vry Fine Gravel	2.0	168	6	14
Fine Gravel	4.75	66	2	16
Fine Gravel	6.3	84	3	19
Medium Gravel	8.0	707.5	26	45
Coarse Gravel	16.0	762	28	73
Vry Coarse Gravel	31.5	753	27	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**2760**	**100**	

D_g = 10.5 **% < 6.3mm** 19

F_i = 3.7 **% < 0.88mm** 3

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	8	8	8
2-4	13	13	21
4-8	15	15	36
8-16	17	17	53
16-32	25	25	78
32-64	15	15	93
64-128	7	7	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100

Total 100

30 Count Results

1	32	11	52	21	104
2	64	12	12	22	112
3	200	13	18	23	15
4	164	14	25	24	94
5	12	15	16	25	99
6	29	16	13	26	86
7	30	17	14	27	74
8	42	18	18	28	75
9	63	19	29	29	26
10	75	20	78	30	29

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} x ....x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	08/20/98	**Location :**	S.E. BENEWAH
Initials:	JL,GL	**Reach:**	13A
		Site Number:	1

Spawning Gravel Analysis

% Usable Spawning Area =	2.1		
Est. % Survival to Emergence:	26.5		
Redd Potential (#):	29	**Production Index:**	1565
Bankfull Area (ft^2):	2160.0	**Gravel Quantity (ft^2):**	46.4

	Bankfull Width
1	14.0
2	10.0
3	12.0
4	18.0
5	9.0
6	8.0
7	6.0
8	12.0
9	13.0
10	6.0
Avg. Width (ft.) =	10.8

McNeil Core Sample

Date Processed: 20-Aug-98 **Total Dry Weight (g):** 4108

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	37.5	1	1
Fine Sand	0.250	127.5	3	4
Medium Sand	0.500	248	6	10
Coarse Sand	0.850	66.5	2	12
Vry Coarse Sand	1.0	258.5	6	18
Vry Fine Gravel	2.0	297.5	7	25
Fine Gravel	4.75	108.5	3	28
Fine Gravel	6.3	96	2	30
Medium Gravel	8.0	517.5	13	43
Coarse Gravel	16.0	999	24	67
Vry Coarse Gravel	31.5	933	23	90
Small Cobble	63.5	418.5	10	100
Total Weight (g)		**4108**	**100**	

D_g =	8.8	% < 6.3mm	30
F_i =	3.1	% < 0.88mm	12

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	1	1	1
2-4	7	7	8
4-8	16	16	24
8-16	20	20	44
16-32	25	25	69
32-64	20	20	89
64-128	10	10	99
128-256	1	1	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100

Total 100

30 Count Results

1	90	11	70	21	64
2	95	12	80	22	47
3	100	13	97	23	60
4	103	14	83	24	56
5	86	15	79	25	115
6	80	16	58	26	80
7	78	17	100	27	80
8	74	18	87	28	85
9	41	19	78	29	64
10	83	20	50	30	87

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.0079L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981):
$D_g = D_1^{P_1} x ... x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i;
P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	08/20/98	**Location :**	S.E. BENEWAH		
Initials:		**Reach:**	13A	**Site Number:**	3

Spawning Gravel Analysis

% Usable Spawning Area =	4.6		
Est. % Survival to Emergence:	21.5		
Redd Potential (#):	56	**Production Index:**	2449
Bankfull Area (ft^2):	1940.0	**Gravel Quantity (ft^2):**	89.6

	Bankfull Width
1	8.0
2	7.0
3	8.5
4	9.0
5	8.0
6	9.0
7	16.0
8	12.0
9	10.0
10	10.0
Avg. Width (ft.) =	9.7

McNeil Core Sample

Date Processed: 20-Aug-98 **Total Dry Weight (g):** 4313

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	65.5	1	1
Fine Sand	0.250	112	2	4
Medium Sand	0.500	125.5	3	7
Coarse Sand	0.850	40	1	8
Vry Coarse Sand	1.0	522	12	19
Vry Fine Gravel	2.0	520	11	31
Fine Gravel	4.75	250.5	6	36
Fine Gravel	6.3	226	5	41
Medium Gravel	8.0	885	20	61
Coarse Gravel	16.0	764	17	77
Vry Coarse Gravel	31.5	539.5	12	89
Small Cobble	63.5	483.5	11	100
Total Weight (g)		**4533**	**100**	

D_g =	6.7	**% < 6.3mm**	41
F_i =	2.4	**% < 0.88mm**	8

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	8	8	8
2-4	7	7	15
4-8	8	8	24
8-16	9	9	33
16-32	8	8	41
32-64	9	9	51
64-128	16	16	67
128-256	12	12	79
256-512	10	10	90
512-1024	10	10	100
1024-2048		0	100
2048-4096		0	100
Total	97		

30 Count Results

1	50	11	93	21	30
2	58	12	60	22	36
3	49	13	34	23	30
4	53	14	45	24	33
5	65	15	28	25	27
6	40	16	40	26	38
7	90	17	40	27	40
8	50	18	35	28	24
9	41	19	41	29	60
10	56	20	34	30	40

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times ... \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected: 08/25/98 **Location :** BENEWAH

Initials: GA,RA **Reach:** 14A **Site Number:** 1

Spawning Gravel Analysis

% Usable Spawning Area = 1.8

Est. % Survival to Emergence: 23.5

Redd Potential (#): 18 **Production Index:** 864

Bankfull Area (ft^2): 1640.0 **Gravel Quantity (ft^2):** 28.8

	Bankfull Width
1	5.0
2	7.0
3	10.0
4	13.0
5	9.0
6	5.0
7	5.0
8	8.0
9	8.0
10	12.0
Avg. Width (ft.) =	8.2

McNeil Core Sample

Date Processed: 13-Nov-98 **Total Dry Weight (g):** 3444

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	7.5	0	0
Fine Sand	0.250	18.5	1	1
Medium Sand	0.500	43	1	2
Coarse Sand	0.850	20	1	3
Vry Coarse Sand	1.0	136	4	7
Vry Fine Gravel	2.0	455	13	20
Fine Gravel	4.75	300	9	29
Fine Gravel	6.3	274.5	8	37
Medium Gravel	8.0	1470.5	43	80
Coarse Gravel	16.0	701.5	20	100
Vry Coarse Gravel	31.5	0	0	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**3426.5**	**100**	

D_g = 6.1 **% < 6.3mm** 37

F_i = 4.7 **% < 0.88mm** 3

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	0	0	0
2-4	11	11	11
4-8	14	14	25
8-16	21	21	46
16-32	26	26	72
32-64	20	20	92
64-128	4	4	96
128-256	4	4	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100

Total 100

30 Count Results

1	80	11	101	21	42
2	65	12	90	22	62
3	46	13	60	23	75
4	74	14	37	24	31
5	30	15	41	25	30
6	48	16	29	26	51
7	51	17	25	27	58
8	52	18	60	28	64
9	76	19	57	29	88
10	35	20	38	30	41

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00729L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} x ... x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve *i*; P_i = the proportion by weight of the entire sample made up of material retained on sieve *i*.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Analysis and Results

Date Collected: 08/25/98 **Location:** BENEWAH

Initials: GA, RA **Reach:** 14A **Site Number:** 2

Spawning Gravel Analysis

% Usable Spawning Area = 12.8

Est. % Survival to Emergence: 30.3

Redd Potential (#): 115 **Production Index:** 7107

Bankfull Area (ft^2): 1440.0 **Gravel Quantity (ft^2):** 184.0

	Bankfull Width
1	6.0
2	6.0
3	10.0
4	12.0
5	4.0
6	5.0
7	4.0
8	10.0
9	9.0
10	10.0
Avg. Width (ft.) =	7.2

McNeil Core Sample

Date Processed: 25-Aug-98 **Total Dry Weight (g):** 3353

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	2	0	0
Fine Sand	0.250	6.5	0	0
Medium Sand	0.500	15	0	1
Coarse Sand	0.850	7	0	1
Vry Coarse Sand	1.0	60.5	2	3
Vry Fine Gravel	2.0	245.5	7	10
Fine Gravel	4.75	178	5	15
Fine Gravel	6.3	208.5	6	22
Medium Gravel	8.0	890	27	48
Coarse Gravel	16.0	770.5	23	71
Vry Coarse Gravel	31.5	969.5	29	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**3353**	**100**	

D_g = 11.3 **% < 6.3mm** 22

F_i = 7.1 **% < 0.88mm** 1

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	18	18	18
2-4	27	27	45
4-8	26	26	71
8-16	22	22	93
16-32	7	7	100
32-64		0	100
64-128		0	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100

Total 100

30 Count Results

1	29	11	40	21	19
2	34	12	59	22	27
3	42	13	65	23	38
4	58	14	60	24	42
5	50	15	71	25	50
6	49	16	76	26	61
7	31	17	30	27	68
8	28	18	34	28	70
9	25	19	28	29	77
10	37	20	20	30	32

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} x \ldots x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected: 08/26/98 **Location :** BULL CREEK

Initials: RA JL **Reach:** R1 **Site Number:** S1

Spawning Gravel Analysis

% Usable Spawning Area = 1.1

Est. % Survival to Emergence: 38.7

Redd Potential (#): 12 **Production Index:** 947

Bankfull Area (ft^2): 1800.0 **Gravel Quantity (ft^2):** 19.2

	Bankfull Width
1	13.0
2	10.0
3	12.0
4	9.0
5	8.0
6	10.0
7	6.0
8	8.0
9	4.0
10	10.0
Avg. Width (ft.) =	9

McNeil Core Sample

Date Processed: 12-Nov-98 **Total Dry Weight (g):** 2649.5

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	0.5	0	0
Fine Sand	0.250	1	0	0
Medium Sand	0.500	1	0	0
Coarse Sand	0.850	0.5	0	0
Vry Coarse Sand	1.0	2	0	0
Vry Fine Gravel	2.0	48	2	2
Fine Gravel	4.75	1.5	0	2
Fine Gravel	6.3	6	0	2
Medium Gravel	8.0	91.5	3	6
Coarse Gravel	16.0	755	28	34
Vry Coarse Gravel	31.5	1774.5	66	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**2681.5**	**100**	

D_g = 23.4 **% < 6.3mm** 2

F_i = 16.6 **% < 0.88mm** 0

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	4	4	4
2-4	6	6	10
4-8	20	20	30
8-16	32	32	62
16-32	18	18	80
32-64	20	20	100
64-128		0	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	27	11	16	21	28
2	26	12	66	22	36
3	65	13	124	23	16
4	72	14	106	24	12
5	14	15	60	25	10
6	19	16	58	26	17
7	26	17	52	27	21
8	24	18	40	28	19
9	8	19	32	29	16
10	4	20	24	30	24

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981):
$D_g = D_1^{P_1} \times \ldots \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve *i*;
P_i = the proportion by weight of the entire sample made up of material retained on sieve *i*.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected: 08/26/98 **Location :** WHITETAIL

Initials: JL RA **Reach:** 2 **Site Number:** 2

Spawning Gravel Analysis

% Usable Spawning Area = 8.9

Est. % Survival to Emergence: 29.6

Redd Potential (#): 90 **Production Index:** 5439

Bankfull Area (ft^2): 1620.0 **Gravel Quantity (ft^2):** 144.0

	Bankfull Width
1	12.0
2	7.0
3	9.0
4	10.0
5	9.0
6	10.0
7	7.0
8	6.0
9	5.0
10	6.0
Avg. Width (ft.) =	8.1

McNeil Core Sample

Date Processed: 10-Nov-98 **Total Dry Weight (g):** 4514

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	10	0	0
Fine Sand	0.250	25	1	1
Medium Sand	0.500	62.5	1	2
Coarse Sand	0.850	33	1	3
Vry Coarse Sand	1.0	224.5	5	7
Vry Fine Gravel	2.0	435	9	16
Fine Gravel	4.75	185	4	20
Fine Gravel	6.3	165.5	3	23
Medium Gravel	8.0	618.5	13	36
Coarse Gravel	16.0	1319.5	27	62
Vry Coarse Gravel	31.5	1670	34	96
Small Cobble	63.5	193.5	4	100
Total Weight (g)		**4942**	**100**	

D_g = 12.0 **% < 6.3mm** 23

F_i = 7.6 **% < 0.88mm** 3

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	7	7	7
2-4	5	5	12
4-8	13	13	25
8-16	16	16	41
16-32	22	22	63
32-64	27	27	90
64-128	10	10	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100

Total 100

30 Count Results

1	150	11	14	21	72
2	121	12	26	22	80
3	46	13	13	23	66
4	43	14	35	24	145
5	35	15	7	25	203
6	10	16	6	26	26
7	2	17	7	27	30
8	105	18	14	28	32
9	84	19	21	29	4
10	300	20	24	30	16

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.0073SL}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times \ldots \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	08/26/98	**Location :**	WINDFALL
Initials:	RA JL	**Reach:**	2
		Site Number:	2

Spawning Gravel Analysis

% Usable Spawning Area = 5.1

Est. % Survival to Emergence: 36.9

Redd Potential (#): 68 **Production Index:** 5117

Bankfull Area (ft^2): 2140.0 **Gravel Quantity (ft^2):** 108.8

	Bankfull Width
1	11.0
2	12.0
3	14.0
4	10.0
5	10.0
6	9.0
7	8.0
8	12.0
9	11.0
10	10.0
Avg. Width (ft.) =	10.7

McNeil Core Sample

Date Processed: 10-Nov-98 **Total Dry Weight (g):** 4127

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	5.5	0	0
Fine Sand	0.250	7.5	0	0
Medium Sand	0.500	10	0	1
Coarse Sand	0.850	4	0	1
Vry Coarse Sand	1.0	43	1	2
Vry Fine Gravel	2.0	98.5	2	4
Fine Gravel	4.75	53	1	5
Fine Gravel	6.3	56	1	6
Medium Gravel	8.0	375.5	9	15
Coarse Gravel	16.0	1253.5	29	44
Vry Coarse Gravel	31.5	2430	56	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**4336.5**	**100**	

D_g = 19.4 **% < 6.3mm** 6

F_i = 13.8 **% < 0.88mm** 1

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	5	5	5
2-4	11	11	16
4-8	15	15	31
8-16	15	15	46
16-32	20	20	66
32-64	18	18	84
64-128	16	16	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	83	11	108	21	56
2	74	12	120	22	91
3	69	13	80	23	15
4	54	14	62	24	74
5	30	15	75	25	71
6	57	16	90	26	64
7	28	17	30	27	87
8	40	18	31	28	21
9	48	19	70	29	28
10	55	20	71	30	23

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times \ldots \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected: 08/25/98 **Location :** SCHOOL HOUSE

Initials: GA,RA **Reach:** R-2 **Site Number:** S-2

Spawning Gravel Analysis

% Usable Spawning Area = 5.7

Est. % Survival to Emergence: 28.4

Redd Potential (#): 70 **Production Index:** 4055

Bankfull Area (ft^2): 1980.0 **Gravel Quantity (ft^2):** 112.0

	Bankfull Width
1	9.0
2	12.0
3	15.0
4	8.0
5	7.0
6	10.0
7	14.0
8	10.0
9	8.0
10	6.0
Avg. Width (ft.) =	9.9

McNeil Core Sample

Date Processed: 03-Dec-98 **Total Dry Weight (g):** 2959.5

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	7.5	0	0
Fine Sand	0.250	17	1	1
Medium Sand	0.500	32	1	2
Coarse Sand	0.850	13	0	2
Vry Coarse Sand	1.0	95.5	3	6
Vry Fine Gravel	2.0	240.5	8	14
Fine Gravel	4.75	149	5	19
Fine Gravel	6.3	207.5	7	26
Medium Gravel	8.0	863.5	29	55
Coarse Gravel	16.0	1197.5	41	96
Vry Coarse Gravel	31.5	125	4	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**2948.5**	**100**	

D_g = 8.4 % < 6.3mm 26

F_i = 5.3 % < 0.88mm 2

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	7	7	7
2-4	23	23	30
4-8	19	19	49
8-16	22	22	71
16-32	16	16	87
32-64	12	12	99
64-128	1	1	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100

Total 100

30 Count Results

1	15	11	71	21	38
2	31	12	84	22	27
3	29	13	56	23	20
4	41	14	50	24	19
5	50	15	27	25	40
6	33	16	37	26	52
7	39	17	41	27	62
8	28	18	50	28	77
9	60	19	90	29	64
10	68	20	92	30	51

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times \ldots \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	08/28/98	**Location :**	EVANS		
Initials:	RA GL	**Reach:**	5	**Site Number:**	S2

Spawning Gravel Analysis

% Usable Spawning Area =	1.3		
Est. % Survival to Emergence:	30.6		
Redd Potential (#):	22	**Production Index:**	1374
Bankfull Area (ft^2):	2620.0	**Gravel Quantity (ft^2):**	35.2

	Bankfull Width
1	13.0
2	15.0
3	18.0
4	12.0
5	10.0
6	16.0
7	15.0
8	10.0
9	12.0
10	10.0
Avg. Width (ft.) =	13.1

McNeil Core Sample

Date Processed: 12-Nov-98 **Total Dry Weight (g):** 4899

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	3	0	0
Fine Sand	0.250	3.5	0	0
Medium Sand	0.500	5.5	0	0
Coarse Sand	0.850	4	0	0
Vry Coarse Sand	1.0	60	1	1
Vry Fine Gravel	2.0	416	8	9
Fine Gravel	4.75	294	5	15
Fine Gravel	6.3	337.5	6	21
Medium Gravel	8.0	1501.5	28	49
Coarse Gravel	16.0	1334.5	25	73
Vry Coarse Gravel	31.5	1428.5	27	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**5388**	**100**	

D_g =	11.4	% < 6.3mm	21
F_i =	7.1	% < 0.88mm	0

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	7	7	7
2-4	11	11	18
4-8	12	12	30
8-16	18	18	48
16-32	17	17	64
32-64	10	10	74
64-128	15	15	89
128-256	11	11	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	101		

30 Count Results

1	71	11	101	21	55
2	110	12	40	22	58
3	92	13	39	23	30
4	64	14	38	24	44
5	60	15	20	25	62
6	88	16	36	26	27
7	91	17	66	27	20
8	47	18	92	28	18
9	55	19	84	29	35
10	82	20	60	30	41

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout (E=82.63e[illegible]), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times ... \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected: 08/28/98 **Location :** EVANS

Initials: GA,GL **Reach:** R6 **Site Number:** S1

Spawning Gravel Analysis

% Usable Spawning Area = 2.6

Est. % Survival to Emergence: 31.8

Redd Potential (#): 42 **Production Index:** 2721

Bankfull Area (ft^2): 2540.0 **Gravel Quantity (ft^2):** 67.2

	Bankfull Width
1	14.0
2	17.0
3	17.0
4	12.0
5	8.0
6	8.0
7	10.0
8	14.0
9	15.0
10	12.0
Avg. Width (ft.) =	12.7

McNeil Core Sample

Date Processed: 11-Oct-98 **Total Dry Weight (g):** 4689

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	1	0	0
Fine Sand	0.250	2	0	0
Medium Sand	0.500	5.5	0	0
Coarse Sand	0.850	3	0	0
Vry Coarse Sand	1.0	43.5	1	1
Vry Fine Gravel	2.0	245.5	5	6
Fine Gravel	4.75	152.5	3	9
Fine Gravel	6.3	444.5	9	18
Medium Gravel	8.0	910.5	18	37
Coarse Gravel	16.0	1496	30	67
Vry Coarse Gravel	31.5	1620	33	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**4924**	**100**	

D_g = 13.6 **% < 6.3mm** 18

F_i = 8.5 **% < 0.88mm** 0

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	12	12	12
2-4	10	10	22
4-8	10	10	32
8-16	12	12	44
16-32	14	14	58
32-64	16	16	74
64-128	16	16	90
128-256	10	10	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100

Total 100

30 Count Results

1	86	11	64	21	61
2	151	12	79	22	67
3	73	13	93	23	83
4	62	14	57	24	88
5	77	15	63	25	54
6	101	16	99	26	61
7	83	17	49	27	75
8	61	18	62	28	80
9	95	19	53	29	59
10	90	20	78	30	70

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00755L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times ... \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	08/31/98	**Location :**	EVANS
Initials:	GA GL	**Reach:**	6
		Site Number:	S2

Spawning Gravel Analysis

% Usable Spawning Area =	2.1		
Est. % Survival to Emergence:	37.6		
Redd Potential (#):	26	**Production Index:**	1994
Bankfull Area (ft^2):	1940.0	**Gravel Quantity (ft^2):**	41.6

	Bankfull Width
1	14.0
2	10.0
3	12.0
4	12.0
5	9.0
6	8.0
7	10.0
8	7.0
9	8.0
10	7.0
Avg. Width (ft.) =	9.7

McNeil Core Sample

Date Processed: 09-Nov-98 **Total Dry Weight (g):** 3851

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	0.5	0	0
Fine Sand	0.250	1	0	0
Medium Sand	0.500	2	0	0
Coarse Sand	0.850	0.5	0	0
Vry Coarse Sand	1.0	10.5	0	0
Vry Fine Gravel	2.0	64.5	2	2
Fine Gravel	4.75	50.5	1	3
Fine Gravel	6.3	61.5	2	5
Medium Gravel	8.0	480	12	17
Coarse Gravel	16.0	536	13	30
Vry Coarse Gravel	31.5	1591	39	69
Small Cobble	63.5	1230	31	100
	Total Weight (g)	**4028**	**100**	

D_g =	27.2	% < 6.3mm	5
F_i =	13.7	% < 0.88mm	0

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	7	7	7
2-4	15	15	22
4-8	22	22	44
8-16	20	20	64
16-32	25	25	89
32-64	11	11	100
64-128		0	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	24	11	64	21	7
2	32	12	69	22	101
3	25	13	52	23	120
4	21	14	25	24	10
5	8	15	18	25	5
6	12	16	74	26	3
7	76	17	65	27	24
8	84	18	21	28	17
9	101	19	18	29	10
10	95	20	10	30	12

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times ... \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected: 08/31/98 **Location :** EVANS

Initials: RA JL **Reach:** 7 **Site Number:** 1

Spawning Gravel Analysis

% Usable Spawning Area = 2.7

Est. % Survival to Emergence: 34.9

Redd Potential (#): 29 **Production Index:** 2062

Bankfull Area (ft^2): 1720.0 **Gravel Quantity (ft^2):** 46.4

	Bankfull Width
1	10.0
2	10.0
3	12.0
4	9.0
5	8.0
6	10.0
7	7.0
8	7.0
9	7.0
10	6.0
Avg. Width (ft.) =	8.6

McNeil Core Sample

Date Processed: **Total Dry Weight (g):**

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	0.5	0	0
Fine Sand	0.250	2	0	0
Medium Sand	0.500	5	0	0
Coarse Sand	0.850	3.5	0	0
Vry Coarse Sand	1.0	39	1	1
Vry Fine Gravel	2.0	177	5	6
Fine Gravel	4.75	89.5	2	8
Fine Gravel	6.3	104	3	11
Medium Gravel	8.0	469.5	12	23
Coarse Gravel	16.0	812.5	21	45
Vry Coarse Gravel	31.5	1444	38	83
Small Cobble	63.5	644	17	100
Total Weight (g)		**3790.5**	**100**	

D_g = 19.9 **% < 6.3mm** 11

F_i = 10.0 **% < 0.88mm** 0

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	8	8	8
2-4	10	10	18
4-8	18	18	36
8-16	20	20	56
16-32	26	26	82
32-64	14	14	96
64-128	4	4	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100

Total 100

30 Count Results

1	31	11	102	21	62
2	26	12	120	22	60
3	104	13	98	23	96
4	10	14	96	24	8
5	28	15	18	25	4
6	36	16	20	26	16
7	34	17	26	27	24
8	67	18	34	28	26
9	70	19	73	29	68
10	66	20	80	30	3

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} x ....x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve *i*; P_i = the proportion by weight of the entire sample made up of material retained on sieve *i*.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	09/01/98	**Location :**	EVANS
Initials:	GA,RA	**Reach:**	R7
		Site Number:	S2

Spawning Gravel Analysis

% Usable Spawning Area =	4.7		
Est. % Survival to Emergence:	34.5		
Redd Potential (#):	37	**Production Index:**	2601
Bankfull Area (ft^2):	1260.0	**Gravel Quantity (ft^2):**	59.2

	Bankfull Width
1	6.0
2	8.0
3	6.0
4	10.0
5	9.0
6	5.0
7	5.0
8	4.0
9	4.0
10	6.0
Avg. Width (ft.) =	6.3

McNeil Core Sample

Date Processed: 09-Nov-98 **Total Dry Weight (g):** 2449

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	1	0	0
Fine Sand	0.250	2	0	0
Medium Sand	0.500	4	0	0
Coarse Sand	0.850	2.5	0	0
Vry Coarse Sand	1.0	20.5	1	1
Vry Fine Gravel	2.0	107	4	6
Fine Gravel	4.75	70	3	8
Fine Gravel	6.3	87.5	4	12
Medium Gravel	8.0	432	18	30
Coarse Gravel	16.0	787.5	32	62
Vry Coarse Gravel	31.5	936	38	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**2450**	**100**	

D_g =	15.1	% < 6.3mm	12
F_i =	10.7	% < 0.88mm	0

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	5	5	5
2-4	15	15	20
4-8	15	15	35
8-16	16	16	51
16-32	17	17	68
32-64	12	12	80
64-128	10	10	90
128-256	10	10	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	91	11	45	21	40
2	102	12	44	22	51
3	80	13	88	23	57
4	85	14	28	24	62
5	60	15	76	25	41
6	58	16	61	26	140
7	34	17	50	27	100
8	38	18	47	28	38
9	20	19	21	29	44
10	29	20	60	30	57

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} x ....x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	08/27/98	**Location :**	EVANS, East Fork
Initials:		**Reach:**	5A
		Site Number:	1

Spawning Gravel Analysis

% Usable Spawning Area = 3.9

Est. % Survival to Emergence: 14.7

Redd Potential (#):	45	**Production Index:**	1352
Bankfull Area (ft^2):	1860.0	**Gravel Quantity (ft^2):**	72.0

	Bankfull Width
1	11.0
2	10.0
3	10.0
4	12.0
5	11.0
6	10.0
7	7.0
8	8.0
9	8.0
10	6.0
Avg. Width (ft.) =	9.3

McNeil Core Sample

Date Processed: 10-Nov-98 **Total Dry Weight (g):** 3608

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	3.5	0	0
Fine Sand	0.250	8.5	0	0
Medium Sand	0.500	40	1	1
Coarse Sand	0.850	27.5	1	2
Vry Coarse Sand	1.0	298.5	8	11
Vry Fine Gravel	2.0	839	23	34
Fine Gravel	4.75	408	11	45
Fine Gravel	6.3	336.5	9	55
Medium Gravel	8.0	795	22	77
Coarse Gravel	16.0	460	13	90
Vry Coarse Gravel	31.5	367	10	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**3583.5**	**100**	

D_g =	5.3	% < 6.3mm	55
F_i =	2.7	% < 0.88mm	2

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	6	6	6
2-4	14	14	20
4-8	19	19	39
8-16	13	13	52
16-32	32	32	84
32-64	16	16	100
64-128		0	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100

Total 100

30 Count Results

1	19	11	26	21	66
2	62	12	38	22	91
3	11	13	36	23	85
4	70	14	34	24	98
5	90	15	36	25	17
6	120	16	18	26	10
7	140	17	96	27	8
8	105	18	80	28	26
9	92	19	70	29	58
10	17	20	75	30	69

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00795L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981):
$D_g = D_1^{P_1} x ....x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i;
P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected: 09/03/98 **Location :** EVANS, South Fork

Initials: JL RA **Reach:** 5B **Site Number:** 1

Spawning Gravel Analysis

% Usable Spawning Area = 6.3

Est. % Survival to Emergence: 30.2

Redd Potential (#): 61 **Production Index:** 3760

Bankfull Area (ft^2): 1560.0 **Gravel Quantity (ft^2):** 97.6

	Bankfull Width
1	8.0
2	10.0
3	12.0
4	7.0
5	5.0
6	7.0
7	10.0
8	6.0
9	8.0
10	5.0
Avg. Width (ft.) =	7.8

McNeil Core Sample

Date Processed: 09-Nov-98 **Total Dry Weight (g):** 3405.5

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	7.5	0	0
Fine Sand	0.250	16	0	1
Medium Sand	0.500	35.5	1	2
Coarse Sand	0.850	15.5	0	2
Vry Coarse Sand	1.0	138.5	4	6
Vry Fine Gravel	2.0	266	8	14
Fine Gravel	4.75	115	3	18
Fine Gravel	6.3	141	4	22
Medium Gravel	8.0	630	19	40
Coarse Gravel	16.0	1283.5	38	78
Vry Coarse Gravel	31.5	733.5	22	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**3382**	**100**	

D_g = 10.5 **% < 6.3mm** 22

F_i = 6.6 **% < 0.88mm** 2

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	3	3	3
2-4	6	6	9
4-8	6	6	15
8-16	14	14	29
16-32	26	26	55
32-64	27	27	82
64-128	15	15	97
128-256	3	3	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100

Total 100

30 Count Results

1	66	11	98	21	78
2	15	12	91	22	85
3	78	13	28	23	110
4	21	14	7	24	65
5	34	15	5	25	40
6	36	16	10	26	16
7	49	17	24	27	25
8	76	18	29	28	16
9	107	19	47	29	31
10	124	20	56	30	28

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} x \ldots x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve *i*; P_i = the proportion by weight of the entire sample made up of material retained on sieve *i*.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected: 08/27/98 **Location :** EVANS, South Fork

Initials: RA JL **Reach:** 6B **Site Number:** 1

Spawning Gravel Analysis

% Usable Spawning Area = 2.8

Est. % Survival to Emergence: 37.3

Redd Potential (#): 47 **Production Index:** 3578

Bankfull Area (ft^2): 2700.0 **Gravel Quantity (ft^2):** 75.2

	Bankfull Width
1	14.0
2	10.0
3	8.0
4	6.0
5	25.0
6	30.0
7	15.0
8	9.0
9	10.0
10	8.0
Avg. Width (ft.) =	13.5

McNeil Core Sample

Date Processed: 10-Nov-98 **Total Dry Weight (g):** 4070

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	1	0	0
Fine Sand	0.250	1	0	0
Medium Sand	0.500	1	0	0
Coarse Sand	0.850	0.5	0	0
Vry Coarse Sand	1.0	3.5	0	0
Vry Fine Gravel	2.0	31	1	1
Fine Gravel	4.75	51.5	1	2
Fine Gravel	6.3	125.5	3	5
Medium Gravel	8.0	977	25	30
Coarse Gravel	16.0	1549	39	69
Vry Coarse Gravel	31.5	1242	31	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**3983**	**100**	

D_g = 15.6 **% < 6.3mm** 5

F_i = 11.0 **% < 0.88mm** 0

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	0	0	0
2-4	0	0	0
4-8	0	0	0
8-16	0	0	0
16-32	0	0	0
32-64	0	0	0
64-128	0	0	0
128-256	0	0	0
256-512	0	0	0
512-1024	0	0	0
1024-2048	0	0	0
2048-4096	0	0	0
Total	0		

30 Count Results

1	86	11	40	21	88
2	111	12	35	22	61
3	107	13	44	23	39
4	90	14	16	24	40
5	64	15	12	25	49
6	29	16	13	26	12
7	32	17	94	27	7
8	36	18	51	28	4
9	48	19	46	29	9
10	45	20	49	30	16

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} x ... x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	09/09/98	**Location :**	LAKE
Initials:	RA JL	**Reach:**	8
		Site Number:	1

Spawning Gravel Analysis

% Usable Spawning Area =	9.5		
Est. % Survival to Emergence:	-7.4		
Redd Potential (#):	37	**Production Index:**	-558
Bankfull Area (ft^2):	620.0	**Gravel Quantity (ft^2):**	59.2

	Bankfull Width
1	2.0
2	3.0
3	3.0
4	2.0
5	4.0
6	3.0
7	5.0
8	4.0
9	3.0
10	2.0
Avg. Width (ft.) =	3.1

McNeil Core Sample

Date Processed: 09-Nov-98 **Total Dry Weight (g):** 2323.5

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	23.5	1	1
Fine Sand	0.250	112	5	6
Medium Sand	0.500	350	15	21
Coarse Sand	0.850	36	2	22
Vry Coarse Sand	1.0	273	12	34
Vry Fine Gravel	2.0	658	28	63
Fine Gravel	4.75	326	14	77
Fine Gravel	6.3	285	12	89
Medium Gravel	8.0	259.5	11	100
Coarse Gravel	16.0	0	0	100
Vry Coarse Gravel	31.5	0	0	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**2323**	**100**	

D_g =	2.0	% < 6.3mm	89
F_i =	0.8	% < 0.88mm	22

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	3	3	3
2-4	12	12	15
4-8	18	18	33
8-16	20	20	53
16-32	17	17	70
32-64	30	30	100
64-128		0	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	36	11	16	21	32
2	32	12	34	22	41
3	40	13	36	23	16
4	45	14	31	24	34
5	31	15	41	25	33
6	10	16	30	26	24
7	16	17	56	27	31
8	18	18	32	28	24
9	16	19	41	29	36
10	32	20	48	30	42

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times ... \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	09/04/98	**Location :**	LAKE		
Initials:	JL RA	**Reach:**	8	**Site Number:**	3

Spawning Gravel Analysis

% Usable Spawning Area =	1.2		
Est. % Survival to Emergence:	-21.6		
Redd Potential (#):	12	**Production Index:**	-530
Bankfull Area (ft^2):	1640.0	**Gravel Quantity (ft^2):**	19.2

	Bankfull Width
1	8.0
2	12.0
3	6.0
4	7.0
5	5.0
6	8.0
7	10.0
8	9.0
9	5.0
10	12.0
Avg. Width (ft.) =	8.2

McNeil Core Sample

Date Processed: 10-Nov-98 **Total Dry Weight (g):** 938.5

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	14.5	2	2
Fine Sand	0.250	62	7	8
Medium Sand	0.500	91	10	18
Coarse Sand	0.850	21.5	2	20
Vry Coarse Sand	1.0	172.5	18	39
Vry Fine Gravel	2.0	472	50	89
Fine Gravel	4.75	69.5	7	96
Fine Gravel	6.3	25.5	3	99
Medium Gravel	8.0	10	1	100
Coarse Gravel	16.0	0	0	100
Vry Coarse Gravel	31.5	0	0	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**938.5**	**100**	

D_g =	1.4	% < 6.3mm	99
F_i =	0.9	% < 0.88mm	20

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	8	8	8
2-4	21	21	29
4-8	31	31	60
8-16	30	30	90
16-32	10	10	100
32-64		0	100
64-128		0	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	3	11	14	21	8
2	4	12	8	22	6
3	7	13	10	23	13
4	12	14	24	24	20
5	4	15	25	25	27
6	16	16	17	26	31
7	24	17	11	27	20
8	32	18	9	28	14
9	18	19	5	29	5
10	12	20	3	30	4

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00725L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} x \ldots x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected: 09/08/98 **Location :** WF LAKE

Initials: JL GL **Reach:** 9B **Site Number:** S3

Spawning Gravel Analysis

% Usable Spawning Area = 6.2

Est. % Survival to Emergence: 26.4

Redd Potential (#): 52 **Production Index:** 2799

Bankfull Area (ft^2): 1340.0 **Gravel Quantity (ft^2):** 83.2

	Bankfull Width
1	12.0
2	7.0
3	3.0
4	8.0
5	8.0
6	5.0
7	6.0
8	8.0
9	7.0
10	3.0
Avg. Width (ft.) =	6.7

McNeil Core Sample

Date Processed: 09-Nov-98 **Total Dry Weight (g):** 2654

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	8.5	0	0
Fine Sand	0.250	42	2	2
Medium Sand	0.500	118.5	4	6
Coarse Sand	0.850	36	1	8
Vry Coarse Sand	1.0	155.5	6	13
Vry Fine Gravel	2.0	224.5	8	22
Fine Gravel	4.75	104	4	26
Fine Gravel	6.3	121.5	5	30
Medium Gravel	8.0	494.5	19	49
Coarse Gravel	16.0	1088.5	41	90
Vry Coarse Gravel	31.5	278.5	10	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**2672**	**100**	

D_g = 7.5 **% < 6.3mm** 30

F_i = 4.1 **% < 0.88mm** 8

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	12	12	12
2-4	15	15	27
4-8	16	16	43
8-16	22	22	65
16-32	30	30	95
32-64	5	5	100
64-128		0	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	56	11	34	21	7
2	61	12	39	22	8
3	45	13	46	23	25
4	44	14	48	24	28
5	12	15	49	25	46
6	14	16	66	26	66
7	67	17	91	27	72
8	58	18	18	28	59
9	26	19	10	29	60
10	28	20	8	30	41

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times \ldots \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	09/08/98	**Location :**	WF Lake		
Initials:	JL GL	**Reach:**	10B	**Site Number:**	S1

Spawning Gravel Analysis

% Usable Spawning Area =	4.0		
Est. % Survival to Emergence:	30.0		
Redd Potential (#):	40	**Production Index:**	2447
Bankfull Area (ft^2):	1600.0	**Gravel Quantity (ft^2):**	64.0

	Bankfull Width
1	13.0
2	9.0
3	8.0
4	15.0
5	6.0
6	5.0
7	6.0
8	5.0
9	7.0
10	5.0
Avg. Width (ft.) =	8

McNeil Core Sample

Date Processed: 09-Nov-98 **Total Dry Weight (g):** 2900.5

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	15	1	1
Fine Sand	0.250	39.5	1	2
Medium Sand	0.500	77	3	5
Coarse Sand	0.850	19.5	1	5
Vry Coarse Sand	1.0	110.5	4	9
Vry Fine Gravel	2.0	188	6	15
Fine Gravel	4.75	96.5	3	19
Fine Gravel	6.3	102.5	4	22
Medium Gravel	8.0	418	14	37
Coarse Gravel	16.0	1000	34	71
Vry Coarse Gravel	31.5	847	29	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**2913.5**	**100**	

D_g =	10.6	% < 6.3mm	22
F_i =	6.7	% < 0.88mm	5

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	2	2	2
2-4	6	6	8
4-8	5	5	13
8-16	22	22	35
16-32	25	25	60
32-64	31	31	91
64-128	9	9	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100		

30 Count Results

1	45	11	109	21	18
2	40	12	12	22	12
3	61	13	72	23	94
4	58	14	60	24	80
5	50	15	62	25	62
6	26	16	58	26	64
7	12	17	44	27	26
8	19	18	50	28	33
9	76	19	26	29	19
10	70	20	34	30	16

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{[illegible]}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times ... \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	09/02/98	**Location :**	BOZARD
Initials:	JL RA	**Reach:**	R1
		Site Number:	S1

Spawning Gravel Analysis

% Usable Spawning Area =	2.0		
Est. % Survival to Emergence:	28.5		
Redd Potential (#):	25	**Production Index:**	1454
Bankfull Area (ft^2):	2020.0	**Gravel Quantity (ft^2):**	40.0

	Bankfull Width
1	12.0
2	9.0
3	10.0
4	7.0
5	8.0
6	11.0
7	10.0
8	12.0
9	10.0
10	12.0
Avg. Width (ft.) =	10.1

McNeil Core Sample

Date Processed: 02-Sep-98 **Total Dry Weight (g):** 2567.5

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	6	0	0
Fine Sand	0.250	23	1	1
Medium Sand	0.500	65	3	4
Coarse Sand	0.850	17	1	4
Vry Coarse Sand	1.0	90	4	8
Vry Fine Gravel	2.0	183	7	15
Fine Gravel	4.75	142	6	20
Fine Gravel	6.3	132	5	26
Medium Gravel	8.0	411	16	42
Coarse Gravel	16.0	1036	40	82
Vry Coarse Gravel	31.5	464	18	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**2567**	**100**	

D_g =	9.7	% < 6.3mm	26
F_i =	6.1	% < 0.88mm	4

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	5	5	5
2-4	8	8	13
4-8	15	15	28
8-16	16	16	44
16-32	34	34	78
32-64	20	20	98
64-128	2	2	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	100	100	

30 Count Results

1	98	11	24	21	66
2	64	12	12	22	61
3	36	13	7	23	58
4	45	14	8	24	79
5	109	15	14	25	124
6	70	16	18	26	110
7	66	17	26	27	98
8	75	18	31	28	65
9	40	19	28	29	41
10	45	20	70	30	36

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981):
$D_g = D_1^{P_1} x \ldots x D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve *i*;
P_i = the proportion by weight of the entire sample made up of material retained on sieve *i*.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	09/01/98	**Location :**	BOZARD
Initials:	RA GA	**Reach:**	1
		Site Number:	3

Spawning Gravel Analysis

% Usable Spawning Area =	7.3		
Est. % Survival to Emergence:	30.9		
Redd Potential (#):	52	**Production Index:**	3277
Bankfull Area (ft^2):	1140.0	**Gravel Quantity (ft^2):**	83.2

	Bankfull Width
1	4.0
2	6.0
3	4.0
4	8.0
5	5.0
6	3.0
7	6.0
8	6.0
9	8.0
10	7.0
Avg. Width (ft.) =	5.7

McNeil Core Sample

Date Processed: 09-Nov-98 **Total Dry Weight (g):** 2129.5

Particle	**Diameter (mm)**	**Weight (grams)**	**%Total**	**%Cumm.**
Vry Fine Sand	0.125	4	0	0
Fine Sand	0.250	16.5	1	1
Medium Sand	0.500	34	2	3
Coarse Sand	0.850	11.5	1	3
Vry Coarse Sand	1.0	58	3	6
Vry Fine Gravel	2.0	128.5	6	13
Fine Gravel	4.75	76	4	16
Fine Gravel	6.3	78.5	4	20
Medium Gravel	8.0	312	15	36
Coarse Gravel	16.0	789.5	39	75
Vry Coarse Gravel	31.5	506.5	25	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**2015**	**100**	

D_g =	11.3	% < 6.3mm	20
F_i =	7.1	% < 0.88mm	3

Wolman Pebble Count

Size Range (mm)	**Item Count**	**%Total**	**%Cumm.**
0-2	9	10	10
2-4	7	8	18
4-8	15	17	34
8-16	16	18	52
16-32	18	20	72
32-64	15	17	89
64-128	10	11	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100
Total	90		

30 Count Results

1	40	11	66	21	28
2	37	12	78	22	40
3	29	13	85	23	62
4	31	14	64	24	80
5	49	15	51	25	65
6	55	16	40	26	35
7	52	17	42	27	41
8	71	18	31	28	40
9	79	19	20	29	24
10	64	20	22	30	24

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout ($E=82.63e^{0.00735L}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981): $D_g = D_1^{P_1} \times ... \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve i; P_i = the proportion by weight of the entire sample made up of material retained on sieve i.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Spawning Gravel Survey, 1998 - Results and Analysis

Date Collected:	09/03/98	**Location :**	BOZARD, East Fork
Initials:	RA JL	**Reach:**	1
		Site Number:	2

Spawning Gravel Analysis

% Usable Spawning Area = 6.5

Est. % Survival to Emergence: 30.3

Redd Potential (#): 89 **Production Index:** 5473

Bankfull Area (ft^2): 2200.0 **Gravel Quantity (ft^2):** 142.0

	Bankfull Width
1	10.0
2	8.0
3	6.0
4	8.0
5	15.0
6	24.0
7	12.0
8	10.0
9	8.0
10	9.0
Avg. Width (ft.) =	11

McNeil Core Sample

Date Processed: 10-Nov-98 **Total Dry Weight (g):** 2811.5

Particle	Diameter (mm)	Weight (grams)	%Total	%Cumm.
Vry Fine Sand	0.125	13	0	0
Fine Sand	0.250	59.5	2	3
Medium Sand	0.500	151.5	5	8
Coarse Sand	0.850	36.5	1	9
Vry Coarse Sand	1.0	122.5	4	14
Vry Fine Gravel	2.0	109	4	17
Fine Gravel	4.75	57	2	19
Fine Gravel	6.3	62.5	2	22
Medium Gravel	8.0	380.5	14	35
Coarse Gravel	16.0	1253.5	44	80
Vry Coarse Gravel	31.5	572	20	100
Small Cobble	63.5	0	0	100
Total Weight (g)		**2817.5**	**100**	

D_g = 9.4 **% < 6.3mm** 22

F_i = 5.9 **% < 0.88mm** 9

Wolman Pebble Count

Size Range (mm)	Item Count	%Total	%Cumm.
0-2	1	1	1
2-4	5	5	6
4-8	11	11	17
8-16	10	10	27
16-32	30	30	57
32-64	22	22	79
64-128	21	21	100
128-256		0	100
256-512		0	100
512-1024		0	100
1024-2048		0	100
2048-4096		0	100

Total 100

30 Count Results

1	46	11	40	21	58
2	121	12	5	22	50
3	17	13	4	23	36
4	24	14	29	24	47
5	26	15	36	25	48
6	24	16	31	26	65
7	10	17	29	27	34
8	18	18	74	28	39
9	16	19	81	29	6
10	96	20	86	30	12

* Estimated % survival to emergence was calculated using the equation published by Weaver and Fraley, 1993.

** Redd potential was determined by dividing area of suitable spawning gravel by average redd size (Thurow and King, 1994)

*** Production Index is an estimate of fry production calculated by multiplying redd potential by the estimated % survival to emergence and the calculated egg deposition (E) for the average sized female (310mm), using a length-fecundity relation for westslope cutthorat trout (E=82.63e$^{[illegible]}$), where L is fork length in millimeters (Downs and Shepard).

**** Geometric mean diameter (D_g) was calculated by a method of moments using the formula of Lotspeich and Everest (1981):
$D_g = D_1^{P_1} \times ... \times D_i^{P_i}$; where D_g = the meometric mean (mm); D_i = the mean diameter (mm) of material retained on sieve *i*;
P_i = the proportion by weight of the entire sample made up of material retained on sieve *i*.

***** The fredle index (F_i) was calculated using the formula: $F_i = D_g/S_o$; where S_o = a sorting coefficient

Appendix G

Cohort analysis of growth for cutthroat trout and brook trout in select tributaries of the Coeur d'Alene Reservation, 1998.

Mean back-calculated lengths at annulus formation by age class and cohort - 1998.

SPECIES

Cutthroat Trout **Age Class**

LOCATION	Cohort	**Number**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
ALDER	1996	3	77	112						
	1995	8	82	117	154					
	1994	5	86	127	165	203				
	1993	1	82	111	147	183	220			
ALDER Total		17	82	119	158	200	220			
BENEWAH	1996	17	45	104						
	1995	55	43	97	157					
	1994	24	41	95	151	208				
	1993	18	45	103	166	238	297			
	1992	24	40	98	163	224	281	340		
	1991	3	32	76	124	182	237	305	367	
BENEWAH Total		141	43	98	157	220	285	336	367	
EVANS	1996	1	38	92						
	1995	27	61	108	155					
	1994	15	64	112	161	209				
	1993	2	67	116	159	209	258			
EVANS Total		45	62	109	157	209	258			
LAKE	1997	1	43							
	1996	11	58	105						
	1995	98	61	110	156					
	1994	32	60	107	156	203				
	1993	14	61	116	162	212	261			
	1992	20	65	119	165	216	267	325		
	1991	16	61	104	158	206	256	304	350	
	1990	1	61	108	155	202	258	305	352	390
LAKE Total		193	61	110	158	208	262	315	350	390
Grand Total		396	56	106	157	213	272	324	352	390

Standard deviation of mean back-calculated lengths at annulus formation - 1998.

SPECIES

Cutthroat Trout **Age Class**

LOCATION	Cohort	**Number**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
ALDER	1996	3	2	4						
	1995	8	8	6	10					
	1994	5	4	11	8	11				
	1993	1	#####	#####	#####	#####	#####			
ALDER Total		17	7	9	11	13	#####			
BENEWAH	1996	17	8	12						
	1995	55	10	14	15					
	1994	24	9	15	12	18				
	1993	18	10	15	17	30	32			
	1992	24	7	13	16	22	21	22		
	1991	3	12	34	29	28	32	32	18	
BENEWAH Total		141	9	15	16	27	30	25	18	
EVANS	1996	1	#####	#####						
	1995	27	15	17	14					
	1994	15	15	16	18	18				
	1993	2	20	15	19	30	26			
EVANS Total		45	15	17	16	18	26			
LAKE	1997	1	#####							
	1996	11	11	18						
	1995	98	10	16	20					
	1994	32	7	11	14	14				
	1993	14	7	28	27	37	36			
	1992	20	9	13	17	19	35	31		
	1991	16	7	22	9	15	17	20	24	
	1990	1	#####	#####	#####	#####	#####	#####	#####	#####
LAKE Total		193	9	17	19	21	30	28	24	#####
Grand Total		396	15	17	17	24	32	28	23	#####

Mean back-calculated lengths at annulus formation by age class and cohort - 1998.

SPECIES

Brook Trout **Age Class**

LOCATION	Cohort	**Number**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
ALDER	1996	1	70	124						
	1995	36	71	107	145					
	1994	20	73	112	150	186				
	1993	3	74	122	170	207	239			
	1992	5	72	115	156	202	241	281		
	1991	1	76	108	150	182	225	267	299	
ALDER Total		66	72	110	148	191	238	279	299	
BENEWAH	1997	1	55							
	1996	6	79	105						
	1995	14	84	121	153					
	1994	7	84	114	144	172				
	1993	2	81	118	154	182	209			
BENEWAH Total		30	82	116	150	175	209			
Grand Total		96	75	112	149	187	233	279	299	

Standard deviation of mean back-calculated lengths at annulus formation - 1998.

SPECIES

Brook Trout **Age Class**

LOCATION	Cohort	**Number**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
ALDER	2	1	#####	#####						
	3	36	7	11	15					
	4	20	6	10	9	13				
	5	3	9	12	12	13	9			
	6	5	7	6	17	25	29	32		
	7	1	#####	#####	#####	#####	#####	#####	#####	
ALDER Total		66	7	11	15	17	22	29	#####	
BENEWAH	1	1	#####							
	2	6	6	7						
	3	14	8	16	24					
	4	7	5	8	10	11				
	5	2	8	18	28	36	44			
BENEWAH Total		30	9	14	20	17	44			
Grand Total		96	9	12	16	18	27	29	#####	