Conservation of Columbia Basin Fish

Hatcheries Appendix

A Publication of the Federal Caucus • December 1999

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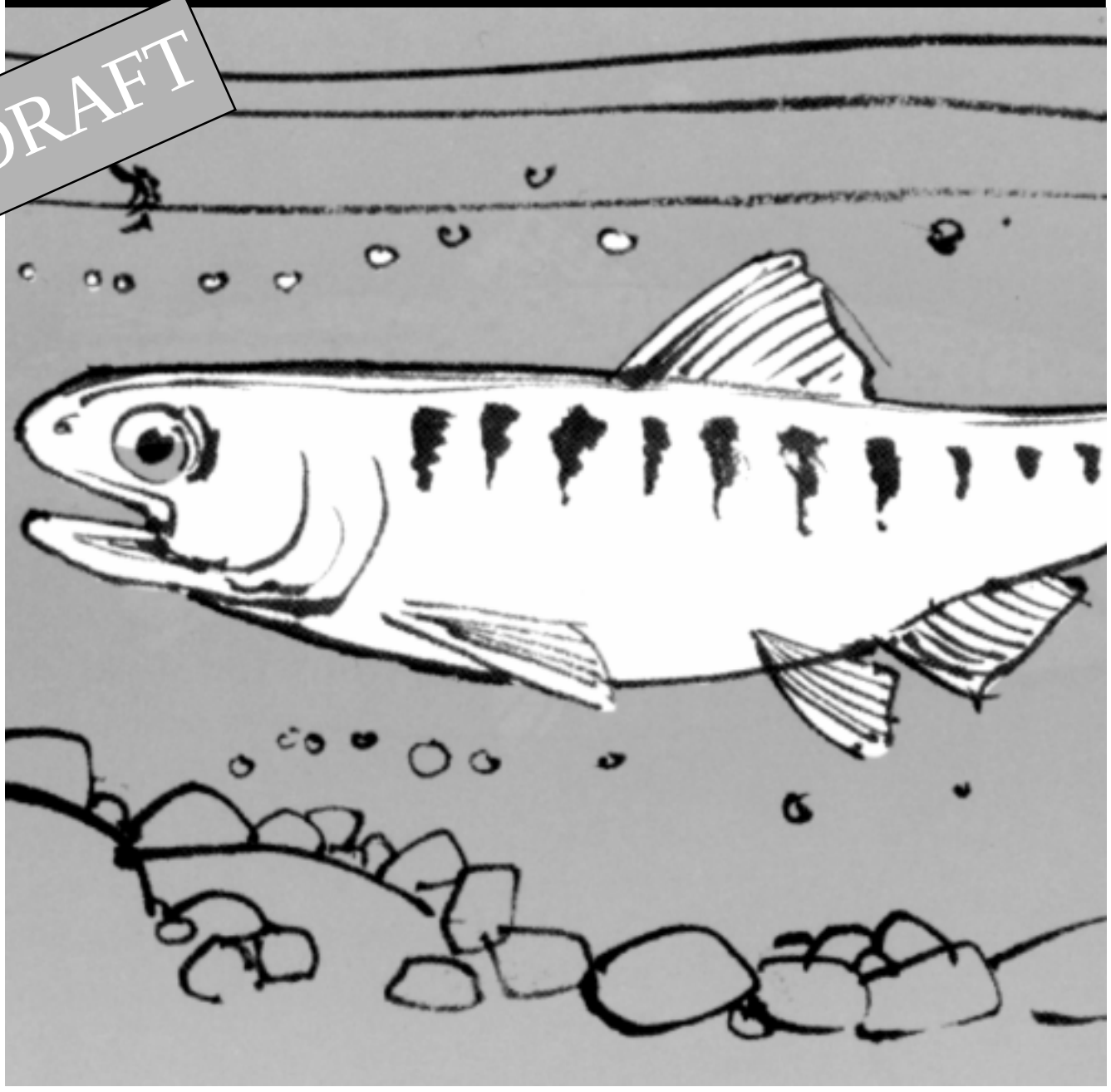

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Prepared by
The Federal Caucus

Army Corps of Engineers
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Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Environmental Protection Agency
Fish and Wildlife Service
Forest Service
National Marine Fisheries Service

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Insert maps of Columbia River Basin Anadromous Fish Propagation Facility Locations here

HATCHERY APPENDIX B

Artificial Production Programs in the Columbia River Basin

From Draft Artificial Production Review (NPPC November 1999)

This appendix contains a description of the major anadromous fish artificial production programs in the Columbia basin, not only the federally funded programs but also separate hatchery programs associated with FERC-licensed dams and state fish and wildlife agencies. Following the narrative description is a table listing the major programs and facilities and certain relevant information about these programs and facilities (Attachment 1).

Federal and non-federal artificial production programs in the Columbia River Basin

The program descriptions are compiled from a number of sources. Another recent (and relatively comprehensive) compilation of information about production programs and facilities in the basin is the recent Biological Opinion on artificial production in the Columbia basin produced by the National Marine Fisheries Service and the Biological Assessments produced by the various agencies in preparation for the Biological Opinion.

Federally funded anadromous fish production programs

Mitchell Act hatcheries. Twenty-five hatchery facilities funded by Congress under the Mitchell Act (also known as the Columbia River Fishery Development Program) are the heart of federally funded artificial production in the basin. Begun in the 1930s and 40s, and pursued ever since without a change in the basic legal authorization, the Mitchell Act called for the "conservation of the fishery resources of the Columbia River" through "one or more salmon cultural stations" and by other means. The majority of the funds spent under the Mitchell Act have been used to mitigate for the salmon and steelhead losses that occurred throughout the river by developing hatchery production in the lower Columbia. Mitchell Act facilities are largely concentrated in the lower Columbia below Bonneville Dam (16 facilities) or in the Bonneville Dam pool area (7 facilities). Two facilities are located in the mid-Columbia area upstream of the confluence with the Snake River. The National Marine Fisheries Service administers the Mitchell Act program, although the facilities are primarily managed and operated by cooperating agencies, primarily the Oregon Department of Fish and Wildlife, the Washington Department of Fish and Wildlife, and the U.S. Fish and Wildlife Service.

Releases from Mitchell Act facilities represent a large portion of all smolts released in the Columbia River Basin — estimated at one time to be approximately three-quarters of the total numbers produced and more than one-half of the total weight of all Columbia River Basin hatchery releases. The proportion of Mitchell Act releases to total basin releases is no longer quite that large, although Mitchell Act production is still far higher than all other programs — proposed release plans for 1999 show Mitchell Act releases of approximately 60 million anadromous juveniles out of a total of 142.5 million projected for the basin as a whole, or 42 percent. Of those 60 million juveniles, more than half will be fall chinook, with the rest spring chinook, coho, steelhead, chum and sea-run cutthroat trout. Release of 60 million represent a reduction over the last decade of Mitchell Act production, which once ranged as high as approximately 100 million juveniles per year. Cutbacks in Congressional appropriations have been largely responsible for the reduction in total production.

Production to preserve lower-river and ocean harvest opportunities has been the main focus of the Mitchell Act program, a source of bitterness to some of the lower river treaty tribes, whose usual and accustomed fishing sites lie above Bonneville Dam. The effort in the 1980s and 1990s to develop and fund new production programs above Bonneville Dam as part of the Council's Columbia River Basin fish and wildlife program has been, in large part, an effort on the part of the tribes and their state co-managers to address the fact that the Mitchell Act program provided mitigation in the lower river for impacts that affected people in the upper river as well. Also, as a result of production agreements negotiated as part of the *U.S. v. Oregon* harvest litigation and embodied in the Columbia River Fish Management Plan, the federal, state and tribal governments have cooperated in recent years in limited movements of Mitchell Act fish upriver for release, such as the release of fall chinook and coho from Mitchell Act facilities in the Yakima River.

Mitchell Act funding comes from congressional appropriations without reimbursement by Bonneville. Funding for some of the efforts to re-program Mitchell Act releases upriver have made their way into the fish and wildlife projects funded by Bonneville to implement the Council's fish and wildlife program. Mitchell Act facilities abandoned in recent years due to reductions in Congressional appropriations have also found their way into the Council's program, such as the adaptation of the Gnat Creek hatchery by the Oregon Department of Fish and Wildlife to produce fish for a terminal fisheries project in Young's Bay under the Council's program.

In the recent Biological Opinion issued by the National Marine Fisheries Service, the Fisheries Service concluded that hatchery operations in the lower river, including the operations of Mitchell Act facilities, are likely to jeopardize the continued existence of listed lower Columbia River steelhead. The Biological Opinion identified two main problems that led to this conclusion — releases of hatchery steelhead into natural production areas that result in predation and competition with listed steelhead juveniles and, especially, the continued use of non-endemic steelhead stocks in the production facilities in the lower river, which has the potential to affect listed steelhead through genetic introgression. The Fisheries Service identified a set of reasonable and prudent alternatives to avoid jeopardy (and additional conservation recommendations), focused primarily on transitions to locally-adapted stocks, an end to releases of non-endemic stocks, management of hatchery adult stray rates to less than 5 percent of the annual natural population size, and restrictions on the size of juvenile releases to minimize predation and competition.

At the same time the Fisheries Service issued the Biological Opinion, it also decided to add to the endangered species list lower Columbia chinook and upper Willamette spring chinook and steelhead. The Fisheries Service will thus have to revise its Biological Opinion on the production programs to take into account the effects on these newly listed fish.

For a more detailed discussion of current Mitchell Act production numbers and plans, see the *Biological Assessment for Mitchell Act Operations, 1999*, and *Mitchell Act Information Packet 1999*, prepared by the National Marine Fisheries Service, Columbia River Fisheries Development Program Office, Portland Oregon.

Grand Coulee mitigation — Leavenworth complex. The U.S. Bureau of Reclamation completed construction of Grand Coulee Dam in 1941, blocking the migration of salmon beyond that point on the mainstem of the Columbia River. In mitigation of the losses, the Bureau implemented a plan developed by the Washington fishery agency to trap adult salmon at Rock Island Dam on the mid-

Columbia and transport them to a hatchery constructed on the Wenatchee River at Leavenworth for artificial propagation, the smolts to be planted in the Wenatchee, Methow, Entiat and Okanogan rivers. The Entiat and Winthrop hatchery facilities, on the Entiat and Methow rivers, are satellite facilities of the Leavenworth Hatchery. The Fish and Wildlife Service operates the Leavenworth complex, funded through Bureau appropriations and reimbursed by Bonneville. Production plans in 1999 call for releases of more than 2 million spring chinook, as well as 100,000 summer steelhead from the Winthrop hatchery.

The Biological Opinion recently released by the National Marine Fisheries Service analyzed the effects of Leavenworth complex production on listed upper Columbia steelhead. Chinook and steelhead in the mid-Columbia region are now listed or proposed for listing.

John Day Dam mitigation. Congress authorized construction of the John Day Dam as part of the Flood Control Act of 1950. Construction and operation of the dam resulted in the loss of spawning grounds for what was then estimated as 30,000 adult fall chinook salmon. The Bonneville Fish Hatchery in Oregon has provided mitigation under a cooperative agreement between the Corps and the State of Oregon, and by the Spring Creek National Fish Hatchery in Washington. Bonneville Fish Hatchery was originally built in 1909 by the State of Oregon and has undergone major renovations funded by the Mitchell Act, John Day mitigation and the State of Oregon. The U.S. Army Corps of Engineers, under John Day mitigation, funds 45 percent of the operation and maintenance of the Bonneville Hatchery and the Mitchell Act funds 55 percent. The Spring Creek Hatchery, originally a Mitchell Act hatchery, also has been renovated and modernized. The Corps and the Mitchell Act each fund 50 percent of the operation and maintenance of the Spring Creek Hatchery.

Spring Creek Hatchery is a huge producer of fall chinook, with a production goal of 15 million tule fall chinook and 1999 projected releases of 10.7 million. The Bonneville Hatchery produces fall chinook, spring chinook, coho, and winter and summer steelhead for release locally and in other areas (e.g., fall chinook for the Umatilla River and steelhead for the Clackamas River program). The Bonneville facility is also used as part of the Grande Ronde River Endemic Spring Chinook Captive Broodstock Program, described briefly below.

Lower Snake River Compensation Plan. In the Water Resources Development Act of 1976, Congress authorized funding for a program to mitigate for fish and wildlife losses caused by construction and operation of the four lower Snake River hydroelectric projects (Lower Granite, Little Goose, Lower Monumental and Ice Harbor dams), known as the Lower Snake River Compensation Plan (LSRCP). The Corps of Engineers built ten hatcheries and sixteen satellite facilities for adult trapping and juvenile acclimation facilities between 1980 and 1998 on or for the lower Snake, Salmon, Clearwater, Walla Walla, Grande Ronde, Imnaha, Tucannon, Touchet and Walla Walla subbasins, at a cost over $170 million via Congressional appropriations later reimbursed by Bonneville. (Kooskia Hatchery on the Clearwater, which first began operations in 1969, is not technically part of the LSRCP, but it is operated by the Fish and Wildlife Service as a satellite of Dworshak Hatchery spring chinook production under the LSRCP.)

The U.S. Fish and Wildlife Service funds and administers the operation, maintenance and evaluation of LSRCP hatcheries and related facilities, using Congressional appropriations also reimbursed by Bonneville. Hatcheries and satellite facilities are operated by the Fish and Wildlife Service and by cooperating agencies, primarily the three state agencies, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, and Washington Department of Fish and Wildlife.

Three recently completed fall chinook facilities on the Snake and Clearwater rivers (Pittsburg Landing, Big Canyon, Capt. John's Rapids), although part of the LSRCP program, have operations and evaluation costs directly funded by Bonneville under the Council's fish and wildlife program. The Nez Perce Tribe in conjunction with the Washington Department of Fish and Wildlife operates all three facilities. The Confederated Tribes of the Umatilla Indian Reservation and Shoshone-Bannock Tribes also participate as cooperators in operation and management decisions, and all cooperators except the Shoshone-Bannock Tribes receive funds to conduct monitoring and evaluation studies.

The purpose of the LSRCP has been to replace lost salmon, steelhead and trout fishing opportunities, with management goals focused on replacing the loss of returning adult steelhead and salmon, rather than on releasing a given number of smolts. The adult return goals have been based on estimates of salmon and steelhead adult returns to the Snake River Basin in the years prior to the construction of the four lower Snake River dams — adult returns of 18,300 fall chinook, 58,700 spring and summer chinook, and 55,100 steelhead to and above the area of the dams. The production release goals for spring, summer and fall chinook and steelhead (as well as rainbow trout) are in the range of 10-15 million juveniles per year, although broodstock collection problems and other factors limit the ability to meet these goals. Production estimates for 1999 are closer to 10 million juveniles. No sockeye or coho are produced under the LSRCP authorizing legislation, even though these fish existed in the river and its tributaries prior to construction of the dams.

With the exception of fall chinook in the lower Snake River mainstem and steelhead in Idaho, production targets have been met. Meanwhile, naturally spawning salmon and steelhead runs in the Snake have declined to the point of endangered species listings. As an indication of the decline, one of the key issues for the LSRCP is whether these facilities can be transformed to be of use in supplementation efforts or even in conservation/captive propagation efforts while addressing productivity limitations.

In its recent Biological Opinion, the National Marine Fisheries Service concluded that hatchery operations in the Snake, including LSRCP operations, are not likely to jeopardize the continued existence of listed Snake spring/summer chinook, fall chinook or sockeye. The Fisheries Service did conclude, however, the production was likely to jeopardize the continued existence of listed Snake steelhead and lower Columbia River steelhead. The problems identified were the same as in the lower Columbia -- release strategies for hatchery steelhead that result in predation and competition with listed steelhead juveniles and, especially, the continued use of non-endemic steelhead stocks in the production facilities, which has the potential to affect listed steelhead through genetic introgression. The reasonable and prudent alternatives identified to avoid jeopardy were also similar (as were relevant conservation recommendations) — transitions to locally adapted stocks, an end to releases of non-endemic stocks, management of hatchery adult stray rates to less than 5 percent of the annual natural population size, restrictions on the size of juvenile releases and other strategies to minimize predation and competition. The same concerns about non-endemic stocks, stray rates and release strategies were present with regard to impacts on listed spring/summer and fall chinook, but the Fisheries Service concluded that recent developments to address these concerns made a jeopardy finding unnecessary.[1]

[1] For details on the status of the LSRCP program, see the publication of the papers from the *Lower Snake River Compensation Plan Status Review Symposium, 1998*, hosted by the Fish and Wildlife Service, and the *Independent Scientific Review Panel; Review of the BPA Reimbursable Account Programs in the Columbia River Basin, 1999.*

Dworshak Dam mitigation. Separate from the LSRCP is a production program to mitigate for steelhead and resident trout losses caused by the construction of Dworshak Dam, blocking the North Fork Clearwater River in Idaho. For this purpose, the Corps of Engineers funded the construction of the Dworshak National Fish Hatchery and the USFWS receives funds via the Corps to operate the facility, all reimbursed by Bonneville (the Dworshak hatchery also produces spring chinook as part of the LSRCP). The primary goal of fishery mitigation at Dworshak has been to preserve artificially the North Fork steelhead run, as the dam completely blocked the North Fork, a mitigation goal set at returning 20,000 adult steelhead to the Clearwater River. Production goals are to release approximately 1.2 million smolts at the hatchery and another 1.1 million in Clearwater tributaries. Adult steelhead returns to the hatchery have ranged from 1,988 to 43,942 since 1972, and the goal of 20,000 fish has been attained in eight of 25 years of operation. Dworshak steelhead operations were included in the Snake River steelhead production operations that the National Marine Fisheries Service concluded were likely to jeopardize continued existence of the listed Snake River steelhead. However, the Clearwater B-steelhead reared at the Dworshak hatchery is included in the steelhead ESU under ESA but are classified as non-essential for recovery. This classification is because of the North Fork Clearwater habitat of the B-steelhead is no longer available as a result of the construction of Dworshak Dam, and the hatchery has maintained an adequate number to maintain gene pool.

Warm Springs National Fish Hatchery. Authorized in 1966 and operational by 1978, the Warm Springs hatchery is located on the Warm Springs River in Oregon and funded and operated by the U.S. Fish and Wildlife Service. (This is one of the few federally funded anadromous production facilities in the basin outside of the Mitchell Act facilities that are not directly or by reimbursement funded by Bonneville.) The hatchery, projected in 1999 to release 750,000-spring chinook into the Warm Springs River, has suffered from an inadequate water supply and fish health problems.

Willamette River mitigation. Congress authorized the Corps of Engineers to build a number of dams on tributaries of the Willamette, blocking or causing serious damage to anadromous and resident fish runs. These include Cougar and Blue River dams on the McKenzie River, Detroit and Big Cliff dams on the North Santiam River, Green Peter and Foster Dams on the South Santiam, and Lookout Point and Dexter Dams on the Middle Fork of the Willamette. Anadromous fish mitigation is provided by the Leaburg, McKenzie, Marion Forks, South Santiam, and Willamette hatcheries, producing over 5 million spring chinook and steelhead smolts for release at various sites in the Willamette Basin. The Oregon Department of Fish and Wildlife operates the hatcheries under a cooperative agreement with the Corps, and the Corps provides a majority of the funding while the State of Oregon also provides a substantial portion of the funds. The Bonneville Power Administration reimburses the Corps funded portion.

The Biological Opinion recently released by the National Marine Fisheries Service did not implicate these Willamette mitigation hatcheries in the jeopardy conclusion on lower Columbia steelhead. However, the Fisheries Service just listed the wild spring chinook and steelhead runs in the Willamette, as well as lower Columbia chinook, and the Biological Opinion will have to be revised to analyze the effects of hatchery production in the Willamette on these runs.

Northwest Power Act/Council's fish and wildlife program. The most recent attempt to adapt artificial production techniques to the changing needs in the basin has been through the Council's fish and wildlife program. The Northwest Power Act requires the Council to develop a Columbia River Basin Fish and Wildlife Program consisting of measures to protect, mitigate and enhance fish and wildlife affected by the construction, operation and management of hydroelectric facilities in the basin.

The basin's tribes and state fish and wildlife agencies, often acting in various combinations of co-managers, have used the Council's fish and wildlife program to provide mitigation for hydropower effects in part by developing and obtaining funding for new artificial production programs in the subbasins above Bonneville Dam, to increase harvest opportunities and as part of an experimental attempt to supplement naturally spawning populations. The Council's fish and wildlife program conceives of this effort as a coordinated habitat restoration/production program in which artificial production efforts are supposed to be tied to habitat improvements. The purpose is to increase natural production capacity by introducing fish from the artificial production facilities. Bonneville funds all Council program projects. These efforts have included the following:

Hood River Production Project: The Hood River production project is a joint program of the Confederated Tribes of the Warm Springs Reservation of Oregon to rebuild spring chinook and steelhead populations in the Hood River through hatchery and acclimation facilities on that river and through use of production facilities already developed in the Deschutes River. Releases projected for 1999 include 125,000 spring chinook, 30,000 summer steelhead and 60,000 winter steelhead.

Yakima/Klickitat Fisheries Project: This is a Yakama Nation/Washington Department of Fish and Wildlife project whose main goal is to rebuild salmon runs in the Yakima River, which dropped from historic levels estimated as high as 900,000 adult fish per year to fewer than 5,000, as well as to increase populations in the Klickitat and other streams important to the Yakama Nation. The main focus has been the multi-million-dollar Cle Elum Supplementation and Research Facility and associated acclimation facilities, intended to be a large-scale test of spring chinook supplementation, with projected releases of spring chinook juveniles of up to 810,000. The National Marine Fisheries Service produced a Biological Opinion in 1996 on proposed 1997-2001 Cle Elum spring chinook operations. The Yakama Nation has also begun or is planning fall chinook and coho production in the Yakima, Klickitat and other streams, in part using fish from Mitchell Act hatcheries. Significant funding for habitat work in the Yakima associated with the supplementation effort has also come from the Council's program and other sources.

Umatilla Hatchery complex: Hatchery propagation in the Umatilla River is funded under the Council's fish and wildlife program as part of a coordinated habitat restoration/flow improvement/production effort to restore spring chinook, fall chinook, coho salmon and summer steelhead populations in the Umatilla subbasin. Salmon runs in the Umatilla have been gone since as far back as 1920, and the steelhead were at very low numbers when the program began. The Umatilla hatchery and six satellite facilities provide juvenile acclimation/release and adult holding/spawning. ODFW operates the hatchery, and the Confederated Tribes of the Umatilla Indian Reservation operate the satellite facilities. Additional facilities are proposed, including a juvenile coho and fall chinook acclimation/release facility, and a hatchery on the South Fork Walla Walla River that would, in part, produce spring chinook smolts for release at satellite facilities in the Umatilla subbasin. Projected production for 1999 includes 810,000 spring chinook, 3.162 million fall chinook, 1.5 million coho, and 150,000 steelhead.

Northeast Oregon Production Facilities, Grande Ronde and Imnaha subbasins: As part of what is called the Northeast Oregon Hatchery (NEOH) program, the Oregon Department of Fish and Wildlife, the Umatilla Tribes, and the Nez Perce Tribes have been planning and implementing supplementation programs for spring chinook and steelhead in the Grande Ronde and Imnaha subbasins, also the scene of Lower Snake River Compensation Plan production. The Grande Ronde spring chinook runs declined so severely that the Grande Ronde production initiative project has

transformed into a captive propagation effort -- facilities at the Bonneville Hatchery and elsewhere have been constructed or adapted so that spring chinook can be reared in captivity for later release into the Grand Ronde basin. The Grande Ronde has also been a Model Watershed under the Council's fish and wildlife program, the scene of significant funding for watershed planning and rehabilitation activities to accompany natural and artificial production efforts.

Northeast Oregon Production Facilities, Walla Walla River: Planning is under way to develop production and acclimation facilities to be used to help restore extirpated spring chinook and enhance the depressed steelhead populations in the Walla Walla, an effort led by the Umatilla Tribes, in conjunction with the Oregon Department of Fish and Wildlife and the Washington Department of Fish and Wildlife. The project in concept also includes stream habitat/watershed enhancement; structural fish passage improvement and enhanced instream flow.

Salmon River Supplementation: The Council's program funds a number of supplementation studies and activities by the Idaho Department of Fish and Game, the Nez Perce Tribe, the Shoshone-Bannock Tribes and the Fish and Wildlife Service to evaluate whether artificial production can be used to boost the rapidly declining, listed spring/summer chinook and steelhead populations in the Salmon basin. Most of the projects are small-scale research, monitoring and evaluation efforts. The supplementation efforts in the Salmon overlap with the LSRCP production, and as the LSRCP facilities and efforts begin to transform in part in the direction of supplementation and conservation, some of the LSRCP costs and activities are coming into the Council's program. And as in the Grande Ronde, in part the effort has transformed into a conservation/captive propagation program, in which spring chinook are or will be reared in captivity for later release into the Salmon basin. The Salmon is also the basin where, in the summer of 1991, the Shoshone-Bannock Tribes, Idaho Fish and Game, the National Marine Fisheries Service and others initiated an emergency captive broodstock program to try to prevent Snake River sockeye in Redfish Lake from extinction.

Nez Perce Tribal Hatchery/Clearwater River: The Council's fish and wildlife program calls for the Nez Perce Tribe to develop a number of small-scale production facilities under the umbrella of a single program for fall and spring chinook supplementation in the Clearwater River. The multi-million-dollar project is in the final design stage and is nearly ready for review and approval as to whether it will shift into construction and production. The Nez Perce Tribal Hatchery as planned will consist of two central incubation and rearing facilities, and six satellite rearing facilities. Maximum production goals are 768,000 spring chinook and nearly 3 million fall chinook juveniles, although initial production will be far below the maximum. The National Marine Fisheries Service completed a Biological Opinion in 1997 for Nez Perce Tribal Hatchery operations in 1998-2002. The Nez Perce Tribe is also working on a project to restore coho to the Clearwater, with initial funding provided by the Bureau of Indian Affairs for the release of approximately 1 million coho juveniles, taken from lower Columbia hatcheries and reared at existing facilities in the Clearwater. The Clearwater River has also been a focus watershed for habitat improvements under the Council's program which links habitat improvements to artificial production.

Select Area Fisheries Evaluations (SAFE): This is a terminal fisheries project in the lower Columbia River (Young's Bay and other sites) included in the Council's program, funded by Bonneville and operated by the Clatsop Economic Development Council and the Oregon Department of Fish and Wildlife to produce fall chinook, coho and spring chinook. Projected releases in 1999 total nearly 3 million juveniles. The National Marine Fisheries Service produced a Biological Opinion on the SAFE program in 1998.

Hatcheries associated with FERC-licensed hydropower projects

In addition to federally funded production programs, privately owned and public electric utilities produce millions more fish as mitigation for the impacts of their FERC-licensed dams. While these facilities are funded by the utilities, with minor exceptions state fish and wildlife agencies operate them all. A partial list includes production facilities funded by:

- Idaho Power Company (the Oxbow, Rapid River, Niagara Springs and Pahsimeroi hatchery complexes in the Snake and its Salmon River tributary, operated by the Idaho Department of Fish and Game and producing spring and fall chinook and steelhead, mitigating for the impact of Hells Canyon Complex);
- PacifiCorp (Lewis and Speelyai hatcheries produce spring chinook and coho salmon and the hatchery below Merwin Dam produces steelhead, sea-run cutthroat trout and rainbow trout, all to mitigate the impact of the dam. The hatcheries are operated by the Washington Department of Fish and Wildlife);
- Portland General Electric (helps fund production of spring chinook and steelhead at the Clackamas Hatchery in mitigation for the Little Sandy Dam and Clackamas River projects and spring chinook and steelhead at the Round Butte Hatchery in mitigation for the Round Butte and Pelton projects on the Deschutes River. The City of Portland, NMFS and State of Oregon also fund fish production at the Clackamas Hatchery.)
- Washington Water Power (helped to fund the Cabinet Gorge Kokanee Hatchery, producing kokanee for Lake Pend Oreille, and funds rainbow trout stocking in the Spokane River in mitigation for its Spokane project);
- Douglas County PUD (hatchery facility producing steelhead, spring chinook, and sockeye in the mid-Columbia region and in the Methow tributary, for Wells Dam mitigation);
- Chelan County PUD (hatchery production of coho, yearling chinook and steelhead as Rocky Reach Dam mitigation, and kokanee production as Lake Chelan project mitigation);
- Grant County PUD (Priest Rapids Hatchery and spawning channel production of fall chinook as mitigation for Priest Rapids and Wanapum dams);
- City of Portland (helps fund production of spring chinook and steelhead at the Clackamas Hatchery to mitigate for its Bull Run projects. PGE, NMFS and the State of Oregon. also fund the Clackamas Hatchery);
- Cowlitz County PUD (sharing the cost of some of the PacifiCorp production, as mitigation for a power plant it owns at the outlet of Swift Reservoir);
- Tacoma Public Utilities (funding hatchery producing spring and fall chinook, coho, steelhead, sea-run cutthroat trout and resident trout, in mitigation for Mayfield and Mossyrock dams on the lower Cowlitz River).

Because of the potential these programs have to adversely affect listed fish populations, the National Marine Fisheries Service analyzed them in its recent Biological Opinion (as part of the non-federal production activities by the state fish and wildlife agencies), implicated certain of these programs in the steelhead jeopardy findings, prescribed conditions on incidental take statements to protect listed steelhead and chinook populations, and suggested additional conservation recommendations.

Production facilities operated by state fish and wildlife agencies that are not federally financed or associated with FERC-licensed project mitigation

The state fish and wildlife agencies operate many of the federally financed production facilities, under all the programs (Mitchell Act, Lower Snake River Compensation Plan, Corps' mitigation hatcheries, Council's fish and wildlife program). They also operate most of the production facilities associated with FERC-licensed projects. But the state agencies also operate hatcheries in the basin that are not federally funded or linked to FERC-licensed projects, projects funded by the states themselves and developed primarily to address declining fisheries. As with the FERC-licensed hatcheries, because of the potential these programs have to adversely affect listed fish populations, the National Marine Fisheries Service analyzed them in its recent Biological Opinion, implicated some of these programs in the steelhead jeopardy findings, prescribed conditions on incidental take statements to protect steelhead and chinook populations, and suggested additional conservation recommendations.

Examples of these types of facilities and programs include three funded by the State of Oregon and operated by the Oregon Department of Fish and Wildlife:

- Roaring River Hatchery (producing summer steelhead for release into the North Santiam River);
- Oak Springs Hatchery (steelhead and resident trout production at a facility on the Deschutes River, producing various stocks for release in the Clackamas, Hood, Santiam, Sandy and other rivers — a hatchery implicated in the problems associated with the use of non-endemic steelhead stocks that pass into natural production areas and with the release of juvenile hatchery steelhead that compete with listed steelhead, but also in the forefront of steelhead production programs that are trying to match production stocks and techniques to naturally spawning populations in some areas);
- Clatsop Economic Development Council and other lower Columbia production (Oregon funds coho and fall chinook production activities for Young's Bay and other areas in the lower river to supplement the Mitchell Act and Bonneville-funded programs).

Attachment 1: Anadromous Salmonid Artificial Production Programs In the Columbia River Basin

Glossary of Table Data

CODE	NAME
IDFG	Idaho Fish and Game
USFWS	United States Fish and Wildlife Service
IPC	Idaho Power Company
BPA	Bonneville Power Administration
FH	Fish Hatchery
NMFS	National Marine Fisheries Service
COE	Corps of Engineers
BR	Bureau of Reclamation
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
NPT	Nez Perce Tribe
YIN	Yakama Indian Nation
NFH	National Fish Hatchery
SCTS	Salmon Culture Technology Center
ODFW	Oregon Department of Fish and Wildlife
STEP	Salmon and Trout Enhancement Program
CEDC	Clatsop Economic Development Council
PGE	Portland General Electric
LSRCP	Lower Snake River Compensation Plan
WDFW	Washington Department of Fish and Wildlife
MDFWP	Montana Department of Fish, Wildlife, and Parks
SBT	Shoshone Bannock Tribe
SPC	Shoshone Paiute
STOI	Spokane Tribe of Indians
CCT	Confederated Colville Tribes
PUD	Public Utility District
WWP	Washington Water Power
DJ	Dingle-Johnson
PPL	Pacific Power and Light
OMSI	Oregon Museum of Science and Industry
URB	Upriver Brights

Resident Species Codes

CODE	NAME
AG	Arctic Grayling
BG	Bluegill Sunfish
BLC	Bear Lake Cutthroat Trout
BR	Brown Trout
BRC	Bear River Cutthroat Trout
BT	Brook Trout
BUT	Bull Trout
CC	Channel Catfish
CT	Cutthroat Trout
GT	Golden Trout
KK	Kokanee Salmon
KT	Kamloops Trout
LB	Large Mouth Bass
LCT	Lahontan Cutthroat Trout
LT	Lake Trout
M	Mackinaw
RB	Rainbow Trout
RBT	Redband Trout
S	Splake
SRCT	Snake River Cutthroat Trout
TM	Tiger Muskellunge
W	Walleye
WCT	Westslope Cutthroat Trout
WSG	White Sturgeon
YCT	Yellowstone Cutthroat Trout

Idaho Department of Fish and Game

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
Clearwater FH (Clearwater)	IDFG	USFWS	Steelhead	Dworshak Natl. Fish Hatchery	Dworshak Natl. Fish Hatchery	Dworshak/ Clearwater FH	Clearwater FH	Clearwater River Drainage	
	IDFG	USFWS	Spring Chinook	Powell, Crooked River, Red River	Powell, Crooked River, Red River	Clearwater FH	Clearwater FH	Clearwater River Drainage	
Eagle FH (Boise)	IDFG	BPA	Sockeye	Redfish Lake Creek/Sawtooth FH	Sawtooth FH/Eagle FH	Eagle FH	Sawtooth FH/Eagle FH	Sawtooth Basin Lakes	Research Hatchery
	IDFG	BPA	Spring Chinook	Salmon River Tributaries	None (captive rearing only)	None (captive rearing only)	Eagle FH	Upper Salmon River Drainage	
Sawtooth FH (Salmon)	IDFG	USFWS	Spring Chinook	Sawtooth FH/East Fork Satellite	Sawtooth FH/East Fork Satellite	Sawtooth FH	Sawtooth FH	Salmon River Drainage	
	IDFG	USFWS	Steelhead	Sawtooth FH/East Fork Satellite	Sawtooth FH/East Fork Satellite	Sawtooth FH	Sawtooth FH	Salmon River Drainage	
	IDFG	USFWS	Steelhead	East Fork Satellite/Squaw Creek Pond	East Fork Satellite	Sawtooth FH	Sawtooth FH	East Fork Satellite/Squaw Creek Pond	
Magic Valley FH (Salmon)	IDFG	USFWS	Steelhead	Sawtooth FH/ Pahsimeroi FH	Sawtooth FH/ Pahsimeroi FH	Sawtooth FH	Magic Valley FH	Salmon River Drainage	
McCall FH (Payette)	IDFG	USFWS	Summer Chinook	South Fork Satellite	South Fork Satellite	McCall FH	McCall FH	South Fork Salmon River Drainage	
Pahsimeroi FH (Salmon)	IDFG	IPC	Steelhead	Pahsimeroi FH	Pahsimeroi FH	Sawtooth FH	Magic Valley FH/ Hagerman NFH	Salmon River Drainage	
			Summer Chinook	Pahsimeroi FH	Pahsimeroi FH	Sawtooth FH	Sawtooth FH/ Pahsimeroi FH	Pahsimeroi FH	
Niagara Springs FH (Salmon)	IDFG	IPC	Steelhead	Pahsimeroi FH	Pahsimeroi	Sawtooth FH	Niagara Springs FH	Salmon River Drainage	
Oxbow FH (Lower Snake Mainstem)	IDFG	IPC	Steelhead	Oxbow FH	Oxbow FH	Oxbow FH	Niagara Springs FH/ Magic Valley FH	Salmon River Drainage	
	IDFG	IPC	Spring Chinook	Oxbow FH	Oxbow FH/ Rapid River FH	Rapid River FH	Rapid River FH	Salmon River Drainage/ Clearwater Drainage	
Rapid River FH (Salmon)	IDFG	IPC	Spring Chinook	Rapid River FH	Rapid River FH	Rapid River FH/ Clearwater FH	Rapid River FH/ Clearwater FH	Salmon River, Snake River, Clearwater River Drainage	
	IDFG	IPC	Steelhead	Rapid River FH	None	None	None	Salmon River Drainage (adult releases)	

Oregon Department of Fish and Wildlife

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
Big Creek FH	ODFW	*NMFS*	Fall Chinook	Big Creek	Big Creek	Big Creek	Big Creek	Big Creek	Released at the hatchery
				Big Creek	Big Creek	Big Creek + STEP	STEP	Young's River	Transferred to STEP
				Big Creek	Big Creek	Big Creek + STEP	STEP	Clatskanie River, Scappoose Cr, Johnson Cr.	Transferred to STEP
				Big Creek	Big Creek	Various	Various	Young's Bay, Skipanon River	Transferred to high school programs
			Fall Chinook	Big Creek	Big Creek	CEDC	CEDC	Young's Bay	Transferred to CEDC
				Big Creek	Big Creek	Big Creek	Big Creek	Young's Bay	Transferred to CEDC Young's Bay Net Pens
				Big Creek	Big Creek	Big Creek	Big Creek + Klaskanine	Klaskanine River	Transferred to Klaskanine, 2 releases
			Coho	Big Creek	Big Creek	Big Creek	Big Creek	Big Creek	2 releases on Big Creek
				Big Creek	Big Creek	CEDC	CEDC	Klaskanine River	Transferred to CEDC
				Big Creek	Big Creek	Big Creek + Abernathy	Abernathy	-	Research facility, no documented releases
				Big Creek	Big Creek	Various	Various	Young's Bay, Skipanon River	Transferred to high school facilities
			Winter Steelhead	Big Creek	Big Creek	Big Creek	Big Creek	Big Creek, Sandy River	Released at the hatchery in Big Creek; direct release in the Sandy R.
				Big Creek	Big Creek	Big Creek + Bonneville	Bonneville	Transferred to Bonneville H.	Reared at Bonneville for Clackamas and Sandy Rivers
				Big Creek	Big Creek	Big Creek + STEP	STEP	Fertile Valley	Transferred to STEP
				Big Creek	Big Creek	Big Creek	Big Creek	Gnat Creek	Transferred to Gnat Creek Accl.

ODFW (Continued)

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
				Big Creek	Big Creek	Big Creek	Big Creek	Klaskanine River	Transferred to Klaskanine Accl.
Sandy	ODFW	*NMFS*	Coho	Sandy	Sandy	Sandy	Sandy	Sandy River	2 releases
				Sandy	Sandy	Sandy	Sandy	Young's Bay	Transferred to CEDC Young's Bay Net Pens
				Farady Dam/ Clackamas	Sandy	Sandy	Sandy	Clackamas River	Released above River Mill Dam
Bonneville	ODFW	*NMFS, COE*	Fall Chinook	Bonneville	Bonneville	Bonneville	Bonneville	Tanner Creek	2 releases
				Bonneville	Bonneville	Bonneville	Bonneville	Young's Bay	Transferred to CEDC Young's Bay Net Pens
				Bonneville	Bonneville	Bonneville	Bonneville	Umatilla	Transferred to Thornhollow, released in March
				Bonneville	Bonneville	Bonneville	Bonneville	Umatilla	Transferred to Thornhollow, released in April
				Bonneville	Bonneville	Bonneville	Bonneville	Columbia River, WA	Transferred to Ringold Acclimation - WDFW
				Bonneville	Bonneville	Bonneville	Bonneville	Klickitat River, WA	Transferred to Klickitat H. - WDFW
			Spring Chinook	Clackamas	Clackamas	Clackamas + Bonneville	Bonneville	Transferred to Clackamas H	Final Rearing at Clackamas H.
			Summer Steelhead	South Santiam	South Santiam	South Santiam + Bonneville	Bonneville	Clackamas River	Acclimated at Clackamas H.
			Winter Steelhead	Big Creek	Big Creek	Big Creek + Bonneville	Bonneville	Clackamas River	3 Releases, 3 acclimation sites
			Winter Steelhead	Big Creek	Big Creek	Big Creek + Bonneville	Bonneville	Sandy River	2 Releases, 2 acclimation sites
Cascade	ODFW	*NMFS*	Coho	Bonneville	Bonneville	Cascade	Cascade + Bonneville	Tanner Creek	Released at the hatchery

ODFW (Continued)

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
				Bonneville	Bonneville	Cascade	Cascade	Umatilla River	Transferred to New Accl. Site (RM 56)
				Bonneville	Bonneville	Cascade	Cascade	Yakima River	Transferred to YIN acclimation sites
Oxbow	ODFW	*NMFS*	Coho	Bonneville	Bonneville	Cascade	Upper Herman Creek	Tanner Creek	Acclimated at Bonneville H.
				Bonneville	Bonneville	Cascade	Upper Herman Creek	Young's Bay	Transferred to CEDC Young's Bay Net Pens
				Bonneville	Bonneville	Cascade	Lower Herman Cr. Ponds	Umatilla River	Transferred to New Accl. Site (RM 56)
				Bonneville	Bonneville	Cascade	Lower Herman Cr. Ponds	Young's Bay + Lower Columbia River	Transferred to CEDC Net Pens, Tongue Pt., Blind Sl., Young's Bay.
Eagle Creek NFH	USFWS	*NMFS*	Coho	Eagle Creek	Eagle Creek	Eagle Creek	Eagle Creek	Eagle Creek (Clackamas River)	Released at the hatchery
				Eagle Creek	Eagle Creek	Eagle Creek	Eagle Creek	Yakima River	Transferred to YIN acclimation sites
				Eagle Creek	Eagle Creek	Eagle Creek	Eagle Creek	Young's Bay	Transferred to CEDC Young's Bay Net Pens, 2 releases
			Winter Steelhead	Eagle Creek	Eagle Creek	Eagle Creek	Eagle Creek	Eagle Creek (Clackamas River)	Released at the hatchery
				Eagle Creek	Eagle Creek	Eagle Creek	Eagle Cr. + Clackamas H.	Clackamas River	Transferred to Clackamas H.
				Eagle Creek	Eagle Creek	Eagle Creek	Eagle Creek	Clackamas River	Transferred to Clackamette Cove Accl.
Clackamas	ODFW	*NMFS,* ODFW, City of Portland, PGE	Spring Chinook	Clackamas	Clackamas	Clackamas + Oxbow	Clackamas + Oxbow	Clackamas River	2 releases in the Clackamas River at the hatchery
				Clackamas	Clackamas	Clackamas + Willamette	Clackamas + Marion Forks	Clackamas River	Transferred to Cassidy Pond Acclimation

ODFW (Continued)

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
				Clackamas	Clackamas	Clackamas + Willamette	Clackamas + Marion Forks	Sandy River	Direct release
				Clackamas	Clackamas	Clackamas + Willamette	Clackamas + Marion Forks	Sandy River	Transferred to Marmot Accl.
				Clackamas	Clackamas	Clackamas + Oxbow	Clackamas + Bonneville	Clackamas	Released at the hatchery
				Clackamas	Clackamas	Clackamas + STEP		Clackamas River, Sandy River, Willamette River	Transferred to STEP
			Winter Steelhead	Farady Dam/Clackamas	Clackamas	Clackamas	Clackamas + Oak Springs	Clackamas River	Transferred to Oak Springs for final rearing
				Eagle Creek	Eagle Creek	Eagle Creek	Eagle Cr. + Clackamas H.	Clackamas River	Transferred in from Eagle Cr. NFH
Gnat Creek	ODFW	*BPA*	Spring Chinook	N/A	N/A	Gnat Creek	Gnat Creek	Columbia River, Young's Bay	Transferred to CEDC Net Pens, Tongue Pt., Blind Sl., Young's Bay.
Klaskanine	ODFW	*BPA*	Fall Chinook	Big Creek	Big Creek	Big Creek	Big Creek + Klaskanine	Klaskanine River	Released at the hatchery
Marion Forks	ODFW	ODFW/ COE	Spring Chinook	Minto Pond	Minto Pond	Marion Forks	Marion Forks	N. Fk. Santiam River	Direct Release
				Minto Pond	Minto Pond	Marion Forks	Marion Forks	N. Fk. Santiam River	Transferred to Minto Pond for Acclimation
Roaring River	ODFW	ODFW/ USFWS	Summer Steelhead	South Santiam	South Santiam	S. Santiam + Oak Springs	Oak Springs + S. Santiam	N. Fk. Santiam River	Transferred to Minto Pond for Acclimation
South Santiam	ODFW	ODFW/ COE	Spring Chinook	South Santiam	South Santiam	S. Santiam + STEP		Santiam River	Transferred to STEP
				South Santiam	South Santiam	S. Santiam + Willamette	Willamette + South Santiam	S. Fk. Santiam River	Transferred to Willamette, South Santiam, 2 releases
				South Santiam	South Santiam	S. Santiam + Willamette	Willamette + South Santiam	S. Fk. Santiam River	Transferred to Willamette, South Santiam, 2 releases

ODFW (Continued)

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
				South Santiam	South Santiam	S. Santiam + Willamette	Willamette	Mollala River	Transferred to Willamette, 2 releases
			Summer Steelhead	South Santiam	South Santiam	S. Santiam + Oak Springs	Oak Springs + S. Santiam	S. Fk. Santiam River	Released at the hatchery
				South Santiam	South Santiam	S. Santiam + Oak Springs	Oak Springs	Various programs	Transferred to Oak Springs, fulfills various other programs
				South Santiam	South Santiam	S. Santiam + Bonneville	S. Santiam + Bonneville	Clackamas River and Sandy River	Final Rearing at Bonneville H.
				South Santiam	South Santiam	S. Santiam + Oak Springs	Oak Springs + S. Santiam	N. Fk. Santiam River	Transferred to Minto Pond Accl.
McKenzie	ODFW	ODFW/ COE	Spring Chinook	McKenzie	McKenzie	McKenzie	McKenzie	Willamette River	2 direct releases in Willamette River
				McKenzie	McKenzie	McKenzie	McKenzie	Willamette River	Transferred to Multnomah Net Pens
				McKenzie	McKenzie	McKenzie	McKenzie	Clackamas River	2 direct releases in Clackamas River
				McKenzie	McKenzie	McKenzie	McKenzie	Clackamas River	Transferred to Clackamette Cove Net Pens
				McKenzie	McKenzie	McKenzie	McKenzie	McKenzie River	4 releases at the hatchery
				Mckenzie	McKenzie	McKenzie + Willamette	Willamette, Dex, McKenzie	McKenzie River	Transferred to Willamette, Dexter, McKenzie
				McKenzie	McKenzie	McKenzie + Willamette	Willamette	Willamette River	Transferred to OMSI Net Pens
				McKenzie	McKenzie	McKenzie + Willamette	Willamette	Willamette River	Direct release in Willamette River
Leaburg	ODFW	COE	Summer Steelhead	South Santiam	South Santiam	S. Santiam + Oak Springs	Oak Springs + Leaburg	McKenzie River	Released at the hatchery
				Leaburg	South Santiam	S. Santiam + Oak Springs	Oak Springs, Leaburg, Dex	M. Fk. Willamette River	Final Rearing and release at Dexter
Willamette	ODFW	ODFW/ COE	Spring Chinook	Dexter Ponds	Dexter Ponds	Willamette	Willamette	Lookout Pt. Res., Fall Creek	Fingerling releases

ODFW (Continued)

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
				Dexter Ponds	Dexter Ponds	STEP	Willamette + STEP	Willamette River	Transferred to STEP
				Dexter Ponds	Dexter Ponds	Gnat Creek	Tongue Pt. Net Pens	Columbia River	Transferred to Gnat Creek + CEDC
				Dexter Ponds	Dexter Ponds	Gnat Creek	Young's Bay	Columbia River	Transferred to Gnat Creek + CEDC
				Dexter Ponds	Dexter Ponds	Gnat Creek	Blind Slough	Columbia River	Transferred to Gnat Creek + CEDC
				Dexter Ponds	Dexter Ponds	Gnat Creek	Gnat Creek	Columbia River	Transferred to Gnat Creek + CEDC
				Dexter Ponds	Dexter Ponds	Willamette	Willamette + Dexter Pds.	M. Fk Willamette River	Transferred to Dexter Ponds, 3 releases
				Dexter Ponds	Dexter Ponds	Willamette	Willamette	M. Fk Willamette River	Direct release in Willamette River
			Summer Steelhead	Willamette	Willamette	Willamette	Willamette	Fall Creek	Direct Release
Oak Springs	ODFW	ODFW/ BPA	Summer Steelhead	South Santiam	South Santiam	S. Santiam + Oak Springs	Oak Springs	Sandy River, Hood River	Direct Release
				South Santiam	South Santiam	S. Santiam + Oak Springs	Oak Springs and others	Various	Transferred to Roaring R., S. Santiam, Leaburg hatcheries
				Powerdale Fish Facility	Powerdale Fish Facility	Oak Springs	Oak Springs	W. Fk. Hood River	Acclimated at Dry Run Bridge
			Winter Steelhead	Parkdale Tribal Hatchery	Parkdale Tribal Hatchery	Oak Springs	Oak Springs	M. Fk. and E. Fk.Hood River	Acclimated at Parkdale and E.Fk. Irrigation District Ponds
Round Butte	ODFW	PGE/BPA	Spring Chinook	Parkdale Tribal Hatchery	Parkdale Tribal Hatchery	Parkdale + Round Butte	Round Butte	M. Fk. Hood River	Acclimated at Parkdale
				Parkdale Tribal Hatchery	Parkdale Tribal Hatchery	Parkdale + Round Butte	Round Butte+Pelton Ladder	W. Fk. Hood River	Acclimated at Dry Run Bridge

ODFW (Continued)

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
				Pelton Ladder	Round Butte	Round Butte	Round Butte+Pelton Ladder	Deschutes River	Transferred to Pelton Ladder
			Summer Steelhead	Pelton Ladder	Round Butte	Round Butte	Round Butte	Deschutes River + Lake Simtustus	Direct Releases
				Pelton Ladder	Round Butte	Round Butte	Round Butte	Jefferson County Sports and Rec. Catchout	Transfer to Jefferson County Sports and Rec. Catchout
Umatilla	ODFW	BPA	Fall Chinook	Three Mile Dam	Three Mile Dam	Umatilla	Umatilla	Umatilla River	Acclimated at Thornhollow
			Spring Chinook	Three Mile Dam+Carson	S. Fk. Walla Walla+Carson NFH	Umatilla + Carson	Umatilla	Umatilla River	Acclimated at Imeques
			Summer Steelhead	Three Mile Dam	Minthorn Pond	Umatilla	Umatilla	Umatilla River	Acclimated at Bonifer and Minthorn ponds
Lookingglass	ODFW	LSRCP	Spring Chinook	Imnaha ponds	Lookingglass	Lookinglass	Lookingglass	Imnaha River	Acclimated at Imnaha Ponds
				Lookingglass+ Lookinglass Dam	Lookingglass	Lookingglass	Lookingglass	Lookingglass Creek	Released at the hatchery
				Upper Grand Ronde	Lookingglass	Lookingglass	Lookingglass	Upper Grand Ronde River	Acclimated at Upper Grand Ronde acclimation site
				Catherine Creek	Lookingglass	Lookingglass	Lookingglass	Catherine Creek	Acclimated at Catherine Creek site
				Lostine River	Lookingglass	Lookingglass	Lookingglass	Lostine River	Acclimated at Lostine River site
Wallowa Hatchery	ODFW	LSRCP	Summer Steelhead	Wallowa + Big Canyon	Wallowa	Wallowa + Irrigon	Irrigon	Wallowa River and Deer Creek	Acclimated at Wallowa and Big Canyon
			Summer Steelhead	Little Sheep Creek	Little Sheep Creek	Wallowa + Irrigon	Irrigon	Little Sheep Creek	Acclimated at Little Sheep Cr.

Washington Department of Fish and Wildlife

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
Beaver Creek (Elochoman)	WDFW	Mitchell Act	Searun Cutthroat	Beaver Creek	Beaver Creek	Beaver Creek	Beaver Creek	Beaver Creek	
			Winter Steelhead	Beaver Creek	Beaver Creek	Beaver Creek	Beaver Creek	Beaver Creek	
			Summer Steelhead	Beaver Creek	Beaver Creek	Beaver Creek	Beaver Creek	Beaver Creek/Gobar Ponds	
Chelan (Upper Mid. Col.)	WDFW	Chelan PUD	Summer Steelhead	Wells	Wells	Eastbank	Eastbank/Chelan/ Turtle Rock	Wenatchee River	
Cle Elum (Yakima)	YIN/ WDFW	BPA	Spring Chinook	Roza	Cle Elum	Cle Elum	Cle Elum	3 sites	
Cowlitz Salmon (Cowlitz)	WDFW	Tacoma Public Utilities	Fall Chinook	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	
			Coho	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	
			Spring Chinook	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	
Cowlitz Trout (Cowlitz)	WDFW	Tacoma Public Utilities	Searun Cutthroat	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	
			Summer Steelhead	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	
			Winter Steelhead	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	Cowlitz River	
Eastbank (Upper Mid. Col.)	WDFW	Chelan PUD	Spring Chinook	Chiwawa Pond	Eastbank	Eastbank	Eastbank	Chiwawa	
			Summer Chinook	Wells	Wells	Wells	Eastbank	Similkameen/Carlton Ponds	
			Summer Chinook	Dryden Dam	Eastbank	Eastbank	Eastbank	Dryden Pond	
			Summer Steelhead	Dryden Dam/Wells	Eastbank/Wells	Eastbank/Wells	Eastbank/Turtle Rock	Wenatchee River	
			Sockeye	Tumwater Dam	Eastbank	Eastbank	Eastbank	Lake Wenatchee Net Pens	
Elochoman (Elochoman)	WDFW	Mitchell Act	Tule Fall Chinook	Elochoman	Elochoman	Elochoman	Elochoman	Elochoman	
			Coho	Elochoman	Elochoman	Elochoman	Elochoman	Elochoman/ Deep River Net Pens	formerly part of Kalama Falls program
Fallert Creek (Kalama)	WDFW	Mitchell Act	Spring Chinook	Kalama Falls	Kalama Falls	Kalama Falls	Fallert Creek	Fallert Creek	

WDFW (Continued)

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
		WA State	Coho	Fallert Creek	Fallert Creek	Fallert Creek	Fallert Creek	Fallert Creek	
Grays River (Grays River)	WDFW	Mitchell Act	Summer Steelhead	Beaver Creek	Beaver Creek	Beaver Creek	Grays River	Gobar Pond/ Grays River/ other tribs	
			Coho	Grays River	Grays River	Grays River	Grays River	Deep River Net Pens	
Kalama Falls (Kalama)	WDFW	Mitchell Act	Fall Chinook	Kalama Falls	Kalama Falls	Kalama Falls	Kalama Falls	Kalama Falls	
			Spring Chinook	Kalama Falls	Kalama Falls	Kalama Falls	Fallert Creek	Fallert Creek	
			Coho	Kalama Falls	Kalama Falls	Kalama Falls	Kalama Falls	Kalama Falls	
			Summer Steelhead	Skamania	Skamania	Skamania	Beaver Creek	Fallert Creek	Development of local brood
			Summer Steelhead	Kalama River	Kalama Falls	Fallert Creek	Fallert Creek	Kalama System/ Fallert Creek	
			Winter Steelhead	Beaver Creek	Beaver Creek	Fallert Creek/ Beaver Creek	Beaver Creek	Gobar Pond	Development of local brood
			Winter Steelhead	Kalama River	Kalama Falls	Kalama Falls/ Beaver Creek	Fallert Creek	Fallert Creek	
Klickitat (Klickitat)	WDFW	Mitchell Act	Spring Chinook	Klickitat	Klickitat	Klickitat (Klickitat)	Klickitat	Klickitat	URB Marking: Elochoman, Washougal, Bonneville involved
			Fall Chinook	Priest Rapids	Priest Rapids	Priest Rapids/Klickitat	Klickitat	Klickitat	
			Coho	Lewis River	Lewis River	Lewis River/Klickitat	Klickitat	Klickitat	
Lewis River (Lewis)	WDFW	PacificCorp	Spring chinook	Lewis River/Merwin Dam	Speelyai	Speelyai	Speelyai/Lewis River	Lewis River	
		Mitchell Act	Coho	Lewis River/Merwin Dam	Lewis River	Lewis River	Lewis River	Lewis River	
Lyons Ferry (Lower Snake)	WDFW	LSRCP	Spring Chinook	Tucannon/Ringold	Lyons Ferry	Lyons Ferry	Lyons Ferry	Tucannon/Ringold	upriver=Pittsburg Landing, Captain Johns Rapids, Big Canyon

WDFW (Continued)

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
		Mitchell Act	Fall Chinook	Lyons Ferry/Lower Granite Dam	Lyons Ferry	Lyons Ferry	Lyons Ferry	Lyons Ferry/upriver sites (NPT)	
			Summer Steelhead	Lyons Ferry/Ringold	Lyons Ferry	Lyons Ferry	Lyons Ferry	Lyons Ferry/Ringold/other sites	
Merwin (Lewis)	WDFW	PacificCorp	Summer Steelhead	Merwin Dam	Merwin	Merwin	Merwin	Merwin	
Methow (Methow)	WDFW	Douglas PUD	Spring Chinook	Wells/trib trap sites	Methow	Methow	Methow	Methow/Chewuck/Twisp	
North Toutle (Cowlitz)	WDFW	Mitchell Act	Spring Chinook	Cowlitz Salmon	Cowlitz Salmon	Cowlitz Salmon	Cowlitz Salmon/North Toutle	North Toutle	
			Fall Chinook	North Toutle	North Toutle	North Toutle	North Toutle	North Toutle	
			Summer Steelhead	Skamania	Skamania	Skamania/Grays River	Grays River/North Toutle	North Toutle	
Priest Rapids (Upper Mid. Col.)	WDFW	Grant PUD	Fall Chinook	Priest Rapids	Priest Rapids	Priest Rapids	Priest Rapids	Priest Rapids	
Ringold Springs (Upper Mid. Col.)	WDFW	Mitchell Act	Spring Chinook	Ringold	Lyons Ferry	Lyons Ferry	Lyons Ferry/Ringold	Ringold	
			Fall Chinook	Bonneville/Priest Rapids	Bonneville/Priest Rapids	Bonneville	Bonneville	Ringold	
			Summer Steelhead	Wells	Wells	Lyons Ferry	Lyons Ferry/Ringold	Ringold	
Rocky Reach (Upper Mid. Col.)	WDFW	Chelan PUD	Summer Chinook	Wells	Wells	Wells	Rocky Reach	Turtle Rock	
			Summer Steelhead	Wells	Wells	Wells/Rocky Reach	Rocky Reach	Wenatchee R	
Skamania (Washougal)	WDFW	Mitchell Act	Summer Steelhead	Skamania	Skamania	Skamania	Skamania	Skamania	
			Winter Steelhead	Skamania	Skamania	Skamania	Skamania	Skamania	
			Cutthroat Trout	Skamania	Skamania	Skamania	Skamania	Skamania	
Speelyai (Lewis)	WDFW	PacifiCorp	Spring chinook	Lewis R./Merwin Dam	Speelyai	Speelyai	Speelyai	Lewis River	
		Mitchell Act	Coho	Lewis River	Lewis River	Speelyai	Speelyai	Upper Col. Tribs	part of captive brood program

WDFW (Continued)

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
Tucannon (Tucannon)	WDFW	LSRCP	Spring Chinook	Tucannon	Lyons Ferry	Lyons Ferry	Lyons Ferry	Lyons Ferry/Curl Lake	
			Summer Steelhead	Tucannon	Tucannon	Tucannon	Tucannon	Tucannon	
Turtle Rock (Upper Mid. Col.)	WDFW	Chelan PUD	Summer Steelhead	Tumwater Dam	Eastbank	Eastbank	Eastbank/Turtle Rock	Wenatchee	
			Summer Chinook	Wells	Wells	Wells/Eastbank	Turtle Rock	Turtle Rock	
Washougal (Washougal)	WDFW	Mitchell Act	Fall chinook	Washougal	Washougal	Washougal	Washougal	Washougal	
			Coho	Washougal	Washougal	Washougal	Washougal	Washougal/Klickitat	
Wells (Upper Mid. Col.)	WDFW	Douglas PUD	Summer Chinook	Wells	Wells	Wells	Wells	Wells	
			Summer Steelhead	Wells	Wells	Wells	Wells	Wells	

U.S. Fish and Wildlife Service

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
Abernathy SCTC (Lwr-Col Mainstem)	USFWS	USFWS	various	Abernathy SCTC	Abernathy SCTC	Abernathy SCTC	Abernathy SCTC	Abernathy SCTC, various sites according to research design	
Carson NFH (Wind)	USFWS	NMFS	Spring Chinook	Carson NFH	Carson NFH	Carson NFH	Carson NFH	Carson NFH (Wind River)	
	USFWS	NMFS	Spring Chinook	Carson NFH	Carson NFH	Carson NFH	Carson NFH	Umatilla River	Transferred to CTUIR
	USFWS	NMFS	Spring Chinook	Carson NFH	Carson NFH	Carson NFH	Big White Salmon Ponds	Big White Salmon Ponds	
Dworshak NFH (Clearwater)	USFWS	USFWS	Spring Chinook	Dworshak NFH	Dworshak NFH	Dworshak NFH	Dworshak NFH	Dworshak NFH (Clearwater River)	
	USFWS	COE	Steelhead	Dworshak NFH	Dworshak NFH	Dworshak NFH	Dworshak NFH	Dworshak NFH (Clearwater River), S.Fk. Clearwater R.	
Eagle Creek NFH (Willamette)	USFWS	NMFS	Coho	Eagle Creek NFH	Eagle Creek NFH	Eagle Creek NFH	Eagle Creek NFH	Eagle Creek NFH (Eagle Creek)	
	USFWS	NMFS	Coho	Eagle Creek NFH	Eagle Creek NFH	Eagle Creek NFH	Eagle Creek NFH	Yakima River	Transferred to YIN
	USFWS	NMFS	Coho	Eagle Creek NFH	Eagle Creek NFH	Eagle Creek NFH	Eagle Creek NFH	Young's Bay	Transferred to CEDC
	USFWS	NMFS	Steelhead	Eagle Creek NFH	Eagle Creek NFH	Eagle Creek NFH	Eagle Creek NFH	Eagle Creek NFH (Eagle Creek)	
Entiat NFH (Entiat)	USFWS	BR	Spring Chinook	Entiat NFH	Entiat NFH	Entiat NFH	Entiat NFH	Entiat NFH (Entiat River)	
Hagerman NFH (Salmon)	USFWS	USFWS	Steelhead	Sawtooth SFH	Sawtooth SFH	Hagerman NFH	Hagerman NFH	Sawtooth SFH (Salmon River), other Salmon R sites	
Kooskia NFH (Clearwater)	USFWS	USFWS	Spring Chinook	Kooskia NFH	Dworshak NFH	Kooskia NFH	Kooskia NFH	Kooskia NFH (Clear Creek, M.Fk. Clearwater River)	
Leavenworth NFH (Wenatchee)	USFWS	BR	Spring Chinook	Leavenworth NFH	Leavenworth NFH	Leavenworth NFH	Leavenworth NFH	Leavenworth NFH (Icicle Creek-Wenatchee River)	
Little White Salmon NFH (Lwr-Mid Col Mainstem)	USFWS	NMFS	Spring Chinook	Little White Salmon NFH	Little White Salmon NFH	Little White Salmon NFH	Little White Salmon NFH	Little White Salmon NFH (Little White Salmon River)	
	USFWS	NMFS	Spring Chinook	Umatilla River	Umatilla River	Little White Salmon NFH	Little White Salmon NFH	Umatilla River	Transferred to CTUIR
	USFWS	NMFS	Fall Chinook	Little White Salmon NFH	Little White Salmon NFH	Little White Salmon NFH	Little White Salmon NFH	Little White Salmon NFH (L.W. Salmon R)	

USFWS (Continued)

Hatchery	Agency	Funding Source	Species	Adult Collection Site	Adult Holding / Spawning	Incubation	Rearing	Acclimation / Release	Comments
	USFWS	NMFS	Fall Chinook	Little White Salmon NFH	Little White Salmon NFH	Little White Salmon NFH	Little White Salmon NFH	Yakima River	Transferred to YIN
Spring Creek NFH (Lwr-Mid Col Mainstem)	USFWS	NMFS, COE	Fall Chinook	Spring Creek NFH	Spring Creek NFH	Spring Creek NFH	Spring Creek NFH	Spring Creek NFH (mainstem Columbia River)	
Warm Springs NFH (Deschutes)	USFWS	USFWS	Spring Chinook	Warm Springs NFH	Warm Springs NFH	Warm Springs NFH	Warm Springs NFH	Warm Springs NFH (Warm Springs River-Deschutes R)	
Willard NFH (Lwr-Mid Col Mainstem)	USFWS	NMFS	Coho	Little White Salmon NFH	Little White Salmon NFH	Willard NFH	Willard NFH	Willard NFH (Little White Salmon River)	
	USFWS	NMFS	Coho	Little White Salmon NFH	Little White Salmon NFH	Willard NFH	Willard NFH	Clearwater River subbasin	Transferred to NPT
Winthrop NFH (Methow)	USFWS	BR	Spring Chinook	Wells Dam	Methow SFH	Winthrop NFH	Winthrop NFH	Winthrop NFH (Winthrop River)	
	USFWS	BR	Steelhead	Wells Dam	Wells SFH	Winthrop NFH	Winthrop NFH	Winthrop NFH (Winthrop River)	

HATCHERY APPENDIX C

Artificial Production: Purposes and Definitions

From Draft Artificial Production Review
Northwest Power Planning Council, November 1999

Artificial production is a tool used to address specific biological and management problems. To be able to evaluate whether to use the tool, and how effectively any particular use of the tool is, it is important to describe clearly the purpose of using artificial production, including the biological and management goals that it is intended to solve. The purpose of artificial production also guides the selection and application of production policies and the choice of performance standards. Thus it is necessary to describe the purposes first, and how the Council understands the purposes in the context of the broader ecosystem and management principles noted above, before describing the production policies.

Table 1 defines five purposes for artificial production, which are described further below. The purposes are based on scientific information summarized by the Scientific Review Team, the scientific focus of the Framework process, the experience and insights of the fishery managers, legislative and legal mandates, and the needs of the Council's Fish and Wildlife Program.

These purposes are described with respect to the *rationale* for using artificial production, a combination of the overarching social and legal *motivation* to do something about fish and wildlife, and the *biological problems* in the way of achieving the objective and that the use of artificial production will help surmount. The purposes are further described with respect to the *implications* of the decision to use artificial production to address the rationale, including a set of *assumptions* or conditions and duration for the use of the tool.

The *assumptions* and *duration* are a function of the biological problem. For example, a motivation for using artificial production might be to hasten rebuilding of a depleted fish population. For this decision to make sense biologically, it has to include the *assumption* that the natural habitat is largely intact or is being restored, and that the main biological problem is that natural productivity cannot rebuild the population fast enough to satisfy the social or legal motivation. In this case, the *duration* of the action should be temporary—the natural system should take over once production numbers increase and artificial production is no longer needed.

This logic implies a certain type of facility and an investment of limited duration, as well as certain policies and performance criteria. At the time artificial production is planned and initiated, and at periodic times after development, the managing entity should explicitly identify the proposed purpose of the facility, and then be able, based on evaluation data, to make the corresponding determinations of problem, assumptions or conditions, and duration.

Purposes of Artificial Production Programs Defined

AUGMENTATION:

An augmentation artificial production program provides fish for a specific reason, such as harvest, in numbers beyond the capability of the natural system. It operates within an intact natural system that is functioning at or near its natural capacity in the freshwater juvenile life stage, with excess capacity available at other life stages. It augments natural productivity to address a social motivation, such as the desire for harvest greater than the existing natural system can sustain.

Because the Columbia River Basin is heavily altered from its natural state, there are few examples of augmentation facilities in the basin. Examples can be found, however, in southeast Alaska, where artificial production programs augment the production from largely intact natural systems for harvest. Possible examples of augmentation programs in the Columbia River might include some resident fish hatcheries that are used to provide "put and take" fisheries in otherwise intact natural lake systems.

MITIGATION:

Artificial production programs are frequently used to mitigate for the loss or reduction of specific fish populations because of destruction or significant degradation of freshwater habitat by human activities. The artificial production is provided as compensation for the fish capacity lost to allow development of the habitat for other human uses. The loss of habitat to be mitigated is essentially permanent. Most artificial production programs in the Columbia River Basin fall into this category. (Mitigation production programs are sometimes referred to as compensation programs. This is usually done to avoid the term "mitigation," which is used in a confusing number of ways.)

For example, several salmon production programs in Idaho are intended as mitigation for blockage of the Snake River by Hells Canyon Dam. Similarly, the artificial production programs of the Lower Snake River Compensation Plan were constructed to compensate for the fish passage loss and reduction in quality of salmon habitat associated with construction and operation of Ice Harbor, Lower Monumental, Little Goose and Lower Granite dams. Some artificial production programs above blocked areas, such as Hells Canyon and Chief Joseph dams, mitigate for salmon losses with resident fish species. Production of resident native, and in some instances non-native, species that are adapted to the existing altered environment may be preferable to species that inhabited the basin before development.

In theory, a mitigation production program compresses the production potential of the lost habitat, for one or more life-stages of the population to be propagated, into the artificial habitat of one or more hatcheries. In anadromous and resident fish mitigation programs, the production from this habitat still must exist within the remainder of the natural ecosystem. For resident fish substitution programs[1], the habitat available must meet the needs of the substituted species of

[1] Polices and measures for resident fish substitution are in Sections 10.1 and 10.2 of the Council's Fish and Wildlife Program. The intent of this policy is to replace losses of anadromous fish in areas now permanently blocked to salmon and steelhead with resident species.

resident fish. The degree the artificial production program can compensate for lost habitat will depend in part on the quality of the habitat outside the hatchery in which the fish will spend the remainder of its lifecycle, and on the overall biological fitness of the propagated species in the habitat outside the hatchery.

RESTORATION:

Artificial production has been proposed as a means to speed or "jump-start" recovery of natural populations, especially in order to achieve a harvestable population size. A restoration program assumes a population is reduced or eliminated by habitat degradation or other effects (e.g. overharvest), but that the problem has or is being corrected and the existing biological system is now or will soon be capable of sustaining natural production. The motivation for the facility is that society does not wish to wait for natural productivity to rebuild the population. An extreme case of a restoration production program is where the natural population has been eliminated, and fish are reintroduced by artificial production when the problem causing the extirpation is removed. A restoration program is a temporary measure that will be withdrawn once the natural population is rebuilt or a determination is made that restoration is not possible.

For example, suppose chinook were eliminated from a watershed because irrigation withdrawals effectively dried up parts of the river in late summer. Action was then taken to reduce withdrawals and re-open the river to passage. With the native population eliminated, a restoration facility could be used to rear and release a compatible population that would be encouraged to return and spawn in the habitat. Over time the artificial production program would be phased out as the natural population rebuilt.

PRESERVATION/CONSERVATION:

In recent years, as numerous salmon and resident fish populations declined alarmingly, artificial production programs have been proposed to preserve the genetic resources of very small populations pending future rebuilding. This is recognized as an undesirable result of not identifying and addressing a situation with a population that should have been addressed at an earlier point in its decline with a less extreme approach for recovery. Populations that require preservation/ conservation face imminent demise or extirpation and, in most cases, are listed under the federal Endangered Species Act. In these situations, without immediate protection, the population will be extirpated, and the genetic resource lost. In certain situations, intervention in emergency situations may be desirable in the absence of a plan. In these situations, a plan for recovery must be developed and implemented immediately. Appendix 3 of the APR contains interim standards for captive propagation that should provide guidance for certain types of preservation and conservation activities.

A preservation production program, involving the use of techniques such as captive propagation and cryopreservation, is an emergency, temporary measure. A reasonable assumption is that the longer a population is reared in the captive environment, the less it will resemble the original naturally producing population in regard to genetics and behavior. Hence, the duration of the preservation/conservation purpose should be minimized. Therefore, it requires an explicit recovery plan with a compressed timeframe for return of the fish to the wild and an effective plan for dealing with the underlying habitat or management problem. Without such a plan, a preservation hatchery could become simply a museum to preserve fish with uncertain connections to the natural population structure, rather than a program of protective custody.

RESEARCH:[2]

What initially seemed like a rather straightforward application of engineering and animal husbandry has proven to be a thorny problem of melding technology with the natural biological system. The Scientific Review Team and other scientific observers continue to point to a wide range of biological uncertainties and problems associated with artificial production. This indicates the need for a concerted research program to investigate specific problems and an aggressive evaluation program to track progress and identify success and failure.

Because artificial production is an evolving technology, *all* artificial production programs have a research and evaluation function. Within an overall plan to evaluate and develop the technology, individual programs could be used experimentally. But it is not cost-effective or necessary to undertake research into the difficult and critical uncertainties at every facility. Instead, some facilities are designed specifically to carefully examine specific questions. The distinguishing feature of a research program is its operation within a strict experimental design. It likely has facilities to allow replication and testing. Importantly, a research facility should have an explicit mechanism to convey its results to the larger community so its techniques can be refined and replicated where effective.

COMBINATIONS OF PURPOSES/SHIFTS IN PURPOSE:

A hatchery facility or program may serve more than one purpose. A particular facility may contain more than one population and operate for a different purpose for the different populations. For example, the Bonneville hatchery now serves as a mitigation and a preservation facility for different populations.

A second situation is where a facility serves dual purposes for one population. For example, the Umatilla hatchery has a *restoration* function, intended to help re-seed the natural productive capacity of the Umatilla River, and a *mitigation* function, as mitigation for permanent habitat degradation in the Umatilla and mainstem Columbia. If so, the permanent *mitigation* aspect of the hatchery might continue, even as the temporary *restoration* aspect comes to an end, but with an appropriate shift in operations. In another example, the production program in the Grande Ronde River is combining aspects of restoration and preservation. It is legitimate for a hatchery to have a combination of purposes, but the multiple purposes need to be clearly identified and the implications addressed.

Because motivations and problems change over time, the purposes for artificial production will also change. The purpose of some existing hatcheries is now quite different from the purpose for which they were originally constructed. Production programs that were originally intended as mitigation for loss of habitat due to dam construction or other development, for example, are now being evaluated for their use as preservation/conservation facilities. As problems and motivations change during time, it is important to refine the purpose because policies and performance criteria for the facility will change accordingly. In a later section of this report, the Council recommends the re-evaluation of the purposes of each artificial production facility and program over the next three years.

[2] Among other things, the research purpose addresses SRT guideline number 3.

Table 1. Purposes of Artificial Production

	Rationale		Implications	
Purpose	**Biological Problem**	**Motivation**	**Duration**	**Assumption or Condition**
AUGMENTATION	Limited natural production capacity in freshwater; capacity of other habitat areas supports increased production	Increase harvestable numbers of fish	Permanent, but flexible if changes in harvest become desirable because of social, legal, or biological reasons	• Freshwater habitat is operating at capacity • Harvest, ocean capacity, mainstem habitat does not limit production, therefore, there is excess capacity in other life stages • Artificially produced population can coexist with and not jeopardize fitness of natural populations

Table 1. Purposes of Artificial Production (cont.)

	Rationale		Implications	
Purpose	**Biological Problem**	**Motivation**	**Duration**	**Assumption or Condition**
MITI-GATION	Habitat has been permanently blocked or altered by human activities resulting in a decline in survival and/or capacity, or elimination of the fish population	Replace or compensate lost habitat capacity of naturally produced fish with artificially produced fish (anadromous or resident) for harvest or some other reason. This includes: • 1) Artificial propagation to increase production of the affected resident or anadromous fish population • 2) Introduce or increase production of another anadromous fish species for the loss of anadromous fish or resident fish species for the loss of resident fish; and, • 3) Substitution of a resident fish species for the loss of anadromous fish in irrevocably blocked areas.	Permanent for the foreseeable future, but changes in the environment may make mitigation unnecessary	• No prospect for restoration of habitat that is being replaced by artificial production, at least not in other than long-term • Harvest, ocean capacity, mainstem habitat does not limit production, therefore, there is excess capacity in other life stages • Artificially produced population can coexist with and not jeopardize fitness of natural populations

Table 1. Purposes of Artificial Production (cont.)

	Rationale		Implications	
Purpose	**Biological Problem**	**Motivation**	**Duration**	**Assumption or Condition**
RESTORATION	Low or no natural production, but potential for increase or reintroduction exists because habitat capability is sufficient as it exists or due to restoration activities	Hasten rebuilding or reintroduction of a population to harvestable levels	Temporary (recognizes that duration may be long-term, but habitat will be or is adequate to support fish populations without artificial propagation.)	• Habitat is good or in the process of being restored as artificial production program is being implemented • Harvest, ocean capacity, mainstem habitat does not limit production, therefore, there is excess capacity in other life stages • Artificially produced population can coexist with and does not jeopardize fitness of target and other natural populations.

Table 1. Purposes of Artificial Production (cont.)

	Rationale		Implications	
Purpose	**Biological Problem**	**Motivation**	**Duration**	**Assumption or Condition**
PRESERVATION/ CONSERVATION	• Extremely low population abundance causes potential for extinction or losses of genetic diversity • Correctable habitat deterioration	Conserve genetic resources of fish populations impacted by habitat loss or degradation, including preservation of populations faced with imminent demise using methods such as captive propagation and cryopreservation.	Temporary (until causes of natural population decline are rectified)	• Genetic characteristics can be maintained via artificial propagation • Habitat problems will be corrected in the immediate or distant future
RESEARCH	Critical uncertainties from the other purposes, plus specific critical uncertainties with application of artificial propagation	How to effectively use artificial production to address the other motivations	Dependent on study design, objectives, and results	An explicit experimental design capable of providing usable answers to specific problems.

HATCHERY APPENDIX D

Artificial Production Review Report - Summary

Part I. Background

In late 1997, Congress asked the Northwest Power Planning NPPC (NPPC), with the assistance of the Independent Scientific Advisory Board, to review all federally funded artificial fish production programs in the Columbia River Basin and report to Congress with "a formal recommendation for a coordinated policy for the future operation of federally funded hatcheries." The Congress also asked for a recommendation for "how to obtain such a coordinated policy." This is a summary of the NPPC's draft report to Congress. The report has three parts:

- Part I describes the background for the Artificial Production Review.
- Part II contains the NPPC's recommendations for the policies that should guide the future operation of hatcheries in the basin, including a draft set of performance standards
- Part III contains the NPPC's recommendations for how to implement reform in artificial production programs consistent with the policies.

Following Congress' request, the NPPC initiated what it has called the Artificial Production Review (or APR). Part of the review involved the Independent Scientific Advisory Board (ISAB), as requested by the Senate Committee. With the help of the ISAB, the NPPC formed a Science Review Team (or SRT), consisting of four ISAB members, two outside experts in artificial production and one scientist from the NPPC staff. The NPPC then asked the Science Review Team to review the state of the science of artificial production. The SRT produced an initial report in December 1998 and then revised that into a final report for the NPPC in April 1999. The recommendations of the Science Review Team have been incorporated in the policies and standards discussed in Part II of the report.

Representatives of state and federal fish and wildlife agencies, the basin's Indian tribes, and non-governmental entities interested in artificial production worked on this report through an advisory committee formed by the NPPC -- the Production Review Committee. The purpose of this work through 1998 and into 1999 was to collect information on production programs in the basin and to develop and debate various approaches to production policy. The committee is also helping develop performance standards that can be used to evaluate hatcheries over time, as described in Part II. The NPPC held a public workshop in January 1999 to discuss production policy, several drafts of the report have been circulated for public review and comment, and a series of public meetings were held around the Basin in March and April of 1999.

Part II. Recommended Policies and Performance Standards to Guide Future Operation of Hatcheries in the Columbia River Basin

Congress asked the NPPC for "a formal recommendation for a coordinated policy for the future operation of federally funded hatcheries in the basin." Part II of the report provides that recommendation -- a set of policies and performance standards to guide decisions on the use and operation of hatcheries for specifically defined, based on the scientific principles of the Multi-species Framework.

A. Policies to Guide the Use of Artificial Production

1. **The manner of use and the value of artificial production must be considered in the context of the environment in which it will be used.**

2. **Artificial production must be implemented within an experimental, adaptive management design that includes an aggressive program to evaluate benefits and address scientific uncertainties.**

3. **Hatcheries must be operated in a manner that recognizes that they exist within ecological systems whose behavior is constrained by larger-scale basin, regional and global factors.**

4. **A diversity of life history types and species needs to be maintained in order to sustain a system of populations in the face of environmental variation.**

5. **Naturally selected populations should provide the model for successful artificially reared populations, in regard to population structure, mating protocol, behavior, growth, morphology, nutrient cycling, and other biological characteristics.**

6. **The entities authorizing or managing a hatchery facility or program should explicitly identify whether the artificial propagation product is intended for the purpose of augmentation, mitigation, restoration, preservation, research, or some combination of those purposes for each population of fish addressed:**

    - **Augmentation**: Increase harvestable numbers of fish
    - **Mitigation:** Replace or compensate lost habitat capacity of naturally produced fish with artificially produced fish
    - **Restoration**: Hasten rebuilding or reintroduction of a population to harvestable levels
    - **Preservation/Conservation:** Conserve genetic resources of fish populations impacted by habitat loss or degradation, including use of captive propagation and cryopreservation
    - **Research:** Determine how to effectively use artificial propagation to address the other hatchery purposes

7. **Decisions on the use of the artificial production tool need to be made in the context of deciding on fish and wildlife goals, objectives and strategies at the subbasin and province levels.**

8. **Appropriate risk management needs to be maintained in using the tool of artificial propagation.**

9. **Production for harvest is a legitimate management objective of artificial production, but to minimize adverse impacts on natural populations associated with harvest management of hatchery populations, harvest rates and practices must reflect or be dictated by the requirements to sustain naturally spawning populations.**

10. **Federal and other legal mandates and obligations for fish protection, mitigation, and enhancement must be fully addressed.**

B. Draft Performance Standards

Over the last few years, a number of agencies, inter-agency teams or scientific panels have developed partial or comprehensive sets of guidelines and standards to be used to evaluate artificial production. The guidelines in the Science Review Team's final report are but one example; the most comprehensive effort is the Integrated Hatchery Operations Team's (IHOT) *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries* from 1995. All of these efforts have been sensitive to the modern concerns for minimizing harm to natural populations. At the same time, it is possible that some of the standards developed even in the recent past are not consistent with the principles and policy statements that the NPPC recommends in this report.

For this reason, participants in the Artificial Production Review, working with NPPC staff and facilitators, organized an ad hoc work group to pull together a set of consistent performance standards that can be used to evaluate to hatchery operations in the future. Draft performance standards were developed by the work group, using the policies and purposes in this report, the guidelines in the Science Review Team's report, and the IHOT policies and performance standards as a foundation for these draft standards. The performance standards are still in draft form, as the NPPC intends to seek peer and public review before making a final recommendation.

Clearly, the true measure of the hatchery product, whether resident or anadromous, is to contribute adult fish not juveniles to the Tribal Treaty and non-treaty fisheries, and to optimize spawning ground escapement. Basically, the aim of the work group's evaluation system is to set up accountable, performance based management of hatchery programs to assure a focus on adults for harvest and viable population numbers on the spawning grounds.

In an effort to respond to the permitting and consultation needs of the Endangered Species Act (ESA), it is being proposed that the NPPC's Performance Standards and Indicators be incorporated into the hatchery and genetic management plans (HGMP) required by NMFS. The HGMP represents an opportunity to standardize the reporting of data for the ESA purposes and also to incorporate more comprehensive data useful to evaluate all anadromous or resident hatchery programs from specific hatcheries in the Columbia River Basin.

Aside from enumerating the Benefits and Risks and their respective performance standards and indicators, the Benefit and Risk Matrix (see below) attempts to preview how specific benefits and risks are unique and/or common to each hatchery purpose. This is an important insight because the level of risk is not equal across all hatchery purposes. However, critical research topics need to be initiated in order to scientifically evaluate the level of risk associated with specific hatchery programs within a given hatchery purpose. The approach recommended by the ad hoc work group requires conducting critical regional research studies by species at a specific hatchery within a subbasin and extrapolating the results to the rest of the region where appropriate.

Performance Standards related to Hatchery Benefits	Augmentation[a]	Mitigation[b]	Restoration[c]	Preservation/ Conservation[d]	Research[e]
1. Provide predictable, stable and increased opportunity for harvest.	✓	✓			
2. Achieve genetic and life history conservation.			✓	✓	
3. Enhance local, tribal, state, regional, and national economies.	✓	✓	✓	✓	
4. Fulfill legal/policy obligations.	✓	✓	✓	✓	
5. Contribution of fish carcasses to ecosystem function by subbasin and by hatchery.		✓	✓		
6. Provide fish to satisfy legally mandated harvest.	✓	✓	✓		
7. Will achieve within-hatchery performance standards.	✓	✓	✓	✓	
8. Restore and create viable naturally spawning populations.		✓	✓	✓	
9. Plan and provide fish with coordinated mainstem passage and habitat research in the Columbia Basin.					✓
10. Conduct within-hatchery research; improve performance or cost effectiveness of artificial production hatcheries to address the other four purposes.					✓
11. Minimize management, administrative, and overhead costs.					✓
I2. Improve performance indicators to better measure performance standards.					✓

a. Purpose is to increase harvestable numbers of fish.
b. Purpose is to replace or compensate lost habitat capacity of naturally producing fish with artificially produced fish (anadromous or resident, native and non-native) for harvest or some other reason.
c. Purpose is to hasten rebuilding or reintroduction of a population to harvestable levels.
d. Conserve genetic resources or fish populations impacted by habitat loss or degradation, including preservation of populations faced with imminent demise, using methods such as captive propagation and cryopreservation.

e. Determine how to effectively use artificial production to address the other hatchery purposes.

Performance Standards Related to Hatchery Risks	Augmentation	Mitigation	Restoration	Preservation/ Conservation	Research
1. Harvest management plan to protect weak populations where mixed population fisheries exist.	✓	✓	✓		
2. Do not exceed the carrying capacity of fluvial, lacustrine, estuarine, and ocean habitats.	✓	✓	✓	✓	✓
3. Assess detrimental genetic impacts among hatchery vs. wild where interaction exists.	✓	✓	✓	✓	✓
4. Unpredictable egg supply leading to poor programming of hatchery production.	✓	✓	✓	✓	
5. Production cost of program outweighs the benefit.	✓	✓	✓	✓	
6. Cost effectiveness of hatchery ranked lower than other actions in subregion or subbasin.	✓	✓	✓	✓	
7. Will not achieve within-hatchery performance standards.	✓	✓	✓	✓	
8. Evaluate habitat use and potential detrimental ecological interactions.	✓	✓	✓	✓	✓
9. Avoid disease transfer from hatchery to wild fish and vice versa.	✓	✓	✓	✓	
10. Evaluate impact on life history traits of wild and hatchery fish, from harvest and spawning escapement.	✓	✓	✓	✓	
11. Assess survival of captive broodstock progeny vs. wild cohorts.				✓	
12. Depleting existing population spawning in the wild through broodstock collection.			✓	✓	

Performance Indicators have been established for each Performance Standard. For example, these are the Performance Indicators for Performance Standard 3, "*Assess detrimental genetic impacts among hatchery vs. wild where interaction exists*," in the above table:

A. Initially, it is assumed that stray rate is a surrogate for a thorough and more complex measurement of genetic impact. More specific measurements to be implemented on a selected basis:
   1. Experimental design for evaluating genetic impact recommended by ISRP.
   2. Evaluated hatchery population against standard stray rate (<5% non-indigenous populations; <20% indigenous populations – NMFS standard)
   3. Measured introgression by comparing allele frequencies between hatchery and wild
   4. Implemented an appropriate experimental design to quantitatively measure outbreeding depression
   5. Conducted RM&E (research, monitoring, and evaluation) on selected basis at a specific hatchery and/or on selected species
   6. Experimental design for evaluating genetic impact recommended by ISRP.
B. Implemented HGMP where appropriate.
C. Relevant APR-SRT guidelines evaluated and implemented

Part III. Implementing Reform in Hatchery Policy and Practices

A. Six Implementation Recommendations

Six basic recommendations form the core of the NPPC's vision for implementation of the policies and standards for hatchery reform:

1. ***Evaluate the purposes for all artificial production facilities and programs in the basin within three years, applying the principles, policies and statement of purposes recommended above.***

2. ***Applying the policies and standards recommended in Part II, take the necessary steps to evaluate and then improve the operation of hatcheries that have an agreed-upon purpose.***

3. ***Use existing processes as much as possible to implement reform policies and standards.***

4. ***Ensure that the funding necessary to implement the reforms called for in this report is available.***

5. ***Form an ad hoc oversight team to oversee the implementation of hatchery reform consistent with the policies recommended in this report.***

6. ***Assess in five years success in using existing processes to implement reforms.***

The ultimate goal of the NPPC is to evaluate the purposes of artificial production in the context of agreeing-upon new subbasin plans. But interim evaluations of the purposes of existing facilities should not wait until the region completes the upcoming regional planning efforts (such as the completion of the Framework analysis and the amendment of the NPPC's fish and wildlife program) and initiates the subbasin planning process. Managers must use whatever existing processes they already face -- such as annual funding reviews -- to begin the re-evaluation of the purposes of their facilities. And until new subbasin assessments and plans are completed, managers and evaluators should rely on information already available or soon to be available, including:

- the scientific principles, policies and purposes in this report
- the template for Hatchery and Genetic Management Plans (currently under development)
- the province-level analysis from the Framework process (currently under development, and expected by the end of 1999)
- existing subbasin plans
- IHOT guidelines
- the Science Review Team's final report
- *U.S. v. Oregon* products and agreements

B. evaluating the purposes for all artificial production facilities and programs in the basin

<u>Recommendation:</u> Over the next three years, review and determine the purpose for every artificial production program and facility in the basin, federal and non-federal, consistent with the principles, purposes and policies described in Part II of this report. These evaluations should be a prerequisite for seeking continued funding or approvals in whatever funding and approval reviews that the facility or program faces in the next few years.

<u>Recommendation:</u> The NPPC expects that by sometime in 2000, the ultimate conclusion of various analytical, planning and decisionmaking processes in the region (e.g., the Multispecies Framework process, the NPPC's Fish and Wildlife Program amendment process, the federal agencies' ESA decisions, and Management Plan re-negotiations in U.S. v. Oregon) will be the initiation of a comprehensive subbasin planning process, guided by basin and province-level goals and objectives, overarching policies for artificial production based on the policies in this report, and criteria for subbasin planning. The purpose or purposes of all artificial production facilities must be re-evaluated in that subbasin planning effort, consistent with the policies in this report.

C. Applying the Policies and Performance Standards to Evaluate and Improve the Operation of Artificial Production Facilities

1. General recommendation -- immediately implement needed improvements in hatchery programs and facilities

Program managers and review bodies need to begin reviewing facilities immediately for consistency (or deficiencies) with the policies and performance standards described in this report, and developing plans to bring hatcheries up to standard. These reforms will require significant transition funding, the ability to reprogram resources and a commitment to a multi-year action program. During this transition period, the region will need an annual review of the progress, decisions, and actions necessary to achieve these reforms.

<u>Recommendation:</u> All facilities must be evaluated for consistency with the policies and standards in this report relating to hatchery operations. Evaluating the facility, developing a workplan to meet the standards, and showing progress toward meeting the standards should be a pre-requisite to obtaining continued funding (in whatever funding process the facility sits) or obtaining ESA approval for continued operations. Transition and re-programming funds need to be available (see Part IIID) to make this transition a reality.

The Council intends to use the funding reviews that it oversees (of the Bonneville direct fish and wildlife program and Bonneville's reimbursable programs, such as the Lower Snake River Compensation Plan facilities) as a vehicle for evaluating and

improving the operations of artificial production facilities measured by the standards in this report. Existing authorities not funded through Council programs will continue their own funding and management decisions, but there is much to recommend in a single review process, especially if it can become a "one-stop shop" for a scientifically credible review of facility operations in the context of review of other actions in the relevant subbasins. The Council is prepared to host such an effort, not as the ultimate decisionmaker, but as the body that is already planning to oversee rolling, in-depth reviews of production and other activities province-by-province and subbasin-by-subbasin throughout the basin, as part of how the Council is re-designing its funding review processes. Programs not already included in those reviews could integrate information about their facilities for review in the appropriate province review, and take back the review analysis as information for their funding decisions.

2. How to evaluate for consistency with policies and standards and identification of deficiencies; use of independent audits; independent scientific review

<u>Recommendation:</u> Agencies seeking funding for hatchery operations should analyze their operations against the policies and performance standards described in this report to identify deficiencies and needed improvements, making use of the existing audit information where appropriate. Use a combination of self-evaluations and independent evaluations, using scientific resources to focus on critical areas of uncertainty. The end result of this self-evaluation process should be a demonstration of consistency with the policies and standards or an explanation of inconsistencies and a proposal for correction. The evaluations and conclusions should then be presented to the review bodies, including independent scientific panels, for review as part of the funding processes. And, until the decisions on use and purpose are revisited as described in Part IIIB above, the proposals and decisions in the funding reviews should include an explicit if interim evaluation of the more fundamental questions about purpose, which would balance the magnitude of needed operational improvements against the potential for a change in purpose, as part of a judgment on funding priorities.

D. Establish transition fund and opportunities for reprogramming of funding

Funding this reform effort will be critical to reaching good informed decisions. The initial requirements will include funding the subbasin planning effort and funding for the initial modifications of facilities and programs necessary to comply with ESA biological opinions and the first round of requirements out of the funding reviews. Use of the HGMP's and existing processes will continue to determine the initial transitional needs until the sub-basin plans are completed. As the subbasin plans are completed they will define the future purposes for artificial production and any investments that are required to modify or improve the hatchery operations, any costs to close a facility, and whatever new programs will be undertaken in the subbasins.

In order to meet the needs of funding for reform activities, transition funds should be estimated and reserved. These funds need to be large enough to facilitate reform, but not

so large as to allow continued funding of ineffective artificial production activities while reform proceeds. The request for the appropriate size of this fund will need to be developed over the next several months. It is anticipated that funding for the transition activities will come from ratepayers, federal taxpayers, and others. Without providing the funds needed for reform, managers will be reluctant to undertake the work required to evaluate their programs against the standards.

Recommendation: ***All relevant funding sources will need to provide transition funding necessary for artificial production reform.***

Recommendation: ***Authorize reprogramming of funding from existing artificial production programs or facilities where necessary so that funding can be retained and applied to other appropriate tools (whether new artificial production or some other strategy) to meet fish and wildlife responsibilities.***

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HATCHERY APPENDIX E

Fed-1 Plan for Artificial Propagation (DRAFT)

I. Executive Summary

This draft proposal is offered by the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) in connection with on-going negotiations under *US v. Oregon* to develop, among other things, an artificial propagation program for a new Columbia River Fish Management Plan (CRFMP). The federal parties have attempted to craft a proposal that addresses the multiple management objectives of conservation of natural fish as well as providing for important fisheries. **However, as a component of the negotiation, all elements of this proposal are subject to change.**

The artificial propagation proposal is structured as follows:

First, a **"**key**"** is provided that categorizes the various management goals and objectives of artificial production measures utilized in this proposal.

Second, a regional summary of the status of each species and the artificial production strategy proposed for each sub-basin are listed in very condensed form. This summary is labeled Table 1.

Third, a series of regional-specific summary tables and associated text to elaborate on the tables is provided for each of four major sub-regions of the Columbia Basin. Summary Table 2 covers the Snake River Basin; Table 3, the upper Columbia River (above Priest Rapids Dam); Table 4, middle Columbia Region (Bonneville to Priest Rapids Dams); and Table 5, the Lower Columbia River (below Bonneville Dam). These tables identify the management objectives for each species/sub-basin combination for the region by reference to the management goals and objectives **"**key**"** at the beginning of the document (and summarized in a footnote at the bottom of each page).

Fourth, using the Grande Ronde as an example, we identify the information and considerations that led to our proposal in Fed-1 for that sub-basin. This level of analysis should assist in providing needed guidance for developing an artificial propagation component of a Sub-basin plan and eventually could serve to explain to the public and others the rationale and reasoning co-managers used in crafting the plan. Time has not allowed completion of this step for the other sub-basins, but we believe that this step eventually would be necessary.

II. Management Objectives and Goals

1. **Conservation of Genetic Resources** to prevent extinction of important gene resources, to preserve future opportunity for recovery of natural populations, and to assist in recovery of natural populations. Hatchery actions taken may include captive broodstock, gene banking, maintaining hatchery reserve for future use in natural stock restoration, and Asupplementation@ to assist or speed in recovery of natural populations.
   a. Preservation
   b. Enhancement/unrestricted - Unrestricted exchange between hatchery and local wild fish, both within the hatchery and on the targeted spawning grounds.
   c. Enhancement/controlled - Managed (controlled) exchange between hatchery and local wild fish, both within the hatchery and on the targeted spawning grounds.
   d. No immediate action, manage for natural production

2. **Reintroduction -** Re-establishing species/stocks of salmon into historically used habitat. May include multiple management objectives of fisheries and natural stock enhancements.

3. **Fishery Augmentation Objective -** Program designed primarily to enhance fishing opportunities.

III. Regional Summary of Artificial Propagation Programs Proposed for the CRFMP

TABLE 1. Condensed Summary of Proposed Regional Actions

REGION	SPECIES	STATUS	PROPOSED ACTIONS
Snake River Basin	Spring/Summer Chinook	High Risk of Extinction	1. Continue conservation strategies in upper Salmon, S.F. Fork Salmon, Imnaha, Grande Ronde , and Tucannon Rivers. 2. Implement new conservation program for Lemhi River. 3. Maintain control/hands off areas such as M.F. Salmon, Minam, and Wenaha Rivers. Intervene in these areas only if required to prevent immediate extinction. 4. Provide limited terminal fishery opportunities that selectively target hatchery fish (Rapid River, Clearwater Basin, S.F. Salmon, and others that may recovery over time). 5. Allow greater flexibility for implementing tribal program in Clearwater Basin. Continue implementation of NPT Hatchery. 6. Monitor and evaluate actions.
	Fall Chinook	Depressed, increasing trend in recent years	1. Continue supplementation above Lower Granite Dam into the main-stem Snake and Clearwater Rivers. Continue releases at Lyons Ferry Hatchery for broodstock. 2. Continue use of yearling smolts in near term for the expected survival advantage. Begin assessing transition

REGION	SPECIES	STATUS	PROPOSED ACTIONS
			to a sub-yearling program that more closely mimics the natural life history. 3. Control out of basin straying - Lower Granite Dam trapping. Begin incorporating naturally produced fish into hatchery broodstock once straying controlled. 4. Monitor and evaluate.
	Steelhead	Depressed, B run population worse off than A run	1. Transition to locally derived broodstock in Salmon, Grande Ronde, and Tucannon Rivers. 2. Manage hatchery program to achieve multiple management objectives of conservation and fisheries augmentation (selective). 3. Conservation/supplementation actions proposed for B run fish in the South Fork Clearwater (Dworshak Hatchery population), M.F. Clearwater (Dworshak or local stock), and lower Lochsa River (local stock). Exploring options for intervention in S.F. Salmon River. Controls: Selway, upper Lochsa, and M.F. Salmon River. 4. Conservation/supplementation actions proposed for A run fish in the Tucannon, Imnaha (Sheep Creek), Grande Ronde, and Salmon Rivers using local stock.
	Sockeye	Endangered	1. Continue with current program, assess performance.
	Coho	Extinct	1. Supports tribal efforts to re-introduce into the Clearwater.2. Assess other actions as management plans developed by co-managers.

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REGION	SPECIES	STATUS	PROPOSED ACTIONS
Upper Columbia River	Spring Chinook	High Risk of Extinction	1. Proposes to implement multiple strategies as defined in the mid-Columbia HCP.
	Fall/Summer Chinook	Stable Population - part of Hanford Reach ESU	1. Continues current programs. 2. Defers decision on implementation of Grant County PUD=s obligation as defined in HCP to future analysis that considers the potential effects of this production with the harvest management scheme.
	Steelhead	High Risk of Extinction	1. Proposes to manage steelhead to achieve multiple objectives of conservation and to provide harvest opportunities. 2. Follows HCP 3. Develop local broodstock for use on Wenatchee River.
	Coho	Extinct	1. Proposes to support YIN recommended program to re-introduce into the Methow River. 2. Transition to collecting locally returning broodstock. 3. Do not mark for selective fishery.
	Sockeye	low extinction risk, recent sharp decline in population	1. Continue current program for Lake Wenatchee and Casimer Bar. 2. Defers implementation of HCP to future analysis on the effects of harvest management scheme.

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REGION	SPECIES	STATUS	PROPOSED ACTIONS
Middle Columbia Region	Spring Chinook	low extinction risk, locally depressed pops	1. Primary use in region is for fishery augmentation and re-introductions into historic habitats. 2. Continue terminal fishery opportunity in Drano Lake, and Wind River (Carson Stock) and selective fishery for Ringold. 3. Continue to operate Dechutes Basin program as integrated hatchery/wild unit. In near term operate for harvest augmentation while maintaining similarity between hatchery and wild fish. Limit hatchery fish on natural production area. 4. Tribal view of supplementation supported in Yakima River. 5. Supports re-introduction into Hood River and (ongoing with Dechutes stock), Walla Walla River (new tribal facility) and Big White Salmon River (1-2 generation program when Condit Dam removed). 6. Supports tribal expansion of current program for Umatilla River. 7. John Day River remains hands off.
	Fall Chinook	URBs healthy	1. Hatchery system operated primary to augment fishery opportunities. Links hatchery programs with the need to have compatible harvest management schemes that target surplus hatchery fish. 2. Supports tribal proposal to reduce Umatilla River program (replaced with out planting hatchery adults for

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REGION	SPECIES	STATUS	PROPOSED ACTIONS
			natural production and linked to Walla Walla spring chinook re-introduction). 3. Klickitat program continues with 100% tagging to control straying into upper Snake River. Yakima River program continues. 4. Calls for assessing effects of URB spawning (hatchery strays?) on tule fall chinook in Bonneville Pool tributaries.
	Coho	Extinct	1. Managed for multiple management objectives of fishery augmentation and establishing natural populations. 2. Calls for transition to locally returning broodstock in programs (Yakima and Umatilla Rivers). 3. Mark for selective fishery except for Umatilla and Yakima re-introduction programs. 4. Assess other actions as management plans developed.
	Steelhead	depressed	1. Minimizes use of artificial propagation for conservation. Relies primarily on natural processes and habitat fixes. 2. Calls for transition from currently used non-local stocks to locally derived broodstocks in selective fisheries programs (Klickitat, Big White, Hood, and lower Walla Walla Rivers). 3. Out of basin straying into Dechutes identified as problem.

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REGION	SPECIES	STATUS	PROPOSED ACTIONS
			4. Supplementation programs ongoing for the Hood and Umatilla Rivers with locally derived stock.
Lower Columbia	Spring Chinook	Risk of Extinction	1. Manage for natural production in upper portions of Sandy, Clackamas, Kalama, etc. Rivers. Minimize hatchery strays to these areas. 2. Assess potential for transitioning to locally derived broodstock for Sandy River and other areas as appropriate. 3. Continue and expand terminal and selective fisheries. 4. Continue growth of SAFE where compatible w/ESA 5. Reintroduction in upper Cowlitz. 6. Manage fisheries for minimal, incidental take of wild populations. 7. Promote habitat restoration.
	Fall Chinook (URB, RRB)	Non-ESU, Colonizing	1. Control straying and manage for minimal levels (<5%). 2. Operate as isolated hatchery programs only. 3. Investigate effects of colonizing hatchery fish on native tule fall chinook. Take corrective action as needed.
	Fall Chinook (Tule)	Risk of Extinction	1. Minimize stray rates. 2. Awaiting key listing determinations on ESU status of hatchery and natural populations.

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REGION	SPECIES	STATUS	PROPOSED ACTIONS
			3. No long term supplementation programs anticipated; short term (1-2 generation) re-introductions may be appropriate for recovery 4. Fishery augmentation programs to be realigned to increase fishery benefits; movement to SAFE and/or target for selective fisheries when appropriate. 5. Promote habitat restoration.
	Coho	Uncertain: High Risk of Extinction or Extinct	1. Promote, support, and expand existing production into selective and/or SAFE fisheries as appropriate. 2. Promote existing and expanded stock structure with the hatchery and natural production system. 3. Initiate short term (1-2 generation) re-introduction programs into historic habitat as needed. 4. Decrease reliance on lower river broodstock for upriver reintroduction as local upriver broodstocks are developed. 5. Minimize straying of domesticated hatchery stocks. 6. Allow existing natural populations to recover w/o supplementation. 7. Evaluate current program involving NF Clackamas R. coho. 8. Promote habitat restoration.
	Chum	Risk of Extinction	1. Investigate risk/benefits of initiating chum re-introduction program. Evaluate program utilizing Grays River stock at Grays River Hatchery to reintroduce chum to two adjacent streams. If beneficial, initiate a staged re-introduction program.

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REGION	SPECIES	STATUS	PROPOSED ACTIONS
			2. Supplementation expected to be short term program. 3. Protect populations from excessive incidental harvest. 4. Promote habitat restoration.
	Summer Steelhead	Risk of Extinction	1. Manage for natural production in upper portions of Sandy, Clackamas, Kalama, etc. Rivers. Minimize hatchery strays to these areas. 2 Manage and target hatchery fish for selective fishing. 3. Manage fisheries for minimal, incidental take of wild populations. 4. Rely primarily on habitat and other improvements to promote restoration of natural population. Minimize use of hatchery fish for supplementation of wild populations. 5. Eliminate cross-basin out planting unless program is isolated. 6. Develop and transition to local broodstocks. 7. Reduce incidental take from trout programs and fisheries.
	Winter Steelhead	Risk of Extinction	1. Manage for natural production in upper portions of Sandy, Clackamas, Kalama, etc. Rivers. Minimize hatchery strays to these areas. 2 Manage and target hatchery fish for selective fishing. 3. Manage fisheries for minimal, incidental take of wild populations. 4. Rely primarily on habitat and other improvements to

REGION	SPECIES	STATUS	PROPOSED ACTIONS
			promote restoration of natural population. Minimize use of hatchery fish for supplementation of wild populations. 5. Eliminate x-basin out planting unless program is isolated. 6. Develop and transition to local broodstocks. 7. Reduce incidental take from trout programs and fisheries.
	Sea-run Cutthroat	Risk of Extinction	1. Rely primarily on habitat and other improvements to promote restoration of natural population. Minimize use of hatchery fish for supplementation of wild populations. 2. Initiate short term (1-2 generation) re-introduction programs into historic habitat as needed. 3. Evaluate benefits of current hatchery programs. 4. Minimize hatchery strays. 5. Manage for selective fishery to minimize incidental take. 6. Transition to local broodstock.

IV. Snake River Artificial Propagation Regional Summary

Table 2. Snake River Regional Summary

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
Tucannon River	Spring chinook - severely depressed and declining.	a.,.c.		x	Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations.	1) continue current conventional program, 2) assess the need for initiating a captive brood program as means of boosting the population size while maintaining the within population diversity, 3) potentially use as donor stock for Asotin Ck., and 4) target surplus hatchery fish for selective terminal fisheries.
	Summer steelhead-seriously depressed and declining.	c.		x	Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s) , and provide for fishery opportunities.	1) limit release of LF stock to sites below major steelhead spawning and rearing habitat, 2) prevent LF stock from straying above Tucannon weir, 3) use existing trap to collect endemic adults for artificial program, 4) phase out non-endemic program as endemic population builds, and 5) manage returns to accomplish multiple goals of natural stock rebuilding and selective fishing.
	Fall chinook (see					

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

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Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	mainstem Snake River)					
Asotin Creek	Spring chinook - probably extinct		x		Reestablish a naturally self sustaining population with appropriate stock	1) reintroduce appropriate stock when available (potentially Tucannon).
	Summer steelhead- depressed at a very low level	d.			Preserve existing naturally reproducing endemic population(s); however, allow natural process to occur	1) maintain current program (no program) 2) manage as a control stream for Tucannon supplementation.
Grande Ronde River	Spring chinook- severely depressed and declining with high risk of extinction.	a, c	x	x	Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations.	1) discontinue artificial propagation of marked Rapid R. returns, 2) continue captive brood programs in Catherine, Lostine and Upper Grande Ronde, 3) initiate propagation programs with endemic returns to Catherine, Lostine and Upper Grande Ronde, 4) continue reintroduction program of naturalized hatchery fish to Lookingglass Ck. until endemic programs are developed, 5) maintain Minam and Wenaha as wild reserves and assess need/ability to initiate intervention programs to prevent extinction, and 6) target surplus hatchery fish for selective

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						terminal fisheries.
	Summer steelhead- moderately depressed with slight increasing trend	a, c		x	Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s) , and provide for fishery opportunities	1) develop plans and initiate phase-in of endemic programs in the lower Grande, upper Grande Ronde, and Lostine/Wallowa, 2) determine the type of artificial program (conventional or captive brood) that is appropriate, 3) modify Wallowa stock program during endemic stock phase-in to provide harvest opportunities and reduce straying problems, and 4) manage the Minam, Wenaha, and Joseph Creek as wild stock controls and assess need/ability to initiate intervention programs to prevent extinction.
	Fall chinook (see mainstem Snake River)					
Imnaha River	Spring chinook- depressed with short term risk of extinction.	a, c		x	Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery	1) continue existing Imnaha artificial propagation program, 2) assess need/ability to initiate captive broodstock program(s) for additional populations, and 3) target surplus hatchery fish for selective terminal fisheries.

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
					populations	
	Summer steelhead-no consensus, ranged from moderately to severely depressed with trend unknown.	a, c		x	Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s), and provide for fishery opportunities	1) maintain the Little Sheep Ck program, expanding it to include the Big Sheep, 2) manage the lower tributaries (Horse, Cow, and Lightning), Camp Ck, and upper mainstem Imnaha as wild stock controls , 3) assess need/ability to initiate intervention programs to prevent extinction of the populations listed above, and 4) target surplus hatchery fish for selective terminal fisheries.
Lower Clearwater River	Spring chinook- endemic stocks extinct, introduced stocks declining and at a very depressed level.		x	x	Establish naturally self sustaining population(s) and provide fishery opportunities.	1) maintain existing Dworshak and Kooskia programs, 2) continue ISS studies, 3) initiate NPTH program, 4) co-managers review individual stream populations for potential to initiate new program(s) using natural returns, 5) transition to broodstock collection of local naturalized populations to promote local adaptation, and 6) target surplus hatchery fish for selective terminal fisheries.
	Summer steelhead- natural AA@ and AB@	a, b		x	Maintain current hatchery program to preserve unique NF AB@ stock, provide for fisheries	1) maintain current direct release from Dworshak NFH, 2) determine when, where, and levels of off-station releases, 3) modify

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	populations at low levels and declining. Hatchery populations are large and stable.				compensation, and use off-station releases to augment natural spawning	off-station releases as agreed to, 4) co-managers review individual stream populations for potential to initiate new program(s) using natural returns; 5) transition to broodstock collection of local naturalized populations to promote local adaptation, and 6) target surplus hatchery fish for selective terminal fisheries.
	Fall chinook (see mainstem Snake River)					
South Fork Clearwater River	Spring chinook-endemic stocks extinct, introduced stocks are at low levels with variable trends		x	x	Establish naturally self sustaining population(s) and provide fishery opportunities.	1) maintain existing Clearwater program, 2) continue ISS studies, 3) initiate NPTH program, 4) co-managers review individual stream populations for potential to initiate new program(s) using natural returns, 5) transition to broodstock collection of local naturalized populations to promote local adaptation, and 6) target surplus hatchery fish for selective terminal fisheries.
	Summer		x	x	Maintain current hatchery	1) supplement with Dworshak B-s, using

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	steelhead- native stock believed to be extinct, natural spawners are depressed				program while providing for fisheries compensation and use off-station releases to augment natural spawning.	later spawning steelhead while maintaining a harvest fishery using differential marking, 2), investigate 2-year rearing program at Clearwater FH, 3) assess options for using existing/new traps with natural returns (e.g. Crooked R.) to develop local populations, 4) transition to broodstock collection of local naturalized populations to promote local adaptation, and 5) target surplus hatchery fish for selective terminal fisheries.
Lochsa River, Clearwater Basin	Spring chinook- endemic stocks extinct, introduced stocks declining and at a very depressed level		x		Establish naturally self sustaining population(s) and provide fishery opportunities.	1) maintain existing Clearwater program, 2) continue ISS studies, 3) initiate NPTH program, 4) co-managers review individual stream populations for potential to initiate new program(s) using natural returns, 5) transition to broodstock collection of local naturalized populations to promote local adaptation, and 6) target surplus hatchery fish for selective terminal fisheries.
	Summer steelhead- depressed with variable returns	c, d		x	Preserve existing endemic population(s), assist in rebuilding naturally reproducing endemic	1) monitor index production areas and annual run projections, 2) determine artificial program to be implemented to ensure populations persist in the lower

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
					population(s) , and provide for fishery opportunities.	Lochsa and tributaries (e.g. trap adults at Fish Ck. or other lower Lochsa sites or trap juveniles), 3) determine the best alternative for artificial propagation, and 4) target surplus hatchery fish for selective terminal fisheries.
Selway River, Clearwater Basin	Spring chinook-native stocks extinct, introduced stocks depressed and declining.		x		Establish naturally self sustaining population(s) and provide fishery opportunities.	1) initiate NPTH program, 2) co-managers review individual stream populations for potential to initiate new program(s) using natural returns, 3) transition to broodstock collection of local naturalized populations to promote local adaptation, and 4) target surplus hatchery fish for selective terminal fisheries.
	Summer steelhead-populations are at low levels and declining.	d			Preserve existing population structure; however, allow natural processes to occur	1) monitor index production areas and annual run projections; 2) Manage as a control for Lochsa supplementation.
Lower Salmon River	Spring chinook-status is believed to be similar to the rest of the Salmon	a		x	Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide	1) continue Rapid R. program under Section 10; 2) review status of tributary populations; 3) establish guidelines for intervention; 4) assess feasibility of programs; 5) if feasible, initiate either

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	River.				fisheries on surplus hatchery populations.	captive brood or conventional program with local stock, and 6) target surplus hatchery fish for selective terminal fisheries.
	Summer steelhead- population low level and declining, except that Rapid River population appears to be relatively stable.	b, c		x	Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s), and provide for fishery opportunities	1) Manage existing programs for minimal impact to endemic populations; 2) determine the biological and legal appropriateness and feasibility of using existing stocks for augmenting natural production; 3) if existing stocks are not appropriate, determine feasibility of developing endemic program using Rapid River stock or a composite of RR and other local tributaries; 4) if local stock is developed, phase-out Oxbow stock; and 5) target surplus hatchery fish for selective terminal fisheries.
Middle Fork Salmon River	Spring/summer chinook - depressed with long term declining trend, significant risk of	d, a			Preserve existing endemic population(s) until productivity improves	1) Manage basin as a wild fish sanctuary; allowing natural processes to occur. [Note: If populations continue to decline: a) analyze biological and legal (Wilderness Area) feasibility of intervening with an artificial propagation program(s); b) review status of tributary populations; c) establish

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	extinction					guidelines for intervention with a goal of ensuring the persistence of the distinct populations; d) assess the feasibility of programs; e) if feasible, initiate either captive brood, supplementation, or egg bank (i.e. rearing and releasing outside the M.F.) programs, and f) target surplus hatchery fish for selective terminal fisheries.]
	Summer steelhead - population is at low level and declining	d			Preserve existing endemic population(s) until productivity improves.	1) Manage basin as a wild fish sanctuary; allowing natural processes to occur. [Note: If populations continue to decline: a) analyze biological and legal (Wilderness Area) feasibility of intervening with an artificial propagation program(s); b) review status of tributary populations; c) establish guidelines for intervention with a goal of ensuring the persistence of the distinct populations; d) assess the feasibility of programs; e) if feasible, initiate either captive brood, supplementation, or egg bank (i.e. rearing and releasing outside the M.F.) programs, and f) target surplus hatchery fish for selective terminal fisheries.]

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
South Fork Salmon River	Summer chinook- depressed with low numbers, trend variable.	c		x	Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations.	1) continue artificial propagation programs in the South Fork (McCall FH) and Johnson Ck, 2) maintain tributaries as wild reserves and assess need/ability to initiate intervention program(s) to prevent extinction, and 3) target surplus hatchery fish for selective terminal fisheries.
	Summer steelhead- population is at low level and declining.	a, d		x	Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s), and provide for fishery opportunities.	1) assess the status of local populations and potential for artificial propagation programs, 2) determine if, when, where, and how to intervene, 3) develop an endemic program for natural spawning augmentation, assess the options for relocating a stock(s) to an outside basin facility (e.g. Rapid River) to build stock for releases back to the SF, and 4) assess the need for initiating a captive brood program to boost population numbers for short period (3-4 years).
Upper Salmon River	Spring/summer chinook - depressed at very low numbers, long term declining	a, c		x	Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide	1) maintain existing Sawtooth and Pahsimeroi programs as part of ISS studies, 2) continue captive rearing studies, assessing success of adults plants, 3) co-managers review individual stream

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	trend, and significant risk of extinction.				fisheries on surplus hatchery populations.	populations (e.g. Lemhi) for potential to initiate new endemic program(s) using Sawtooth for rearing and new facilities for acclimation/trapping; 4) if feasible, initiate Lemhi or other appropriate program; and 5) target surplus hatchery fish for selective terminal fisheries.
	Summer steelhead- populations are declining and depressed at very low numbers, composition of naturally spawning fish is uncertain	c		x	Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s), and provide for fishery opportunities	1) manage existing programs for minimal impact to endemic populations, 2) determine feasibility of developing an endemic program using Lemhi stock and/or an appropriate Salmon R. stock, 3) if local stock is developed, phase-out current non-endemic program while phasing in the endemic program(s), and 4) target surplus hatchery fish for selective terminal fisheries.
Mainstem Snake River	Spring chinook - population at low level			x	Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations	1) maintain the current Rapid R. stock program.

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

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Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	Fall chinook - depressed, but increasing trend in recent years	c			Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations	1) maintain the existing yearling program with direct and acclimated releases and 2) allocate subyearling releases in 200K groups to mainstem Snake, Clearwater R, and Lyons Ferry.
	Summer steelhead -populations in minor tributaries are at very low levels and declining	c		x	Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s) , and provide for fishery opportunities	1) continue artificial propagation programs at Oxbow and Lyons Ferry FH; 2) review potential sources of a replacement stock; 3) assess feasibility and necessity of replacing LF program; 4) if feasible, initiate either captive brood or conventional program with local stock; and 5) manage returns of new program to accomplish multiple goals of natural stock rebuilding and selective fishing

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish in target stream, c. Enhancement -controlled used of hatchery fish, d. No immediate action;
2) Reintroduction into historical habitat;
3) Fishery augmentation program.

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Snake River Basin Region

Tucannon

Spring/Summer Chinook

Status: Population is severely depressed and declining. **Goals**: Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations. **Proposed actions**: 1) continue current conventional program, 2) assess the need for initiating a captive brood program as means of boosting the population size while maintaining the within population diversity, 3) potentially use as donor stock for Asotin Ck., and 4) target surplus hatchery fish for selective terminal fisheries.

Summer Steelhead (A)

Status: Seriously depressed and declining. **Goals**: Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s), and provide for fishery opportunities. **Proposed actions**: 1) limit release of LF stock to sites below major steelhead spawning and rearing habitat, 2) prevent LF stock from straying above Tucannon weir, 3) use existing trap to collect endemic adults for artificial program, 4) phase out non-endemic program as endemic population builds, and 5) manage returns to accomplish multiple goals of natural stock rebuilding and selective fishing.

Fall chinook (see mainstem Snake River)

Asotin Creek

Spring/Summer Chinook

Status: no redds or fish observed since 1993, probably extinct. **Goal**: Reestablish a naturally self sustaining population with appropriate stock. **Proposed actions**: 1) reintroduce appropriate stock when available (potentially Tucannon).

Summer steelhead (A)

Status: Depressed at a very low level. **Goal**: Preserve existing naturally reproducing endemic population(s); however, allow natural process to occur. **Proposed actions**: 1) maintain current program (no program) 2) manage as a control stream for Tucannon supplementation.

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Grande Ronde

Spring/summer chinook

Status: Severely depressed and declining with high risk of extinction. **Goals**: Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations. **Proposed actions**: 1) discontinue artificial propagation of marked Rapid R. returns, 2) continue captive brood programs in Catherine, Lostine and Upper Grande Ronde, 3) initiate propagation programs with endemic returns to Catherine, Lostine and Upper Grande Ronde, 4) continue reintroduction program of naturalized hatchery fish to Lookingglass Ck. until endemic programs are developed, 5) maintain Minam and Wenaha as wild reserves and assess need/ability to initiate intervention programs to prevent extinction, and 6) target surplus hatchery fish for selective terminal fisheries.

Summer steelhead (A)

Status: Moderately depressed with no immediate risk of extinction. Slight increasing trend for the last 4 years for Joseph Creek and Chesnimnus Creek. **Goals**: Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s) , and provide for fishery opportunities **Proposed actions**: 1) develop plans and initiate phase-in of endemic programs in the lower Grande Ronde, upper Grande Ronde, and Lostine/Wallowa, 2) determine the type of artificial program (conventional or captive brood) that is appropriate, 3) modify Wallowa stock program during endemic stock phase-in to provide harvest opportunities and reduce straying problems, and 4) manage the Minam, Wenaha, and Joseph Creek as wild stock controls and assess need/ability to initiate intervention programs to prevent extinction.

Fall chinook (see mainstem Snake River)

Imnaha

Spring/summer chinook

Status: Depressed with short term risk of extinction. **Goals**: Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations . **Proposed actions**: 1) continue existing Imnaha artificial propagation program, 2) assess need/ability to initiate captive broodstock program(s) for additional populations, and 3) target surplus hatchery fish for selective terminal fisheries.

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Summer steelhead (A)

Status: No consensus reached, opinions ranged from moderately depressed with no apparent trend to depressed with declining trend. **Goals**: Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s), and provide for fishery opportunities **Proposed actions**: 1) maintain the Little Sheep Ck program, expanding it to include the Big Sheep, 2) manage the lower tributaries (Horse, Cow, and Lightning), Camp Ck, and upper mainstem Imnaha as wild stock controls , 3) assess need/ability to initiate intervention programs to prevent extinction of the populations listed above, and 4) target surplus hatchery fish for selective terminal fisheries.

Middle Fork, Mainstem, North Fork Clearwater River

Spring chinook

Status: endemic stocks extinct, introduced stocks declining and at a very depressed level. **Goals**: Establish naturally self sustaining population(s) and provide fishery opportunities. **Proposed actions**: 1) maintain existing Dworshak and Kooskia programs, 2) continue ISS studies, 3) initiate NPTH program, 4) co-managers review individual stream populations for potential to initiate new program(s) using natural returns, 5) transition to broodstock collection of local naturalized populations to promote local adaptation, and 6) target surplus hatchery fish for selective terminal fisheries.

Summer steelhead (A and B)

Status: Natural AA@ and AB@ populations at low levels and declining. Hatchery populations are large and stable. **Goals**: Maintain current hatchery program to preserve unique NF AB@ stock, provide for fisheries compensation, and use off-station releases to augment natural spawning. **Proposed actions**: 1) maintain current direct release from Dworshak NFH, 2) determine when, where, and levels of off-station releases, 3) modify off-station releases as agreed to, 4) co-managers review individual stream populations for potential to initiate new program(s) using natural returns; 5) transition to broodstock collection of local naturalized populations to promote local adaptation, and 6) target surplus hatchery fish for selective terminal fisheries.

Fall chinook (see mainstem Snake River)

SF Clearwater

Spring chinook

Status: Endemic stocks extinct, introduced stocks are at low levels with variable trends. **Goals**: Establish naturally self sustaining population(s) and provide fishery opportunities. **Proposed actions**: 1) maintain existing Clearwater program, 2) continue ISS studies, 3) initiate NPTH

program, 4) co-managers review individual stream populations for potential to initiate new program(s) using natural returns, 5) transition to broodstock collection of local naturalized populations to promote local adaptation, and 6) target surplus hatchery fish for selective terminal fisheries.

Summer steelhead (A and B)

Status: native stock believed to be extinct, natural spawners are depressed. **Goals**: Maintain current hatchery program while providing for fisheries compensation and use off-station releases to augment natural spawning. **Proposed actions**: 1) supplement with Dworshak B-s, using later spawning steelhead while maintaining a harvest fishery using differential marking, 2), investigate 2-year rearing program at Clearwater FH, 3) assess options for using existing/new traps with natural returns (e.g. Crooked R.) to develop local populations, 4) transition to broodstock collection of local naturalized populations to promote local adaptation, and 5) target surplus hatchery fish for selective terminal fisheries.

Lochsa

Spring chinook

Status: endemic stocks extinct, introduced stocks declining and at a very depressed level. **Goals**: Establish naturally self sustaining population(s) and provide fishery opportunities. **Proposed actions**: 1) maintain existing Clearwater program, 2) continue ISS studies, 3) initiate NPTH program, 4) co-managers review individual stream populations for potential to initiate new program(s) using natural returns, 5) transition to broodstock collection of local naturalized populations to promote local adaptation, and 6) target surplus hatchery fish for selective terminal fisheries.

Summer steelhead (B)

Status: Depressed, but variable or stable returns. Upper tributaries have habitat issues. Lower tributaries may support the most stable returns. **Goals**: Preserve existing endemic population(s), assist in rebuilding naturally reproducing endemic population(s), and provide for fishery opportunities. **Proposed actions**: 1) monitor index production areas and annual run projections, 2) determine artificial program to be implemented to ensure populations persist in the lower Lochsa and tributaries (e.g. trap adults at Fish Ck. or other lower Lochsa sites or trap juveniles), 3) determine the best alternative for artificial propagation, and 4) target surplus hatchery fish for selective terminal fisheries.

Selway

Spring chinook

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Status: native stocks extinct, introduced stocks depressed and declining. **Goals**: Establish naturally self sustaining population(s) and provide fishery opportunities. **Proposed actions**: 1) initiate NPTH program, 2) co-managers review individual stream populations for potential to initiate new program(s) using natural returns, 3) transition to broodstock collection of local naturalized populations to promote local adaptation, and 4) target surplus hatchery fish for selective terminal fisheries.

Summer steelhead (B)

Status: populations are at low levels and declining. **Goals**: Preserve existing population structure; however, allow natural processes to occur. **Proposed actions**: 1) monitor index production areas and annual run projections; 2) Manage as a control for Lochsa supplementation.

Lower Salmon

Spring/summer chinook

Status: Believed to be similar to the rest of the Salmon River. **Goals**: Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations. **Proposed actions**: 1) continue Rapid R. program under Section 10; 2) review status of tributary populations; 3) establish guidelines for intervention; 4) assess feasibility of programs; 5) if feasible, initiate either captive brood or conventional program with local stock, and 6) target surplus hatchery fish for selective terminal fisheries.

Summer steelhead (A)

Status: Population low level and declining, except that Rapid River population appears to be relatively stable. **Goals**: Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s), and provide for fishery opportunities. **Proposed actions**: 1) Manage existing programs for minimal impact to endemic populations; 2) determine the biological and legal appropriateness and feasibility of using existing stocks for augmenting natural production; 3) if existing stocks are not appropriate, determine feasibility of developing endemic program using Rapid River stock or a composite of RR and other local tributaries; 4) if local stock is developed, phase-out Oxbow stock; and 5) target surplus hatchery fish for selective terminal fisheries.

SF Salmon

Summer chinook

Status: depressed with low numbers, trend variable. **Goals**: Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic

population(s), and provide fisheries on surplus hatchery populations. **Proposed actions**: 1) continue artificial propagation programs in the South Fork (McCall FH) and Johnson Ck, 2) maintain tributaries as wild reserves and assess need/ability to initiate intervention program(s) to prevent extinction, and 3) target surplus hatchery fish for selective terminal fisheries.

Summer steelhead (A/B)

Status: Limited information suggests that the population is at low level and declining. **Goals**: Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s), and provide for fishery opportunities. **Proposed actions**: 1) assess the status of local populations and potential for artificial propagation programs, 2) determine if, when, where, and how to intervene, 3) develop an endemic program for natural spawning augmentation, consider relocating a stock(s) to an outside basin facility (e.g. Rapid River) to build stock for releases back to the SF, and 4) assess the need for initiating a captive brood program to boost population numbers for short period (3-4 years).

<u>Middle Fork</u>

Spring/summer chinook

Status: depressed with long term declining trend, significant risk of extinction. **Goal**: Preserve existing endemic population(s) until productivity improves. **Proposed actions**: 1) Manage basin as a wild fish sanctuary; allowing natural processes to occur.
[Note: If populations continue to decline: a) analyze biological and legal (Wilderness Area) feasibility of intervening with an artificial propagation program(s); b) review status of tributary populations; c) establish guidelines for intervention with a goal of ensuring the persistence of the distinct populations; d) assess the feasibility of programs; e) if feasible, initiate either captive brood, supplementation, or egg bank (i.e. rearing and releasing outside the M.F.) programs, and f) target surplus hatchery fish for selective terminal fisheries.]

Summer steelhead (A/B)

Status: Limited information suggests that the population is at low level and declining. **Goals**: Preserve existing endemic population(s) until productivity improves. **Proposed actions**: 1) Manage basin as a wild fish sanctuary; allowing natural processes to occur.
[Note: If populations continue to decline: a) analyze biological and legal (Wilderness Area) feasibility of intervening with an artificial propagation program(s); b) review status of tributary populations; c) establish guidelines for intervention with a goal of ensuring the persistence of the distinct populations; d) assess the feasibility of programs; e) if feasible, initiate either captive brood, supplementation, or egg bank (i.e. rearing and releasing outside the M.F.) programs, and f) target surplus hatchery fish for selective terminal fisheries.]

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Upper Salmon R and tribs (above Panther Ck)

Spring/summer chinook

Status: Depressed at very low numbers, long term declining trend, and significant risk of extinction. **Goals**: Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations. **Proposed actions**: 1) maintain existing Sawtooth and Pahsimeroi programs as part of ISS studies, 2) continue captive rearing studies, assessing success of adults plants, 3) co-managers review individual stream populations (e.g. Lemhi) for potential to initiate new endemic program(s) using Sawtooth for rearing and new facilities for acclimation/trapping; 4) if feasible, initiate Lemhi or other appropriate program; and 5) target surplus hatchery fish for selective terminal fisheries.

Summer steelhead (A)

Status: Populations are declining and depressed at very low numbers, composition of naturally spawning fish is uncertain. **Goals**: Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s), and provide for fishery opportunities. **Proposed actions**: 1) manage existing programs for minimal impact to endemic populations, 2) determine feasibility of developing an endemic program using Lemhi stock and/or an appropriate Salmon R. stock, 3) if local stock is developed, phase-out current non-endemic program while phasing in the endemic program(s), and 4) target surplus hatchery fish for selective terminal fisheries.

Mainstem Snake River

Spring/Summer Chinook

Status: Population at low level with questionable habitat to support a distinct population. **Goals**: Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations. **Proposed actions**: 1) maintain the current Rapid R. stock program.

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Fall Chinook

Status: Depressed, but increasing trend in recent years. Current population is limited to remnant habitat below Hells Canyon Dam. The primary habitat is in the mainstem Snake, Clearwater, Grande Ronde, and Tucannon rivers. **Goals**: Preserve existing endemic population(s) until productivity improves, assist in rebuilding naturally reproducing endemic population(s), and provide fisheries on surplus hatchery populations. **Proposed actions**: 1) maintain the existing yearling program with direct and acclimated releases, 2) allocate subyearling releases in 200K groups to mainstem Snake, Clearwater R, and Lyons Ferry, and 3) initiate subyearling releases in the lower Grande Ronde when production is greater than 2 million.

Summer steelhead (A)

Status: Populations in minor tributaries are at very low levels and declining. **Goals**: Preserve existing endemic population (s), assist in rebuilding naturally reproducing endemic population(s) , and provide for fishery opportunities. **Proposed actions**: 1) continue artificial propagation programs at Oxbow and Lyons Ferry FH; 2) review potential sources of a replacement stock; 3) assess feasibility and necessity of replacing LF program; 4) if feasible, initiate either captive brood or conventional program with local stock; and 5) manage returns of new program to accomplish multiple goals of natural stock rebuilding and selective fishing.

V. Upper Columbia Region, Above Priest Rapids Dam

Table 3. Upper Columbia Regional Summary

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
Okanogan River	Summer/fall Chinook low risk of extinction	c		X	Increase naturally spawning population. Maintain viable natural population. Provide harvest opportunity.	Continue 0.576 M yearling release. Assess effects of yearling program on long term viability of population.
	Summer Steelhead high risk of extinction	c		X	Insure preservation of upper Col. steelhead. Restore natural populations and promote stock structure. Provide selective fishery opportunities on hatchery fish.	Assess feasibility and transition to local broodstock from fish returning to Okanogon River if possible. Maintain 0.1 M program reared at Wells Hatchery with near term program using Wells stock. Priority is natural stock enhancement then providing fishery opportunity when appropriate.
	Sockeye Salmon low extinction	c		X	Maintain healthy viable natural population in Lake Osoyoos. Provide terminal fishing opportunity.	Current program is 0.2 M sub-yearlings using Lake Osoyoos population (Cassimer Bar hatchery).

Information in this table does not include Grant County PUD=s potential mitigation obligation under the mid-Columbia HCP. Pending future analysis of harvest effects, this table may be altered to incorporate some or all of the Grant County PUD mitigation under the HCP.

Management Objectives:
1) Conservation of genetic resources: a, Preservation; b, Enhancement - unrestricted use of hatchery fish in the target stream; c, Enhancement - controlled use of hatchery fish in target stream; d, no immediate action;
2) Reintroduction into historic habitat
3) Fishery augmentation program

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Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	risk, but recent depressed level					
Methow River	Spring Chinook At high risk of extinction	a			Prevent extinction of at risk populations Long term goal, provide harvest opportunities.	Continue 0.738 M Methow Hatchery supplementation program using composite stock collected at Wells Dam. Phase out use of non-native stock at Winthrop Hatchery and replace with Methow composite stock and use for supplementation (0.6 M).
	Summer/fall Chinook low risk of extinction	c		X	Maintain viable natural population. Provide harvest opportunity.	Operate program for 0.4 M release . Assess potential for collecting broodstock from within basin (transition from trapping at Wells Dam).
	Coho Salmon extinct		X		Establish self-sustaining natural population.	Maintain recent release level of 1 M from Speelayi Hatchery .

Information in this table does not include Grant County PUD=s potential mitigation obligation under the mid-Columbia HCP. Pending future analysis of harvest effects, this table may be altered to incorporate some or all of the Grant County PUD mitigation under the HCP.

Management Objectives:
1) Conservation of genetic resources: a, Preservation; b, Enhancement - unrestricted use of hatchery fish in the target stream; c, Enhancement - controlled use of hatchery fish in target stream; d, no immediate action;
2) Reintroduction into historic habitat
3) Fishery augmentation program

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						Transition to collection of broodstock from fish returning to Sub-basin. Do not mark for selective fishery near term.
	Summer Steelhead high risk of extinction	c		X	Ensure preservation of upper Col. steelhead. Restore natural populations and promote stock structure. Provide selective fishery opportunities on hatchery fish.	Assess feasibility and transition to local broodstock from fish returning to Methow River if possible. Program 0.380 M release from Wells Hatchery and 0.1 M from Winthrop Hatchery with near term program using Wells stock. Priority is natural stock enhancement then providing fishery opportunity when possible.
Entiat River	Spring Chinook at high risk of extinction	a		X	Maintain natural population in basin. Provide terminal fishery targeting hatchery fish.	Assess the genetic relationship of natural and hatchery population in the basin. If same then integrate and use Entiat Hatchery to release 0.2 M in upper basin and 0.6 M at hatchery.

Information in this table does not include Grant County PUD=s potential mitigation obligation under the mid-Columbia HCP. Pending future analysis of harvest effects, this table may be altered to incorporate some or all of the Grant County PUD mitigation under the HCP.

Management Objectives:
1) Conservation of genetic resources: a, Preservation; b, Enhancement - unrestricted use of hatchery fish in the target stream; c, Enhancement - controlled use of hatchery fish in target stream; d, no immediate action;
2) Reintroduction into historic habitat
3) Fishery augmentation program

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						If natural population and hatchery populations are reproductively isolated then restrict hatchery releases to lower basin.
	Summer Steelhead high risk of extinction	a, c		X	Insure preservation of upper Col. steelhead. Restore natural populations and promote stock structure. Provide selective fishery opportunities on hatchery fish.	Near term program of 0.04 M release from Wells Hatchery. Assess the appropriateness of; 1) using Entiat River as control stream, or 2) transition to local broodstock and scatter plant (direct stream release) as comparison with acclimated release strategy elsewhere in upper Col. Basin. Priority is natural stock enhancement then providing fishery opportunity when possible.
Wenatchee River	Spring Chinook at risk of extinction	a,c		X	Maintain and recovery 4 natural populations; Chiwawa, Nason, White, and Little Wenatchee and one hatchery/wild integrated population (Leavenworth).	Continue 1.65 M release from Leavenworth and integrate with natural production in the stream, out plant to unseeded areas. Chiwawa: reduce production

Information in this table does not include Grant County PUD=s potential mitigation obligation under the mid-Columbia HCP. Pending future analysis of harvest effects, this table may be altered to incorporate some or all of the Grant County PUD mitigation under the HCP.

Management Objectives:
1) Conservation of genetic resources: a, Preservation; b, Enhancement - unrestricted use of hatchery fish in the target stream; c, Enhancement - controlled use of hatchery fish in target stream; d, no immediate action;
2) Reintroduction into historic habitat
3) Fishery augmentation program

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Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
					Provide terminal and selective fishery opportunity on hatchery fish.	objective to 0.3 M (from 0.672 M) to match stream capacity and make room for other programs below. Nason Creek and White River populations: use captive brood strategy for 2 generations to quickly increase numbers in those streams. Little Wenatchee: maintain as control/reference stream.
	Summer/fall Chinook healthy pop.	c		X	Maintain viable natural population. Provide harvest opportunity.	Operate program for 0.864 M yearling release.
	Summer Steelhead high risk of extinction	c		X	Ensure preservation of upper Col. steelhead. Restore natural populations and promote stock structure. Provide selective fishery opportunities on hatchery fish.	Transition to locally derived broodstock from Wenatchee River. Release 0.360 M smolts with appropriate marking regime that will support both natural population enhancement and selective fishery.
	Sockeye Salmon	c		X	Maintain viable natural population in Lake Wenatchee.	Continue current program is 0.2 M using Lake Wenatchee population.

Information in this table does not include Grant County PUD=s potential mitigation obligation under the mid-Columbia HCP. Pending future analysis of harvest effects, this table may be altered to incorporate some or all of the Grant County PUD mitigation under the HCP.

Management Objectives:
1) Conservation of genetic resources: a, Preservation; b, Enhancement - unrestricted use of hatchery fish in the target stream; c, Enhancement - controlled use of hatchery fish in target stream; d, no immediate action;
2) Reintroduction into historic habitat
3) Fishery augmentation program

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	low extinction risk, but recent depressed level				Provide terminal fishing opportunity.	
Main-stem Columbia River	Summer/fall Chinook healthy pop.	c		X	Maintain viable natural population. Provide fishery opportunity	Operate program to release 0.970 M yearlings and 1.62 M sub-yearlings. See attached summary for breakdown.

Information in this table does not include Grant County PUD=s potential mitigation obligation under the mid-Columbia HCP. Pending future analysis of harvest effects, this table may be altered to incorporate some or all of the Grant County PUD mitigation under the HCP.

Management Objectives:
1) Conservation of genetic resources: a, Preservation; b, Enhancement - unrestricted use of hatchery fish in the target stream; c, Enhancement - controlled use of hatchery fish in target stream; d, no immediate action;
2) Reintroduction into historic habitat
3) Fishery augmentation program

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BIOLOGICAL ASSESSMENT AND MANAGEMENT PLAN: MID-COLUMBIA RIVER HATCHERY PROGRAM

EXECUTIVE SUMMARY

This document is a consensus plan by fish co-managers for development, operation, and evaluation of anadromous salmonid hatcheries in the Columbia River upstream of the Yakima River confluence. The co-managers include National Marine Fisheries Service (NMFS), U. S. Fish and Wildlife Service, Washington Department of Fish and Wildlife, Yakama Indian Nation, Colville Confederated Tribes, the Confederated Umatilla Tribes, and Chelan, Douglas, and Grant Public Utility Districts (PUDs). This *Mid-Columbia Hatchery Program* is part of an application for a 50-year multi-species Habitat Conservation Plan (HCP) and relicensing agreement for the PUDs. This plan has two objectives: (1) To help recover natural populations throughout the Mid-Columbia Region so that they can be self-sustaining and harvestable, while maintaining their genetic and ecologic integrity; and (2) To compensate for a 7% mortality rate at each of the five PUD-owned mid-Columbia River mainstem dams (Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapids) in a manner that is consistent with the first objective. Species included in this plan include chinook salmon, steelhead, sockeye salmon, and coho salmon. When the HCP is implemented, this plan will supersede all existing anadromous hatchery plans in the Mid-Columbia Region.

The two objectives in this plan were developed to be compatible with each other, and with NMFS policy for artificial propagation under the Endangered Species Act. The first objective (recover populations that are at risk of extinction) takes precedence, and will guide the strategies used in the initial years of the hatchery program. Once it appears that populations have recovered, and if it can be done in a manner that will not jeopardize them, hatchery production of these populations will increase to meet the second objective (compensation for hydropower-related mortalities). In general, the first objective uses a more conservative approach to artificial propagation than the second objective: fewer fish are propagated and stronger measures to protect natural fish are used. The co-managers designed the recovery strategies based on continued use of the existing hatcheries in the Mid-Columbia Region; they identified how to modify them where necessary, and recommended new facilities in the region to meet program needs.

In the initial stages of developing this plan, the co-managers assessed the probability of extinction for each species in the short term (10 years) and long term (50 years), given existing conditions. Using available ecologic, genetic, and demographic data, they determined that the risk of extinction was low for summer and fall chinook salmon and for sockeye salmon, but high for spring chinook salmon and steelhead (coho salmon are extinct in the region; the means to address this is described below). The first objective (population recovery) will be employed for these high risk species. Artificial propagation of the low risk species may proceed toward the second objective (compensation for mortalities). The co-managers then used these data to determine how to delineate Apopulations@ within each species. For most species, the data indicated population divisions that generally coincided with geographic divisions. Although there are a few exceptions, most populations aggregate at the watershed level (i.e., the Wenatchee, Entiat, Methow, and Okanogan rivers). However, the data for spring chinook salmon were not conclusive, causing deliberation on the proper level of population separation and gene flow between the nominal populations.

Summer and fall chinook salmon

At this time, these fish have a low risk of extinction in the Mid-Columbia Region. There, they

predominately have an Aocean-type@ life-history, which has among many traits, a tendency to migrate to the ocean as subyearlings (less than a year after they hatch). Currently, more summer and fall chinook salmon are artificially propagated in the region than any other species. Most hatcheries rear them to a yearling stage because they survive better at that age than subyearlings. Current hatchery production is: Wenatchee River, 864,000 yearlings; Methow River, 400,000 yearlings; Okanogan River, 576,000 yearlings; Columbia River at Wells Fish Hatchery (FH), 320,000 yearlings and 484,000 subyearlings; Rocky Reach FH 200,000 yearlings and 1,620,000 subyearlings; and Priest Rapids FH, 5,000,000 subyearlings (2,360,000 yearlings and 7,104,000 subyearlings total).

Since yearling chinook salmon released from hatcheries survive at much higher rates than subyearlings (up to 15 times higher), fewer fish need to be propagated as yearlings to meet the compensation levels required under the second objective. In the short-term, this strategy appears to have fewer ecologic impacts to natural fish (although some indicators are inconclusive). However, the Hatchery Work Group recognized that this strategy, in combination with relatively high numbers of naturally spawning hatchery fish, may have deleterious long-term genetic effects to natural fish. This may be impossible to detect in a timely manner. Given these constraints, the chosen strategy is to continue to propagate yearlings to compensate for dam mortalities; evaluate the genetic, ecologic, and demographic characteristics of the natural populations throughout the hatchery program; and recognize the risk that potential impacts may not be detected in sufficient time to correct them. Additional production to compensate for hydropower losses are 750,000 yearlings on Wenatchee River, 150,000 yearlings on Entiat River, 150,000 yearlings on Chelan River, 120,000 yearlings on Methow River, 300,000 yearlings near Chief Joseph Dam, and 1,000,000 subyearlings at Priest Rapids FH (1,470,000 yearlings and 1,000,000 subyearlings total). Means to collect local broodstocks on the Methow and Okanogan river will be studied.

Spring chinook salmon

The co-managers concluded that many populations are at high risk of extinction, and artificial propagation was essential for their recovery. However, there was substantive debate on how to categorize and propagate the populations. Critical uncertainties were: (1) the level of population structure of mid-Columbia spring chinook salmon, (2) which strategies posed the least risk to the populations while having the highest likelihood of recovering them, and (3) whether these recovery measures were logistically feasible. The co-managers investigated several alternatives that could be used in the recovery process, while promoting within- and among-population genetic variability for the nominal populations. Some alternatives either presented an increased risk to the sustainability of the populations, or have low feasibility in implementation. As a result, the most appropriate plan included a limited use of many strategies to spread the overall risk to the populations and to test the effectiveness of each strategy. "Spreading the risk" includes the use of more than one artificial propagation strategy, collecting broodstock at more than one life stage, predetermined means to manage stray fish, variable levels of population separation, and designation of Areference@ populations that will not be artificially propagated. All strategies will be monitored to allow comparison of the effectiveness of each alternative and subsequently, adaptive management of the program.

Five nominal populations will be managed in the Wenatchee Watershed (Leavenworth, Chiwawa, Nason, White, and Little Wenatchee). The preferred strategy for the Leavenworth Population is to retain the current production objective (1,625,000 yearling smolts), yet modify the program to assist in natural fish recovery. This includes further integration with natural production, out planting into unseeded habitats within the Wenatchee Watershed, and discontinued imports of non-native broodstock. The preferred strategy for the Chiwawa Population is to reduce the production objective from 672,000 to 300,000

yearling smolts, which will more closely match the natural productivity of that stream. The Nason Creek and White River populations will be captively reared for two salmon generations (8 -10 years) to quickly increase their abundance, and then used to supplement those streams. The Little Wenatchee Population will not be artificially propagated at this time, to serve as a reference stream to compare recovery rates with those populations that are artificially propagated. Concurrently, a rigorous evaluation will be made of the reproductive success of hatchery and natural salmon in the natural environment in the Wenatchee Watershed.

The current hatchery production objective for the Entiat Population is to release 400,000 yearling and 400,000 subyearling smolts into lower Entiat River. This program has been based on use of both native and non-native populations. There is some evidence however that, because of several factors, these fish may be reproductively isolated from the potentially native natural spawners in that watershed. Given this uncertainty, the preferred strategy is to maintain the current program until the relation of Entiat FH fish and natural fish are determined. If the two groups appear to be reproductively integrated, the program will be modified to release up to 600,000 yearling smolts into lower Entiat River and outplant 200,000 yearling smolts in upper Entiat River. If the two groups are reproductively isolated, strategies may be developed to recover and conserve the natural population using methods other than artificial propagation. This population would then serve as a reference, similar to the Little Wenatchee Population.

The hatchery strategy for the Methow Population was developed after considering their historic and current population dynamics and genetic structure within the watershed. The preferred strategy is to continue the supplementation program at Methow FH (738,000 yearlings), based upon common native broodstock collected at Wells Dam, and to modify Winthrop FH into a supplementation program, similar to Methow FH. This will entail elimination of non-native fish from Winthrop FH, and further integration of hatchery and natural fish. Eventually, both hatcheries will work as a combined program. Winthrop FH will reduce production from 800,000 to 600,000 yearling smolts. Fish from the Twisp River will be captively reared as an adjunct to the supplementation program.

Steelhead

At this time, steelhead are at high risk of extinction, and artificial propagation is essential for their recovery. The current program for steelhead in the Mid-Columbia Region is based predominantly on a common broodstock collected at Wells Dam. Yearling progenies are reared at Wells, Turtle Rock, Chelan, and Eastbank FHs and scatter planted at several locations in the Wenatchee, Entiat, Methow, and Okanogan Rivers. This program will be modified to encourage a higher level of adaptation to these streams and reduce gene flow among watersheds.

The preferred strategy for Wenatchee River is to collect broodstock on that river for propagation and release there only; program size will remain at 360,000 yearlings. The preferred strategy for Entiat River is to continue use of Wells broodstock in the short term (program size is 40,000 yearlings), while simultaneously investigating the feasibility of either (1) collecting a local broodstock on that stream for supplementing that population or (2) using the Entiat population as a reference, to compare its viability with artificially propagated steelhead. If the first option is pursued, an evaluation of Ascatter-plant@ versus acclimated releases will be done. The preferred strategy for the near-term for the Methow River is to continue broodstock collection at Wells Dam, and to investigate the means to collect local broodstock on the Methow River for the long term (production objectives are 380,000 yearlings reared at Wells FH and 100,000 yearlings reared at Winthrop FH). The preferred strategy for the Okanogan River is to continue collections at Wells Dam while investigating means to develop a local population for broodstock

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(production objectives remain at 100,000 yearlings, reared at Wells FH).

Sockeye salmon

There are two populations of sockeye salmon in the Mid-Columbia Region, from the Wenatchee and Okanogan rivers. Both currently have low risk of extinction. The current production objectives are 200,000 yearlings from Wenatchee River, propagated at Eastbank FH, and 200,000 subyearlings from Okanogan River, propagated at Cassimer Bar FH. The programs acclimate fish with net pens on lakes Wenatchee and Osoyoos, respectively. Production will increase to approximately 725,000 fish of various ages on Wenatchee River and 2,200,000 fish of various ages on Okanogan River and the mainstem Columbia River upstream of Wells Dam. The number of each population to be produced, and the means to propagate them will depend on several factors outside the scope of this plan. Similar to that for summer and fall chinook salmon, hatchery production of sockeye salmon will be monitored to assess its effects on natural salmon, and to help guide the means to increase the production.

Coho salmon

At this time, coho salmon are extinct in the Mid-Columbia Region, and this plan will artificially propagate them only once natural populations are re-established. Coho salmon are being reintroduced to the region through processes outside the scope of this plan.

VI. Middle Columbia Region, Bonneville to Priest Rapids Dams

Table 4a. Middle Columbia Regional Summary (Washington)

Sub-basin	Species/ Status	Management Objectives * 1	2	3	Desired Results	Proposed Actions
Wind River	Spring Chinook not native to river			X	Maximize terminal fishery opportunity for sport and tribal fishers. Provide rearing space for short term re-introduction efforts elsewhere in Region.	Current programed release of 1.4 M to support terminal fishery. Use in basin facility and/or Carson stock for short term re-introduction elsewhere in Region (see Big White and Walla Walla Rivers).
	Fall Chinook native tule stock is depressed and declining. URB-s are colonizing.	d			Preserve and rebuild native Tule stock to healthy levels through natural processes.	Short term: current program (no hatchery release). Assess reasons for tule stock decline such as URB colonization and habitat problems. Assess potential to maintain Bon. Pool at minimum level to maximize spawning habitat. Long term: one generation hatchery boost using Spring Creek Hatchery if population continues to decline and URB colonization is not the cause.
	Summer steelhead depressed and	d			Preserve and rebuild the native population to healthy levels through natural processes.	Major habitat problems. First priority should be to improve degraded habitat.

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish, c. Enhancement - restricted use of hatchery fish, d. No immediate action
2) Re-introduction into historic habitat
3) Fishery augmentation program

Sub-basin	Species/ Status	Management Objectives * 1	2	3	Desired Results	Proposed Actions
	declining				Provide fishery opportunities.	No planned hatchery program in short term. Hatchery intervention only if needed to prevent extinction. Continue selective harvest on upper Col. Basin Adip-in@ hatchery fish.
	Winter steelhead depressed and declining	d			Preserve and rebuild native population to healthy levels through natural processes.	Same as for summer steehead except no targeted fishery on hatchery fish.
Little White Salmon River	Spring Chinook not native to river			X	Maximize terminal fishing opportunity on returning hatchery fish.	Current release of 1.0 M (Carson derived stock) at Little White Salmon Hatchery (LWSH). Continue to rear 0.35 M for Umatilla River re-introduction (see Umatilla River). Assess the need for using for short term reintroduction efforts elsewhere in region.
	Fall Chinook native stock is extinct. URB hatchery stock			X	Maximize fishery opportunity and contribution. Promote development of selective fishing gear for tribal fishers to	Historical habitat is inundated by Bon. Pool. Impassable falls near river mouth. Native stock to area was tule.

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish, c. Enhancement - restricted use of hatchery fish, d. No immediate action
2) Re-introduction into historic habitat
3) Fishery augmentation program

Sub-basin	Species/ Status	Management Objectives * 1	2	3	Desired Results	Proposed Actions
	is healthy				protect wild steelhead.	Continue 2.0 M URB on station release from LWSH. Assess effects of URB strays on nearby natural spawning tule fall chinook and adjust program as needed.
	Summer Steelhead not native to river			X	Maximize selective fishery on Adip-in@ hatchery fish.	Current program of no hatchery releases. Up-river stocks use as cool water refuge in summer with targeted selective sport fishery on Adip-in@ hatchery fish. Promote development of selective fishing gear for Tribal fishers.
	Coho Salmon not native to river			X	Maximize selective and terminal fishery.	Current release of 2.0 M with mass mark for selective fishery. Potential selective fishery should be consistent with coast-wide mark policies. Assess the need for reprogramming production for other tribal re-introduction efforts in upper Col. Basin areas. Broodstock collection would need to transition to these areas.

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish, c. Enhancement - restricted use of hatchery fish, d. No immediate action
2) Re-introduction into historic habitat
3) Fishery augmentation program

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Sub-basin	Species/ Status	Management Objectives * 1	2	3	Desired Results	Proposed Actions
Lower main-stem Columbia River	Spring Creek Hat. Fall chinook derived from Big White River fish			X	Maximize fishery benefits. Important contributor to Canada and U.S. ocean fishery. Use for re-introduction and enhancement efforts for tule stock in Region.	Current 15.0 M release from Spring Creek Hatchery, but consider releasing 4.0 M of these fish from Bonneville Hat. to provide a second broodstock collection site for this stock.
Big White Salmon River	Spring Chinook native stock is extinct.		X	X	Provide terminal area fishing opportunity. Establish viable natural population in upper river when Condit Dam is removed.	Current release of 0.15 M yearlings in April and 0.35 M sub-yearling August release. Carson stock currently used. Assess and define appropriate stock for reintroduction in upper river (consider Klickitat or Carson as donor source). Initiate 1-2 generation reintroduction program. Harvest program may need to be put on hold or transition to selective fishery when re-introduction program begins.
	Fall Chinook	d	X		Establish and maintain healthy	Manage for natural production in

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish, c. Enhancement - restricted use of hatchery fish, d. No immediate action
2) Re-introduction into historic habitat
3) Fishery augmentation program

Sub-basin	Species/ Status	Management Objectives * 1	2	3	Desired Results	Proposed Actions
	native tule stock is depressed, URBs colonizing				native tule population. Expand current used habitat to upper watershed when Condit Dam removed.	near term. Re-introduce into upper river using Spring Creek Hatchery stock (derived from Big White) when Condit Dam is removed (1-2 generation program). Assess the effects of URB colonization on native tule stock and adjust program as needed.
	Summer steelhead unknown, thought to be very depressed	d	X		Re-establish natural population in upper watershed when Condit Dam removed. Maintain selective fishery opportunity on marked hatchery fish.	Assess genetic characterization of native fish. Continue current program of no hatchery releases. Target selective fishery on upper Col. Basin Adip-in@ hatchery fish.
	Winter steelhead unknown, thought to be very depressed	c	X	X	Preserve native population. Re-establish natural population in upper watershed once Condit Dam removed. Promote selective fishery on marked hatchery fish.	Assess genetic characterization of native fish. Transition to a local broodstock in the near term and re-establish a naturally spawning population in upper watershed after Condit Dam removed (1-2 generation program). Mark for selective fishery (0.04 M).
	Coho Salmon		X		Re-establish natural population in watershed when Condit Dam	Assess appropriate stock for re-introduction. Assess the potential

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish, c. Enhancement - restricted use of hatchery fish, d. No immediate action
2) Re-introduction into historic habitat
3) Fishery augmentation program

Sub-basin	Species/ Status	Management Objectives * 1	2	3	Desired Results	Proposed Actions
	extinct				remove.	for providing space at Willard Hatchery or other facility for re-introduction into basin for short 1-2 generation period.
Klickitat River	Spring Chinook depressed	c		X	Increase escapement of naturally produced fish to healthy level. Promote selective fishery on marked hatchery fish to provide protection for natural fish.	Current program of 0.6 M yearlings. Mark all or the portion of fish targeted for selective fishery consistent with coast-wide mark polices. Discontinue 1.2 M sub-yearling release. Continue YKFP supplementation planning process and assess the potential for implementation once program is defined. Could produce smolts for supplementation if coho program reduced or additional off-site facilities used (see coho below).
	Fall Chinook not native to river			X	Maximize terminal fishery opportunities for tribal and sport fishers. Control and/or prevent straying into natural production areas of the	Current 4.0 M release into basin for terminal fishery. Tag all fish to be released to allow trap and removal of stray adults at Lower Granite Dam. Assess cause of straying.

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish, c. Enhancement - restricted use of hatchery fish, d. No immediate action
2) Re-introduction into historic habitat
3) Fishery augmentation program

Sub-basin	Species/ Status	Management Objectives * 1	2	3	Desired Results	Proposed Actions
					Snake River.	
	Summer steelhead unknown, but thought to be depressed			X	Increase natural population to healthy levels. Provide selective fishery opportunity within the Sub-basin consistent with coast-wide mark policies.	Transition current 0.12 M program from Skamania stock to locally derived Klickitat River stock consistent with coast wide mark policies. Mark and target for selective fishery. Assess feasibility of in-basin rearing facility for program. Assess the potential for YKFP supplementation action once proposed program is identified.
	Winter steelhead unknown, but thought to be depressed	d			Increase natural population to healthy level. This is upper limit for winter steelhead in Washington.	Continue and expand habitat restoration activities in basin (also applies for summer steelhead). Manage for natural production and intervene only to prevent extinction.
	Coho salmon not native to river			X	Maximize within basin terminal fishery and selective fisheries in ocean and Columbia River. Minimize impacts on native populations	Continue current release of 3.8 M (1.3 M currently occurs at Klickitat Hatchery, remaining from lower river hatcheries). Mark target hatchery fish for selective fishery consistent with coast-wide mark policies. Look at reducing coho

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish, c. Enhancement - restricted use of hatchery fish, d. No immediate action
2) Re-introduction into historic habitat
3) Fishery augmentation program

Sub-basin	Species/ Status	Management Objectives * 1	2	3	Desired Results	Proposed Actions
						program to produce additional spring chinook.
Yakima River	Spring chinook depressed, but stable	b		X	Increase natural population to healthy self-sustaining level. Provide fishery opportunity.	Priority for program is rebuilding natural population and then providing fishing opportunity on hatchery fish. Near term: follow YKFP plan of .810 M release (all marked). Long term: adjust YKFP program based on evaluation results.
	Summer chinook extinct		X		Establish natural population once habitat problems are addressed.	Improve habitat in lower and middle sections of river.
	Coho salmon extinct		X		Re-establish natural population in the basin.	Continue re-introduction program of 0.7 M smolts and 0.4 M parr release. Transition broodstock collection to within the basin to promote local adaption. Juvenile releases should not be marked for selective fishery in near term. Monitor program and adjust as needed.

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish, c. Enhancement - restricted use of hatchery fish, d. No immediate action
2) Re-introduction into historic habitat
3) Fishery augmentation program

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Sub-basin	Species/ Status	Management Objectives * 1	2	3	Desired Results	Proposed Actions
	Sockeye salmon extinct		X		Re-establish natural population in the basin.	Significant habitat problems make it unlikely that sockeye can be re-introduced into basin in foreseeable future. Wenatchee stock would be likely donor stock.
Hanford Reach, Columbia River	Spring chinook not native to river			X	Provide selective fishery opportunity.	Current program of 1.0 M release from Ringold. Mark and target for selective fishery consistent with coast-wide mark policies. use of Ringold stock for local re-introduction programs such as Walla Walla River.
	Fall Chinook healthy, harvestable surplus	d		X	Maintain healthy native population in Hanford Reach. Provide harvest opportunities consistent with natural production constraints.	Current program of 10.2 M released from Priest Rapids Hat. (6.7 M) and Ringold (3.5 M). Develop harvest opportunities to take advantage of surplus hatchery production or scale program consistent with natural production objectives..

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish, c. Enhancement - restricted use of hatchery fish, d. No immediate action
2) Re-introduction into historic habitat
3) Fishery augmentation program

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Sub-basin	Species/ Status	Management Objectives * 1	2	3	Desired Results	Proposed Actions
	Summer steelhead unknown, historically thought to be lightly used.	d		X	Develop egg bank program at Ringold facility to act as reserve. Provide selective fishing opportunity on surplus hatchery fish.	Continue transitioning broodstock to upper Columbia River Wells stock (0.18 M release). Mark all hatchery fish.

Management Objectives:
1) Conservation of genetic resources; a. Preservation, b. Enhancement - unrestricted use of hatchery fish, c. Enhancement - restricted use of hatchery fish, d. No immediate action
2) Re-introduction into historic habitat
3) Fishery augmentation program

Table 4b. Middle Columbia Regional Summary (Oregon)

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
Walla Walla River	Spring Chinook - endemic population is extinct.		X	X	Reintroduce species to historically available habitat using appropriate stock. Provide tribal and sport fisheries within the watershed.	1) continue development of hatchery master plan for reintroduction program, 2) support development of facilities in South Fork Walla Walla River and acquire appropriate broodstock (Carson stock?/Umatilla?/Ringold?) 3) pending plan, produce 350K yearlings for reintroduction into South Fork
	Summer Steelhead depressed and proposed for listing.	C		X	Conserve existing endemic population and provide for tribal and sport fisheries.	1) phase out release of LF/Wells stock, 2) phase in use of endemic stock for hatchery production, 3) assess need for and potential reduction of 300K yearling LSRCP release numbers to achieve harvest augmentation adult return goal, 4) support continued development of Walla Walla River hatchery master plan, 5) manage returns to accomplish multiple goals of natural stock rebuilding and selective fishing.
Umatilla River	Spring Chinook-endemic population		X	X	Reintroduce species to historically available habitat using appropriate stock.	1) continue implementation of Umatilla hatchery master plan, 2) make adaptive management changes, implementing

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	extinct. Reintroduction effort since 1986.				Provide tribal and sport fisheries within the watershed.	results of monitoring and evaluation (support increasing current production from 860K to 1.4 million if construction of new South Fork Walla Walla facility), 3) utilize returning fish to Umatilla River for broodstock.
Umatilla River	Fall Chinook-endemic population extinct. Reintroduction effort since 1982.		X	X	Reintroduce species to historically available habitat using appropriate stock. Provide tribal and sport fisheries within the watershed.	1) continue implementation of Umatilla hatchery master plan, 2) make adaptive management changes, implementing results of monitoring and evaluation (use up to 1,000 adult outplants from Priest Rapids/Ringold, maintain 480K yearling program at Bonneville hatchery but consider reduction on subyearling release of 2.7 million at Umatilla hatchery), 3)utilize returning adults to Umatilla River for broodstock .
Umatilla River	Summer Steelhead Moderately depressed with no immediate risk of extinction.	B		X	Supplementation program to boost natural production and provide for harvest opportunity.	1) continue utilizing endemic stock for supplementation, 2) continue implementation of Umatilla hatchery master plan (150K yearling), 3) make adaptive management changes, implementing results of monitoring and evaluation (consider reducing adult production goal), 4) manage returns to accomplish multiple

Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						goals of natural stock rebuilding and selective fishing.
Umatilla River	Coho-endemic population extinct. Reintroduction effort since 1987.		X	X	Reintroduce species to historically available habitat using appropriate stock. Provide tribal and sport fisheries within the watershed.	1) utilize Umatilla River returning adults for broodstock, 2) continue 1.5 million yearling production for Umatilla River.
John Day River	Spring Chinook-depressed with no immediate risk of extinction.	D			Conserve healthiest run of wild spring chinook salmon remaining in Columbia River basin.	1)manage for wild fish to allow natural processes to occur with no hatchery intervention, 2) continue habitat enhancement projects, 3) develop wild fish refuges.
John Day River	Summer steelhead depressed with no immediate risk of extinction	D			Conserve wild production and provide fishery.	1)manage for wild fish to allow natural processes to occur with no hatchery intervention, 2) continue habitat enhancement projects, 3) develop wild fish refuges.
Deschutes River	Spring Chinook-depressed, long-term decline	C		X	Conserve wild fish population in Warm Springs River. Maintain genetic	1) maintain current yearling production program at Round Butte state fish hatchery (320K) and Warm Springs

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Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	with no immediate risk of extinction				characteristics of endemic stock in both the stream and hatchery environment. Produce fish for tribal and sport harvest with hatchery program.	National Fish Hatchery (750K) using endemic stock, 2) continue implementation of Deschutes River Management Plan, 3) investigate reintroduction of fish upstream of dams @ rivermile 100.
Deschutes River	Fall Chinook-healthy with recent trend upward	D			Conserve wild production and provide fishery.	1)manage for wild fish to allow natural processes to occur with no hatchery intervention, 2) continue habitat enhancement projects, 3) continue implementation of Deschutes River Management Plan to manage population and fishery.
Deschutes River	Summer Steelhead depressed, long-term declining trend	C		X	Conserve existing endemic population. Utilize historically available habitat. Minimize impact from out of basin (Snake River) strays. Provide for tribal and sport fisheries with hatchery program using endemic stock.	1) maintain current production program at Round Butte state fish hatchery (162K yearling) using endemic stock, 2) continue implementation of Deschutes River Management Plan, 3) investigate reintroduction of fish upstream of dams @ rivermile 100 4) implement actions to reduce straying (modify Snake River program), 5) manage returns to accomplish multiple goals of natural stock rebuilding and selective fishing.

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Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
Deschutes River	Sockeye-functionally extinct as a result of dams at RM100		X		Reintroduce using appropriate broodstock into historically available habitat.	1) develop reintroduction plan , 2) implement actions as appropriate from planning.
Fifteenmile Creek	Winter Steelhead-depressed and declining	D			Conserve wild production.	1)manage for wild fish to allow natural processes to occur with no hatchery intervention, 2) continue habitat enhancement projects
Hood River	Spring Chinook-endemic population is extinct. Reintroduction program began in 1986.		X	X	Reintroduce species to historically available habitat using appropriate stock. Provide tribal and sport fisheries within the watershed.	1)follow and implement Hood River hatchery master plan (125K near-term to 250K long-term yearling production goal), 2) utilize Deschutes River stock and Deschutes River and Hood River facilities to implement program. 3) utilize Hood River returning adults for broodstock.
Hood River	Summer steelhead depressed at very low level	C		X	Conserve existing endemic population, supplement with endemic hatchery program, and provide for tribal and sport fisheries.	1) implement Hood River hatchery master plan utilizing endemic stock (phase in 150K yearling program), 2) phase out release of 60K yearling Skamania stock, 3) manage returns to accomplish multiple goals of natural stock rebuilding and

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Sub-basin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						selective fishing.
Hood River	Winter Steelhead-depressed	C		X	Conserve existing endemic population, supplement with endemic hatchery program, and provide for tribal and sport fisheries.	1) implement Hood River hatchery master plan utilizing endemic stock (50K near-term to 85K long-term yearling production goal), 2) manage returns to accomplish multiple goals of natural stock rebuilding and selective fishing.

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Summary of Proposed Federal Actions for Mid-Columbia River Region

Wind River

Spring Chinook

Status: Carson stock is an introduced spring chinook stock to the basin that historically had no native spring chinook populations. Natural habitat is generally believed to be more conductive to steelhead production than spring chinook production. Goal: Continue to maximize opportunity for terminal area known stock tribal and non-tribal fisheries and provide rearing space capacity for short term re-introduction/supplementation efforts using Carson stock. Proposed actions: Maintain current hatchery program of 1.4M station release at the recommended low density level, 100K for Umatilla River re-introduction program, and egg collection for the Big White Salmon Ponds program. The on-station release program provides known stock terminal fishery opportunity for tribal and non-tribal fisheries at the river mouth and lower section of the river. Consider short term reduction in on-station releases to provide Carson stock for other re-introduction programs for mid-Columbia River sub-basins (e.g., South Fork Walla Walla and Big White Salmon after Condit Dam removal, etc.). Discontinue the 100K Umatilla River re-introduction program after the South Fork Walla Walla facility is completed.

Fall Chinook

Status: Native tule stock is depressed and declining. The natural production area for fall chinook is very limited with production primarily occurring below Shipperd Falls in the lower river section. The filling of Bonneville Pool in 1938 inundated a significant portion of the historical tule fall chinook spawning and rearing area. URB strays from local area hatchery releases are colonizing the available tule stock habitat area and may be contributing to the tule stock decline by excavating tule redds because of their later spawning time and because of the limited spawning area. No hatchery fall chinook are currently released in the system. Goal: Preserve and rebuild natural tule fall chinook population through natural processes. Proposed actions: Short term: Investigate the cause of tule stock decline (whether from habitat degradation or URB colonization related). Operate Bonneville Pool at minimum pool operating level during the tule fall chinook spawning period to maximize available spawning area. Maintain current program of no hatchery releases given the low production potential and other species emphasis in the basin. Long term: Potential for a limited short term (one generation) supplementation boost with Spring Creek stock if tule stock decline continues and URB colonization is not the cause.

Steelhead

Status: Native winter and summer steelhead runs are depressed and declining. Habitat degradation appears to be a significant cause for decline. Historical hatchery releases have been 40-100K Skamania summer stock steelhead (non-endemic stock). Skamania stock releases

ended in 1997. Goal: Preserve and rebuild the native populations through natural processes. and manage for natural fish production preferably without hatchery intervention of the local native stock. Preventing the extinction of the native steelhead stock(s) should be the primary management emphasis in the basin. Proposed actions: Short term: Manage for natural fish production. Maintain current status of no further hatchery program in the near term. Implement aggressive habitat restoration effort and continue to monitor runs. With only one dam to pass, the natural steelhead populations should be able to recover if the major habitat issues are addressed. It is unlikely that supplementation efforts would be successful without correction of the habitat problems. Continue selective harvest of Adip-in@ hatchery fish at river mouth. Long term: If runs continue to decline to very low levels, collect local broodstock at Shipperd Falls or some other upriver spawning area locations for a potential limited short term (one generation) supplementation boost. Facility space would need to be identified to accommodate the local supplementation program. Carson NFH is an obvious candidate.

Little White Salmon River

Spring Chinook

Status: LWS stock is an introduced stock (derived from Carson stock) to the basin that historically had no native spring chinook populations. An impassable falls near the river mouth blocks access to the upper basin. Goal: Continue to maximize opportunity for terminal area known stock tribal and non-tribal fisheries and provide rearing space capacity for short term re-introduction/supplementation efforts using Carson/LWS stock. Proposed actions: Continue the current hatchery program of 1.0M on-station release and 350K for Umatilla River re-introduction program. Station release provides known stock terminal harvest opportunity for tribal and non-tribal fisheries in Drano Lake at the river mouth. Potential use of the facility as a rearing station for other mid-Columbia River region spring chinook re-introduction programs that would use Carson/LWS stock. This would require realignment of the current rearing regime (e.g., reduction of on-station spring chinook release and/or URB program).

Fall Chinook

Status: There is currently no accessible natural habitat for fall chinook in this system. The filling of Bonneville Pool in 1938 essentially inundated all of the historically available tule fall chinook spawning habitat in the lower end of this system. An impassable falls near the river mouth blocks access to the upper basin. LWS NFH historically raised tule stock fall chinook but because of chronic low returns converted to URBs in the mid-1980s. On-station releases provide known stock terminal fishery opportunities for tribal and non-tribal fisheries and contribute to mixed stock ocean and in river fisheries. Goal: Maintain URB broodstock, continue to maximize opportunity for known stock terminal area fisheries and other mixed stock fisheries, and provide rearing capacity for short term re-introduction/supplementation efforts using URB stock. Proposed actions: Short term: Maintain 2.0M on-station URB release and 1.7M URB

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Yakima River re-introduction program release. Promote development of live capture techniques for tribal fisheries in Drano Lake to take advantage of surplus hatchery URBs, hatchery steelhead, and hatchery coho, with release of wild steelhead. Long term: Consider transfer of URB John Day Mitigation to other upriver areas but only if adequate facilities are developed and overall production in upper river areas is consistent with harvest and natural production constraints. This may require development of live capture techniques in upper river areas also.

Steelhead

Status: Steelhead are not native to the Little White Salmon River. Access to the upper basin is blocked by an impassable falls near the river mouth just above LWS NFH. Significant numbers of hatchery and wild steelhead destined for other upriver areas enter Drano Lake (mouth of Little White Salmon River) during the summer and fall months seeking cool water refuge from high mainstem Columbia River water temperatures. These Adip-in@ steelhead are of mixed stock origin and typically exit Drano Lake in late September/early October when Columbia River water temperatures moderate. Steelhead entering this area provide opportunity for a terminal area harvest of hatchery steelhead (assuming live capture selective techniques are used) while other stocks of concern are passing upstream (i.e., sockeye, Snake River summer and fall chinook). Goal: Provide a mechanism for the tribes to harvest a portion of their steelhead allocation by targeting Adip-in@ hatchery steelhead in this terminal area. Proposed actions: Maintain the program of no steelhead releases at LWS NFH. Assist the tribes in the development of live capture techniques (e.g., fish wheels, traps, etc.) for tribal fisheries to provide added opportunity to harvest surplus hatchery steelhead. Live capture techniques would likely have application in several other cool water refuge locations such as the mouth of the Wind, Big White Salmon, and Deschutes rivers, and the mouth of Herman Creek.

Coho

Status: Coho are not native to the Little White Salmon River. Access was blocked by an impassable falls near the mouth of the river. Early (Toutle) stock coho have been reared and released from the LWS/Willard NFH complex for many years. Returning coho provide a known stock terminal fishery opportunity for tribal and non-tribal fisheries in Drano Lake at the river mouth, although the tribes have not exercised that opportunity to a great extent as yet. The current program is 2.5M smolts with 2.0M (marked) released on-station and 0.5M transferred to the Clearwater River system for a re-introduction program in the Snake River Basin. Nursery rearing space at Willard NFH is a concern at the 2.5M level and the FWS may opt to rear the 0.5M Clearwater River program at another facility such as Eagle Creek NFH in the future. Goal: Continue to provide known stock fishery opportunities in the terminal area and selective fishery opportunities in mixed stock areas consistent with coast-wide mark policies. Proposed actions: Short term: Maintain current program with flexibility to address the nursery rearing density concern at Willard NFH. Long term: Potential for use of the Willard facility as a rearing station for other existing or new coho re-introduction programs. This would result in reduction of on-

station releases, reduction in terminal fisheries opportunities, and the need to rely on local broodstock collection for these programs. Transition to local broodstock collection for all re-introduction programs is strongly encouraged.

Lower Mainstem Columbia River

Spring Creek NFH Fall Chinook

Status: The Spring Creek NFH stock was derived from Big White Salmon River native stock and represents the most productive and genetically pure tule stock in the Columbia River. Spring Creek tule stock is a very important stock for ocean fisheries and weighs heavily in the U.S./Canada fishery negotiations as one of the original index stocks for ocean exploitation analysis. Goal: Maintain unique tule stock for future re-introduction/supplementation efforts and manage to maximize fishery benefits. Proposed actions: Maintain 15.0M tule program at Spring Creek but initiate a rearing and/or acclimated release of up to 4.0M of the program smolts at Bonneville Hatchery to provide a second broodstock collection site. Bonneville Hatchery phased out of their tule program in 1995 so returns after 1999 could be collected as Spring Creek stock. Manage the two facilities as sister stations with egg collection at both facilities, early rearing at Spring Creek NFH, and final rearing/acclimated release of up to 4.0M at Bonneville Hatchery. This strategy would provide added protection for stock preservation in the unfortunate event of catastrophic loss at a single facility and would provide added flexibility for broodstock collection to achieve the 7000 adult (4000 female) escapement goal. Develop a program a use Spring Creek tule stock for fall chinook re-introduction in the Big White Salmon River after Condit Dam removal.

Big White Salmon River

Spring Chinook

Status: Native spring chinook were extirpated by the construction of Condit Dam. Goal: Continue to provide known stock terminal fishery opportunity in the short term and establish a naturally spawning population in the basin by re-introducing an appropriate stock of spring chinook into the upper basin after Condit Dam removal. Proposed actions: Maintain current program of 150K April smolt release and 350K August presmolt release of Carson/LWS stock from Big White Salmon Ponds below Condit Dam in the short term. These releases provide known stock terminal fishery opportunities for tribal and non-tribal fisheries. Develop a plan that re-introduces Klickitat stock as a first option or Carson stock as a second option into upper watershed after Condit Dam removal. Hatchery re-introduction program should initially be planned as a one to two generation intervention strategy and monitored for results. Current terminal fishery harvest program may need to be put on hold or transitioned to a selective fishery when the re-introduction program begins.

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Fall Chinook

Status: Current natural production area is limited to three mile section of river below Condit Dam. The naturally spawning tule stock, which is probably heavily influenced by a long history of Spring Creek stocking in the lower Big White Salmon River, is depressed and may be affected by colonizing URB stock which is currently stable. Later spawning URBs may again be excavating the tule redds as appears to be the case in the Wind River. Currently, no hatchery fall chinook are released in the Big White Salmon River. Goal: Manage for natural production and re-establish a naturally spawning tule population in the upper basin after Condit Dam removal. Proposed actions: Implement a re-introduction program with Spring Creek tule stock after Condit Dam is removed. Start with a one to two generation supplementation program and monitor results. Continue to monitor the colonization of URBs in the basin.

Steelhead

Status: Summer and winter steelhead are native to this system although available spawning habitat is very limited (three mile section below Condit Dam). Natural stock abundance is unknown but is assumed to be very depressed given the available natural production area and general decline of all natural steelhead populations. Genetic characterization of the natural stock is unknown but is likely heavily influenced by a long term history of Skamania stock steelhead plants in the system and because of the very limited natural production area. Current hatchery program is release of 40K Skamania stock winter steelhead (non-endemic stock). Goal: Re-establish a naturally spawning population in the upper basin after Condit Dam removal. Maintain selective fishery on Adip-in@ hatchery steelhead at the river mouth in the near term. Proposed actions: Short term: Transition to local broodstock. Determine abundance and genetic characterization of the current naturally spawning population. If the natural stock is still viable and not significantly compromised from the Skamania Hatchery plants, transition to local broodstock through a local broodstock collection program. If natural stock has been compromised and/or is extremely low (most likely scenario), transition to next closest endemic stock (most likely Klickitat stock). This will require a local broodstock development program for Klickitat River also. Mark a portion of hatchery releases for secondary selective fishery purposes and manage terminal area for selective harvest of hatchery steelhead. Longer term: Develop re-introduction program for the Big White Salmon River that uses the appropriate local broodstock described above and implement program after Condit Dam removal. Initiate re-introduction program with a one to two generation hatchery intervention strategy and monitor results.

Coho

Status: Condit Dam blocks upper basin access to all anadromous salmonid populations in the Big White Salmon River. There are currently no hatchery releases of coho in the system. Goal: Re-establish a naturally spawning coho population after Condit Dam removal. Proposed Actions: Evaluate the habitat capacity for coho in the upper basin and develop a re-introduction

program for the basin and implement upon Condit Dam removal. Klickitat late stock and Little White Salmon early stock coho are the logical candidates for the re-introduction program. Initiate program with a one to two generation hatchery intervention strategy and monitor results. Potential for providing Willard NFH rearing space to initiate the re-introduction program.

Klickitat River

Spring Chinook

Status: Natural spring chinook run is depressed. Goal: Maintain native stock integrity, provide terminal area harvest opportunity, and enhance natural production in the upper basin. Proposed actions: Short term: Continue and expand habitat restoration actions. Discontinue the subyearling release and maintain the 600K smolt release at Klickitat Hatchery but rear at reduced densities if possible. Mark all or the portion of hatchery fish targeted for selective fishery to protect natural spawning population. Consider increasing the 600K smolt program if in-basin coho rearing program is reduced or transferred out of basin. Support continued development of YKFP supplementation planning process. Long Term: Defer to YKFP supplementation program once it is defined.

Fall Chinook

Status: Fall chinook are not native the Klickitat River basin. An early naturally spawning Afall@ stock has persisted and is stable. This stock aligns genetically more closely to upriver summer/fall chinook and may in fact be a summer run stock rather than a Atule@ type fall chinook stock which had been the previous management assumption. Klickitat Hatchery originally raised 4.0M tule stock fall chinook from multiple broodstock origins (most from Spring Creek). The fall chinook program was converted to URBs in the late 1980s and supplies fish for known stock terminal area tribal and non-tribal fisheries and mixed stock ocean and inriver fisheries. Passive supplementation is occurring with URBs colonizing in the 40 mile stretch of the river below the hatchery. URB broodstock are currently not collected in the basin with the hatchery relying on other broodstock sources (Priest Rapids, Bonneville, LWS) for its eggs. Goal: Continue to maximize terminal fishery opportunity but address the Klickitat stray issue in the Snake River. Maintain the early naturally spawning Afall@ chinook stock. Proposed action: Short term: Continue 4.0M program release from Klickitat Hatchery but conduct early rearing and marking of 3.2M of the program at alternate production sites. This would free up some space to improve the spring chinook yearling program (see spring chinook section) and accommodate expanded fall chinook marking for straying management which currently can not be completed on-site. Mark 100% Klickitat fall chinook releases (most with BWT) to address the Snake River straying issue. Maintain the current hatchery status (no program) for the early spawning natural stock but continue to monitor status of the stock. Long term: Further investigate the cause of Klickitat fall chinook straying and whether straying into the Snake River is deleterious to the Snake River naturally spawning population. Discontinue 100% marking if/when straying issues are resolved.

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Steelhead

Status: Summer and winter steelhead are native to the Klickitat River. Stock status is unknown but assumed to be depressed based on stock status in surrounding drainages. The current hatchery program is 100-120K Skamania stock released in the lower river for fishery augmentation purposes. Goal: Develop local broodstock for dual purpose of providing the appropriate broodstock for enhancement activities in the basin and to provide harvest opportunity. Proposed actions: Short term: Continue and expand habitat restoration program, including addressing passage issues at Castille Falls. Transition from Skamania stock to local broodstock and rear and release at Klickitat Hatchery. Releasing local broodstock at the hatchery may provide for passive supplementation in the lower section of the river as is now occurring for URB fall chinook. Mark all or a portion of hatchery fish targeted for selective harvest to protect naturally spawning population. Longer term: Assess specific supplementation proposals as they are developed by the co-managers or through the YKFP supplementation planning program.

Coho

Status: Coho were not native to the Klickitat River system but have been introduced into the system. The Klickitat River has a long history of early and late stock coho releases with most of the recent releases being late stock. The current program is 3.8M release (marked) with 1.3M reared and released at Klickitat Hatchery and 2.5M transferred from lower river facilities (mostly Washougal). Broodstock is not collected in the Klickitat River system and returning fish are targeted for tribal and non-tribal terminal area fisheries. Goal: Maximize terminal and selective fishery opportunities consistent with coast-wide mark policies. Proposed actions: Short term: Continue current release levels. Provide acclimation for transferred coho to the extent possible. Long term: Develop acclimation and/rearing facilities in-basin to accommodate the current program release levels and develop local broodstock collection capability. Transition to program relying on local broodstock collection. Consider reduction of coho program or additional off station coho rearing to allow expansion of spring chinook program.

<u>Yakima River</u>

Spring & Summer Chinook

Status: Native spring chinook are depressed but stable. Summer chinook are extinct. Goal: Rebuild natural stocks within the Yakima basin consistent with YKFP planning process. Provide harvest opportunity consistent with YKFP goals. Proposed actions: Short term: Continue major habitat restoration effort. Proceed with current YKFP spring chinook supplementation program using local broodstocks to build to 810K planned release program and evaluate program. Long term: Base future YKFP program on results of the initial 810K YKFP program releases. Re-introduce summer chinook into system with an appropriate stock following habitat restoration.

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Wenatchee stock is a likely candidate. Develop summer chinook release numbers that are appropriate for the available restored habitat.

Fall Chinook

Status: Origin of the naturally spawning stock is unknown but it is probably part of the Hanford Reach metapopulation. Total return is increasing. Current program is an annual release of 1.7M URB smolts with early rearing at LWS NFH and final rearing and acclimated release at Prosser. Marion Drain population is currently managed as a wild fish area. Goal: Rebuild natural stocks in the Yakima basin consistent with YKFP planning process and provide in-basin terminal fishery opportunity. Proposed actions: Continue efforts to improve habitat quality. Maintain current program release levels from LWS NFH, follow YKFP supplementation program, and monitor and evaluate results in the short term. Phase into in-basin collection of local broodstock as soon as possible. LWS NFH could still provide early rearing capacity. Maintain the integrity of the stock currently spawning in Marion Drain.

Steelhead

Status: Summer steelhead are depressed and declining in the Yakima River. Most of the natural habitat for steelhead occurs in the lower river tributaries of Satus and Toppenish Creeks. Habitat degradation is a major problem in the basin for all salmonid populations. There are currently no hatchery production programs in the basin. Goal: Rebuild native Yakima steelhead run consistent with YKFP planning process. Proposed actions: Continue the no hatchery program in the short term and continue to address the major habitat issues (flows, passage, high water temperatures, etc.). Long term: Evaluate the available habitat and potential for success of a re-introduction program into the upper basin using local broodstock and develop plans through the YKFP supplementation planning process. Defer future implementation actions to the YKFP process.

Coho

Status: Coho were native and abundant in the Yakima River system, historically, but were extirpated with early basin development like all other upriver coho runs. A coho re-introduction program is underway in the Yakima River. The current program is 0.7M early stock coho smolts transferred from Cascade Hatchery and 0.4M early stock coho subyearlings transferred from Eagle Creek NFH. Goal: Re-establish a naturally spawning population of coho in the Yakima basin through a re-introduction strategy consistent with the YKFP planning process. Proposed actions: Short term: Continue current re-introduction program levels. Develop acclimation facilities for all current transfers and phase into local broodstock collection program. Longer term: Proceed with expanded supplementation program as plans are developed and agreed to under the YKFP planning process.

Sockeye

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Status: Sockeye were native to the Yakima River system but were extirpated by early basin development. There is no current program for sockeye in the Yakima River. Goal: Re-establish a naturally spawning population of sockeye in the Yakima basin using appropriate broodstock. Proposed actions: Short term: Evaluate habitat capability for sockeye. Re-introduce sockeye into suitable habitat in the upper basin for natural production using an appropriate stock. Wenatchee or Okanagan stocks are likely candidates. Habitat issues and passage through dams at upstream reservoirs need to be addressed before the re-introduction program likely will be successful.

Hanford Reach

Spring Chinook

Status: Historically, spring chinook were not native to this mainstem area. Currently, 1.0M spring chinook smolts are released at Ringold Hatchery for fishery augmentation purposes. Broodstock is from a mixed stock origin but has been dominated by Carson stock. Locally returning fish have been used for broodstock for 2-3 generations. Goal: Use Ringold facility for providing selective fishery opportunities. In addition, this stock may be becoming a locally adapted Carson derivative stock for Aupper end@ mid-Columbia River region and may be a canidate stock for regional re-introduction/supplementation programs (e.g., Walla Walla). Proposed actions: Continue local broodstock collection. Assess use of the locally adapted Ringold stock for re-introduction efforts (Walla Walla River). Mark all of the hatchery production for selective fisheries in the terminal area surrounding the Ringold facility. Manage selective fisheries to achieve local broodstock collection goal.

Fall Chinook

Status: The native run returning to this natural production area is healthy and provides significant benefits to a multitude of ocean and in river fisheries. The native run which provides the majority of the returning fish is supplemented by several hatchery programs (Priest Rapids 5.0M, Ringold 3.5M, and 1.7M John Day Mitigation reared and released at PR). Goal: Manage to conserve genetic resources through an integrated program of natural stock management with hatchery enhancement. Maintain a strong wild component. Maximize harvest on surplus production through a variety of mixed stock and terminal area fishery opportunities. Proposed actions: Short term: Maintain current program and address the stranding issue caused by Priest Rapids Dam power peaking that may be heavily impacting the natural population. Long term: Develop harvest opportunities to take advantage of surplus production in local area or scale the hatchery production program to be consistent with the overall harvest opportunities and natural production constraints as they exist. Investigate live capture techniques (e.g., fish wheels, traps, etc.) and/or terminal fishery opportunities (e.g., mouth of Yakima River) as opportunities to take advantage of surplus URBs and hatchery steelhead production in the local area.

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Steelhead

Status: Historically, it is believed that few steelhead spawners used this mainstem area. Small tributaries may have been used by steelhead but are generally degraded now. The current program for this area is 180K Wells stock summer steelhead (recent transition from non-local Skamania stock) released from Ringold Hatchery for fishery augmentation purposes. Goal: Establish and maintain local broodstock(s) for potential future enhancement use (egg bank program) and provide selective fishery opportunities. Proposed actions: Short term: Continue transitioning broodstock to upper Columbia Wells stock and mark all or the portion of hatchery fish targeted for selective harvest. Ringold Hatchery production should be able to accommodate a dual natural stock restoration and harvest management purpose with proper marking strategies.

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Federal Preferred Strategies for Mid-Columbia River Region-Oregon

Walla Walla River Sub-basin

Spring chinook and summer steelhead were historically abundant in the Walla Walla River. Construction of irrigation dams and associated water withdrawals resulted in the extinction of spring chinook in the watershed in the 1920s and serious decline of the summer steelhead population. Significant passage, flow and habitat problems still exist throughout the watershed. Local, State and Tribal plans exist to address most of these issues. Specifically plans have been developed on passage and screening of irrigation withdrawals, trap and haul operations for fish transportation, and water conservation.

Spring Chinook Salmon-
Status: endemic population extinct. No hatchery program underway but a Draft Hatchery Master Plan has been developed by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). This plan has been distributed for review by Oregon and Washington Department of Fish and Wildlife. Implementation, if plan approved, is scheduled for year 2000. With the native stock extinct, Carson stock has been identified in the plan as preferable choice because of logical tie-in to the Umatilla River restoration program. South Fork of Walla Walla River is highest priority for restoration, Touchet River needs further investigation of potential. There is already an adult holding facility on the South Fork Walla Walla as part of the Umatilla River program. Need to develop incubation and rearing facilities. Goal of CTUIR plan is to have a combination of natural production and surplus returns for harvest opportunities.
Draft Master Plan Production Numbers: 600,000 hatchery smolts (350K South Fork and 250K Touchet) to produce 3,000 adult returns. Natural Production goal of 2,000 adults.
Goal: reintroduce species to historically available habitat using appropriate stock. Provide tribal and sport fisheries within the watershed.
Federal Position: support continued development of hatchery master plan and review process. Depending upon final review, federal position currently supports reintroduction effort of spring chinook salmon into historical habitat of Walla Walla River watershed. Current draft master plan calls for development of incubation and rearing facilities for the South Fork Walla Walla to accommodate 350,000 yearling smolt production utilizing Carson stock or Umatilla River returns of Carson stock reintroduction. Need to have detailed tie-in and operation plans to Umatilla River reintroduction and Carson/Little White National Fish Hatchery or even Ringold hatchery, with a decision table developed to determine harvest, escapement and broodstock needs at progressive recruitment levels. Need to progress towards utilizing Walla Walla River returning Carson stock for broodstock. Touchet River needs further investigation of production potential before proceeding. Monitoring and evaluation of the reintroduction effort in the South Fork needs to be part of production program.

Summer Steelhead-
Status: population depressed and currently proposed for ESA listing as part of mid-Columbia

River ESU (Hood River on upstream to Walla Walla River). Historical estimate between 4,000 and 5,000 adults. The last five years has seen between 300 and 500 adults. Hatchery program is currently a harvest supplementation program for the lower Walla Walla River utilizing Wells/Lyons Ferry stock to return 1,500 hatchery adults. The only steelhead hatchery facilities in the basin are acclimation ponds in the lower river. The population is considered to be 90% wild in the upper watershed natural production areas. The primary natural production area is in the upper watershed. The current hatchery / harvest augmentation program calls for a release of 300,000 juveniles (125K Touchet and 175K lower Walla Walla River and Mill Creek). CTUIR draft hatchery master plan goal is 11,000 adult returns (3,000 natural production and 8,000 hatchery production with 7,650 available for harvest). As a step towards meeting the master plan goals, CTUIR proposes to initiate a hatchery supplementation program with 100,000 juvenile steelhead released into the upper watershed utilizing native broodstock. The Umatilla Hatchery would be used for incubation and rearing with additional acclimation facilities needing to be built in the South Fork and North Fork Walla Walla and Couse Creek.
Goal: conserve existing endemic population, phase out non-native hatchery stock while phasing-in endemic conventional program, and provide for tribal and sport fisheries.
Federal Position: 1) phase out release of LF/Wells stock, 2) phase in use of endemic stock for hatchery production, 3) reconsider/reduce 300K yearling LSRCP release numbers to achieve harvest augmentation adult return goal, 4) support continued development of Walla Walla River hatchery master plan, 5) manage returns to accomplish multiple goals of natural stock rebuilding and selective fishing.

Umatilla River Sub-basin

Spring chinook, fall chinook, coho, and steelhead were historically abundant in the Umatilla River. Construction of Threemile Dam and Hermiston Power and Light dams in the early 1900's along with heavy water withdrawals for irrigation for irrigation resulted in the extirpation of spring and fall chinook and coho salmon and contributed towards the substantial decline of summer steelhead populations in the watershed. Habitat, passage and adequate instream flows are continuing to be improved through a number of Federal, State, Tribal and local programs.

Spring Chinook-
Status: endemic population extinct. Reintroduction hatchery program initiated in 1986 utilizing Carson stock spring chinook. Run size goals as outlined in the Umatilla Hatchery Master Plan is 11,000 adults (1,000 adult natural production and 10,000 adult hatchery production). Returns to the Umatilla River from the reintroduction program have ranged from 13 adults in 1988 to 2,273 adults in 1996. Because of facility constraints the original production goals have been reduced from 2.3 million smolts to the current program of 860,000 yearlings (350K from Little White NFH, 100K Carson NFH, and 360K Umatilla Hatchery). All juveniles are acclimated at facilities in the upper watershed prior to release. To meet original master plan production goal, a new facility is proposed by ODFW and CTUIR for the South Fork Walla Walla River. This new facility would produce 589,000 yearling spring chinook. Overall goal is to utilize Umatilla

returns to sustain hatchery program. Monitoring and evaluation is an important component to this reintroduction effort.
Goal: reintroduce species to historically available habitat using appropriate stock. Provide tribal and sport fisheries within the watershed.
Federal Position: It's important to note that all parties at the table (states, tribes, Feds) agreed to the same strategy: Support construction of South Fork Walla Walla River facility for release of 589,000 yearling spring chinook Carson stock into Umatilla River plus shift 260,000 production from Umatilla Hatchery and 100,000 from Carson NFH to new South Fork Walla Walla River facility. Maintain 350,000 production from Little White NFH and 100,000 from Umatilla Hatchery. Total production would be 1.399 million yearling spring chinook for release into the Umatilla River.

Fall Chinook-
Status: endemic population extinct. Reintroduction hatchery program started in 1982. Upriver bright stock from Bonneville, Little White NFH, and Priest Rapids hatcheries have been used for broodstock, incubation and rearing. Tule fall chinook were released in 1982 only. Umatilla Hatchery Master plan goals identify 5.9 million juvenile production to achieve 10,000 hatchery returning adults and 11,000 naturally produced adults. Returns to the Umatilla River have ranged from 85 adults in 1985 to 1,332 adults in 1996. The current hatchery program has been reduced to 3.1 million juvenile production (480K yearling from Bonneville Hatchery and 2.7 million subyearlings from Umatilla Hatchery) . The subyearling releases have been reduced because of straying concerns into the Snake River and water shortages at Umatilla Hatchery. To help increase returns, all releases are acclimated and released in the upper watershed. Also 1,000 surplus adults from Priest Rapids are being released in the upper watershed to boost natural production.
Goal: reintroduce species to historically available habitat using appropriate stock. Provide tribal and sport fisheries within the watershed.
Federal Position: For now maintain current program of 480K yearling from Bonneville hatchery and 2.7 million subyearling from Umatilla Hatchery. Also, there is potential for increasing adult outplants into Umatilla River from Priest Rapids Hatchery in place of some of the subyearling hatchery program. The return goals need to reconsidered. Possibly discontinue or reduce subyearling releases from Umatilla Hatchery and apply fiscal savings to further develop spring chinook and steelhead programs for the Umatilla and Walla Walla River sub-basins.

Coho Salmon-
Status: endemic population extinct. Reintroduction hatchery program since 1987. Earlier attempts in the 1960's using primarily egg and fry outplants unsuccessful. Since 1987, Tanner Creek, early run stock coho have been used almost exclusively in the reintroduction program. In 1993 and 1995 returns to the Umatilla River were also used for broodstock. The Umatilla hatchery master plan did not set a run size goal for coho. NPPC Sub-basin planning efforts set a goal of 6,000 adult returns. Release goal was 1 million juveniles 1987-94 and 1.5 million 1995 to present. Returns to the Umatilla River were 29 jacks in 1987, a high of 4,683 adults in 1989,

and 807 adults in 1997. Current program is for 1 million juvenile production from Cascade Hatchery and 500,000 from Lower Herman Creek Pond. All groups direct stream release at rivermile 56. Acclimation facility to be built soon.
Goal: reintroduce species to historically available habitat using appropriate stock. Provide tribal and sport fisheries within the watershed.
Federal Position: Support current program of 1.5 million yearling release. Also would like to see Umatilla returns utilized for broodstock. Also continue negotiation with Tribes for management of Mitchell Act coho program.

Summer Steelhead-
Status: natural production is cyclical, depressed and currently proposed for ESA listing as part of mid-Columbia River ESU (Hood River on upstream to Walla Walla River). The total number of naturally produced adult returns to the Umatilla River have ranged from 725 in 1991 to 3,444 in 1987. ODFW estimates natural production equilibrium around 2,100 adults. The last five years has seen around 1,000 naturally produced adults. Hatchery smolt releases of around 300,000 from several different stocks took place from 1967-70 and 1975, but returns from those releases are unknown. Using Umatilla wild steelhead as hatchery broodstock and supplementation began in 1981. Juvenile releases have ranged from 27,000 to 210,000. Because of mass marking, an account of hatchery produced adults has been kept since 1988. Hatchery produced adults has increased from 166 in 1988 to 1,463 in 1997. Hatchery returning adults are targeted for a fishery and are used to supplement natural spawning. Naturally produced adults contribute to natural spawning escapement and are also used for hatchery broodstock. The Umatilla Hatchery Master Plan goal has been reduced from 210,000 to 150,000 because of Umatilla Hatchery constraints. The run size goal in the plan was set at 5,670 hatchery and 4,000 naturally produced adults. While the broodstock needs have been met utilizing Umatilla stock since 1980, the adult return goals have not, and may be set a bit high.
Goal: supplementation program to boost natural production and provide for harvest opportunity.
Federal Position:1) continue utilizing endemic stock for supplementation, 2) continue implementation of Umatilla hatchery master plan (150K yearling), 3) make adaptive management changes, implementing results of monitoring and evaluation (consider reducing adult production goal), 4) manage returns to accomplish multiple goals of natural stock rebuilding and selective fishing.

John Day River Sub-basin

Spring Chinook Salmon-
Status: population depressed but no immediate risk of extinction. *Goal*: conserve healthiest run of wild spring chinook salmon remaining in Columbia River basin.
Federal Position: 1) manage for wild fish to allow natural processes to occur with no hatchery intervention, 2) continue habitat enhancement projects, 3) develop wild fish refuges.

Summer Steelhead-

January 7, 1999 - Draft Federal Proposal: "Fed-1"

Status: population depressed with no immediate risk of extinction. *Goal*: conserve wild production and provide fishery.
Federal Position: 1) manage for wild fish to allow natural processes to occur with no hatchery intervention, 2) continue habitat enhancement projects, 3) develop wild fish refuges.

Deschutes River Sub-basin

Spring Chinook-
Status: population depressed, long-term decline with no immediate risk of extinction.
Goal: conserve wild fish population in Warm Springs River. Maintain genetic characteristics of endemic stock in both the stream and hatchery environment. Produce fish for tribal and sport harvest with hatchery program.
Federal Position: 1) maintain current yearling production program at Round Butte state fish hatchery (320K) and Warm Springs National Fish Hatchery (750K) using endemic stock, 2) continue implementation of Deschutes River Management Plan, 3) investigate reintroduction of fish upstream of dams @ rivermile 100.

Summer Steelhead-
Status: population depressed, long-term declining trend. *Goal*: conserve existing endemic population. Utilize historically available habitat. Minimize impact from out of basin (Snake River) strays. Provide for tribal and sport fisheries with hatchery program using endemic stock.
Federal Position: 1) maintain current production program at Round Butte state fish hatchery (162K yearling) using endemic stock, 2) continue implementation of Deschutes River Management Plan, 3) investigate reintroduction of fish upstream of dams @ rivermile 100 4) implement actions to reduce straying (modify Snake River program).

Fall Chinook-
Status: population healthy with recent trend upward. *Goal*: conserve wild production and provide fishery. *Federal Position*: 1)manage for wild fish to allow natural processes to occur with no hatchery intervention, 2) continue habitat enhancement projects, 3) continue implementation of Deschutes River Management Plan to manage population and fishery.

Sockeye-
Status: population functionally extinct as a result of dams at RM100. *Goal*: reintroduce using appropriate broodstock into historically available habitat.
Federal Position: 1) develop reintroduction plan , 2) implement actions as appropriate from planning.

Fifteenmile Creek Sub-basin

Winter Steelhead-

January 7, 1999 - Draft Federal Proposal: "Fed-1"

Status: population depressed and declining. *Goal:* conserve wild production.
Federal Position: 1)manage for wild fish to allow natural processes to occur with no hatchery intervention, 2) continue habitat enhancement projects.

Hood River Sub-basin

Spring Chinook-
Status: endemic population is extinct. Reintroduction program began in 1986.
Goal: reintroduce species to historically available habitat using appropriate stock. Provide tribal and sport fisheries within the watershed. *Federal Position*: 1)follow and implement Hood River hatchery master plan (125K near-term to 250K long-term yearling production goal), 2) utilize Deschutes River stock and Deschutes River and Hood River facilities to implement program. 3) utilize Hood River returning adults for broodstock.

Summer steelhead-
Status: population very depressed. *Goal*: conserve existing endemic population, supplement with endemic hatchery program, and provide for tribal and sport fisheries.
Federal Position: 1) implement Hood River hatchery master plan utilizing endemic stock (phase in 150K yearling program), 2) phase out release of 60K yearling Skamania stock, 3) manage returns to accomplish multiple goals of natural stock rebuilding and selective fishing.

Winter Steelhead-
Status: population depressed. *Goal*: conserve existing endemic population, supplement with endemic hatchery program, and provide for tribal and sport fisheries.
Federal Position: 1) implement Hood River hatchery master plan utilizing endemic stock (50K near-term to 85K long-term yearling production goal), 2) manage returns to accomplish multiple goals of natural stock rebuilding and selective fishing.

VII. Lower Columbia River Regional Summary, Below Bonneville Dam

Table 5. Lower Columbia Proposed Federal Production Programs

Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
Columbia River mainstem	Fall Chinook (URB) not native below Bon. Dam			X	Manage to provide fishery benefits. Minimize negative impacts to natural spawning tule fall chinook in nearby streams.	In near term, continue 4.6 M URB program for John Day mitigation. Assess effects of hatchery strays on nearby natural populations of tule fall chinook salmon.
	Fall Chinook (Tule) unknown status		d?			
	Coho Salmon			X	Manage to maximize fishery benefits.	1.175M release into Tanner Creek. Manage for selective fishery.
Columbia River mainstem, small tributaries	Fall chinook status, proposed for listing		?	?	Maintain or re-establish natural populations	Assess need for short term (1 generation) re-introduction programs for tule fall chinook in such areas as Germany Creek, Coweeman River, etc.

Final listing decisions for lower Columbia River chinook and coho salmon are expected in the spring of 1999. At this time, decisions concerning which of the hatchery populations are part of the biological ESU should also be made. Specific proposed actions in many cases could not be made until the status of hatchery populations are determined.

Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

January 7, 1999 - Draft Federal Proposal: "Fed-1"

Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	Coho Salmon	?	?		Establish and manage for natural populations in the small tributaries. Promote development of stock structure for natural populations.	Assess need for short term (1-2 generation) programs for re-establishing natural populations in the small tributaries. Identify appropriate broodstock source.
	Chum Salmon	?	?		Establish and manage for natural populations in the small tributaries.	Assess need for short term (1-2 generation) programs for re-establishing natural populations in the small tributaries. Identify appropriate broodstock source.
	Winter Steelhead	d		?	Establish and manage for natural populations in the small tributaries.	Assess need for short term (1-2 generation) programs for re-establishing natural populations in the small tributaries. Identify appropriate broodstock source.
	Sea-run Cutthroat	?	?		Establish and manage for natural populations in the small tributaries.	Assess need for short term (1-2 generation) programs for re-establishing natural populations in the small tributaries. Identify appropriate broodstock source.

Final listing decisions for lower Columbia River chinook and coho salmon are expected in the spring of 1999. At this time, decisions concerning which of the hatchery populations are part of the biological ESU should also be made. Specific proposed actions in many cases could not be made until the status of hatchery populations are determined.

Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

January 7, 1999 - Draft Federal Proposal: "Fed-1"

Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
Sandy River	Fall Chinook	d			Manage and promote healthy natural population.	No hatchery program proposed. Manage for natural production only.
	Spring Chinook	d		X	Manage and promote development of natural population. Provide fishery opportunity.	Manage upper Sandy River sub-basin for natural production. Minimize hatchery strays escaping to upper basin. Limit release of hatchery fish to lower basin below Marmot Dam (0.6M). Manage returning adults for selective fishery consistent with coast wide marking policies.
	Coho Salmon	d?	?	X	Manage and promote development of natural population. Provide fishery opportunity. Promote coho stock structure with in Columbia River Region.	Manage upper Sandy River sub-basin for natural production. Minimize hatchery strays escaping to upper basin. Release 0.7 to 1.0 M Sandy River stock coho into lower Sandy River. Manage and target returning adults for selective fishery consistent with coast wide

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Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

January 7, 1999 - Draft Federal Proposal: "Fed-1"

Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						marking policies. Allow some returning adults to colonize available habit within the lower river basin Do not import other hatchery stocks into basin.
	Summer Steelhead			X	Provide fishery opportunity targeting hatchery fish.	Limit release of hatchery fish to lower basin below Marmot Dam. Minimize hatchery straying to upper basin. Mark and target hatchery fish for selective fishery in lower basin. Assess possibility of developing local broodstock source.
	Winter Steelhead	d		X	Manage and promote development of natural population Provide fishery opportunity.	Limit release of hatchery fish to lower basin below Marmot Dam. Minimize hatchery straying to upper basin. Mark and target hatchery fish for selective fishery in lower basin. Transition from current non-native broodstock to locally derived Sandy River stock.
	Sea-run	d?	?		Manage and promote development of	Manage for natural production.

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Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

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Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	Cutthroat				natural population.	Assess need for short term (1-2 generation) re-introduction program.
	Chum		?			Assess historical use of drainage by chum and determine if short term re-introduction program is warranted.
Clackamas River	Spring Chinook	d		X	Manage and promote development of natural population. Provide fishery opportunity.	Manage upper Clackamas River sub-basin for natural production. Minimize hatchery strays escaping to upper basin. Limit release of hatchery fish to lower basin below North Fork Dam (1.2M). Manage returning adults for selective fishery consistent with coast wide marking policies. Investigate use of the Clackamas broodstock for reintroduction within the Willamette Basin
	Fall Chinook	d			Manage and promote development of	No hatchery program.

Final listing decisions for lower Columbia River chinook and coho salmon are expected in the spring of 1999. At this time, decisions concerning which of the hatchery populations are part of the biological ESU should also be made. Specific proposed actions in many cases could not be made until the status of hatchery populations are determined.

Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
					natural population.	
	Coho early hatchery stock			X	Provide terminal fishing opportunity.	Release up to 1.0 M coho into lower basin below North Fork Dam. Manage and target for selective fishery consistent with coast wide marking policies.
	Coho Salmon late native stock	a,d c?			Preserve weak native late run above North Fork Dam. Restore healthy natural population to upper basin.	Continue intervention to prevent extinction of weak year classes of late run coho returning to upper basin. Release fish to upper basin. Do not target for fishery.
	Summer Steelhead			X	Provide terminal fishery opportunity	Limit release of hatchery fish to lower basin below North Fork Dam. Minimize hatchery straying to upper basin. Mark and manage returning adults for selective fishery.
	Winter Steelhead	d		X	Manage and promote development of natural population. Provide terminal fishery opportunity.	Manage upper basin above North Fork Dam for natural production. Limit release of hatchery fish to lower basin below North Fork

Final listing decisions for lower Columbia River chinook and coho salmon are expected in the spring of 1999. At this time, decisions concerning which of the hatchery populations are part of the biological ESU should also be made. Specific proposed actions in many cases could not be made until the status of hatchery populations are determined.

Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

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Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						Dam. Minimize hatchery straying to upper basin. Mark and manage returning adults for selective fishery. Transition to local Clackamas River stock.
	Sea-run Cutthroat	d?	?			Manage for natural production. Assess need for short term (1-2 generation) re-introduction program.
	Chum		?			Assess historical use of drainage by chum and determine if short term re-introduction program is warranted.
Upper Willamette River	Spring Chinook	c		X	Promote and manage for healthy natural populations. Promote stock structure with the basin. Provide fishery opportunities.	Limit transfer of hatchery stocks between hatchery facilities to promote stock structure. Minimize hatchery straying to remaining natural production areas. Manage and target for selective fishery consistent with

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Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

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Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						coast wide marking policies.
	Fall Chinook not native	?				No hatchery program
	Coho Salmon not native	?				Manage hatchery fish for selective fishery consistent with coast wide marking policies. If possible develop a broodstock adapted to local conditions.
	Summer Steelhead not native			X	Provide fishery opportunities.	Minimize straying of hatchery fish to steelhead natural production areas. Mark and target hatchery fish for selective fishery.
	Winter Steelhead proposed threatened	d		X	Manage and promote development of natural population. Promote stock structure. Provide terminal fishery opportunity.	Minimize straying of hatchery fish to steelhead natural production areas. Limit stock transfers between hatcheries. Mark and target hatchery fish for selective fishery. Transition to locally derived stock if non-local fish currently used.

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Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

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Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
Big Creek	Fall Chinook	d		X	Manage to provide fishery benefits. Minimize negative impacts to natural spawning tule fall chinook in nearby streams.	5.7M Tule stock for on station release.
	Coho Salmon	d?	?	X	Manage to provide fishery benefits. Minimize negative impacts to natural spawning coho in nearby streams.	595K Big Creek stock for on station release. Mark and target hatchery releases to allow selective fishery consistent with coast-wide mark policies..
	Winter Steelhead	d		X	Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to natural spawning winter steelhead in nearby streams.	Mark hatchery releases to allow selective fishery.
	Sea-run Cutthroat	d?	?		Manage and promote development of natural population.	No hatchery program.
	Chum		?			Assess historical use of drainage by chum and determine if short term re-introduction program is warranted.

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Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

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Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
S.A.F.E. (Youngs Bay and Tribs and Mainstem Net Pens)	Spring Chinook			X	Manage to provide fishery benefits. Minimize negative impacts to natural spawning tule fall chinook in nearby streams.	Manage and target for terminal and/or selective fishery consistent with coast wide marking policies.
	Fall Chinook			X	Manage to provide fishery benefits. Minimize negative impacts to natural spawning tule fall chinook in nearby streams.	
	Coho Salmon			X	Manage to provide fishery benefits. Minimize negative impacts to natural spawning tule fall chinook in nearby streams.	Manage hatchery fish to allow selective fishery consistent with coast wide marking policies.
Grays River	Fall Chinook	d?		X	Manage to provide fishery benefits. Minimize negative impacts to natural spawning coho in nearby streams.	Manage hatchery fish to allow selective and/or terminal fishery consistent with coast wide marking policies.
	Coho Salmon	d?		X	Manage to provide fishery benefits	Manage hatchery fish to allow

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Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
					targeting on hatchery fish. Minimize negative impacts to natural spawning coho in nearby streams.	selective and/or terminal fishery consistent with coast wide marking policies.
	Chum Salmon	c?			Maintain and rebuild natural population.	Manage for natural production. Assess using Grays River stock as donor source if short term re-introduction programs in nearby streams. Protect and enhance habitat.
	Winter Steelhead	d		X?	Manage for natural production. Provide fishery opportunities.	Manage and target hatchery fish for selective. Limit hatchery fish to lower portion of Grays River sub-basin. Transition to local broodstock.
	Sea-run Cutthroat	?	?			Proposed actions pending listing decisions.
Elochomin River	Fall Chinook	d		X	Manage to provide fishery benefits. Minimize negative impacts to natural spawning tule fall chinook in nearby	4.0M Elochoman stock into Elochoman River. Promote development of lower Columbia

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Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

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Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
					streams.	River stock structure by limiting transfers of eggs into basin from other facilities.
	Coho Salmon	d		X	Manage to provide fishery benefits. Minimize negative impacts to natural spawning coho in nearby streams.	Type N- 0.8M, Type-S-0.5M in river release. Manage and target hatchery fish for selective fishery consistent with coast-wide mark policies.
	Summer Steelhead	?		X	Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to natural spawning winter steelhead in nearby streams.	In the short term, continue the 30K Skamania stock for in river release. Limit hatchery releases to lower part of river. Mass mark hatchery releases and target for selective fishery. Manage upper basin for natural production. Assess feasibility of transitioning to more local broodstock.
	Winter Steelhead	d		X	Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to natural spawning winter steelhead in nearby	135K Elochoman stock for release in the lower river. Mass mark hatchery releases and target for selective fishery. Manage upper

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Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
					streams. Develop healthy natural population.	basin for natural production and minimize hatchery fish to this area. Assess options and transition to locally derived broodstock source.
	Chum?	?	?			Assess historical use of drainage by chum and determine if short term re-introduction program is warranted or needed.
	Sea-run Cutthroat	?	?	X?	Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to naturally spawning sea-run cutthroat in the Elochoman and nearby streams.	30K Elochoman stock for on station release. Mass mark hatchery releases to allow selective fishery.
Cowlitz River	Spring Chinook	b?	X	X	Provide fishery opportunity targeting hatchery fish. Develop natural population if access to historical habitat in upper basin is feasible.	1.12M Cowlitz stock for on station release. Manage and target hatchery fish for selective fishery consistent with coast-wide mark policies. Continue re-introduction efforts into upper

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Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						basin.
	Fall Chinook	d?		X	Manage to provide fishery benefits. Minimize negative impacts to natural spawning tule fall chinook in nearby streams.	6.5M Cowlitz stock for in river release. Manage and target hatchery fish for selective and/or terminal fishery consistent with coast-wide mark policies.
	Coho Salmon	d		X	Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to naturally spawning coho in the Cowlitz and nearby streams.	4.0M Cowlitz Type-N stock for in river release. Manage and target hatchery fish for selective fishery consistent with coast-wide mark policies.
	Chum?	?	?			Assess historical use of drainage by chum and determine if short term re-introduction program is warranted or needed.
	Summer Steelhead	d?		X	Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to naturally spawning summer steelhead in the Cowlitz and nearby streams.	400K Cowlitz stock for in river release. Mass mark hatchery releases to allow selective fishery.

Final listing decisions for lower Columbia River chinook and coho salmon are expected in the spring of 1999. At this time, decisions concerning which of the hatchery populations are part of the biological ESU should also be made. Specific proposed actions in many cases could not be made until the status of hatchery populations are determined.

Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

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Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	Winter Steelhead	d		X	Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to naturally spawning winter steelhead in the Cowlitz and nearby streams.	1.06M Cowlitz stock for in river release. Mass mark hatchery releases to allow selective fishery.
	Sea-run Cutthroat	?	?	X?	Fulfill mitigation requirements. Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to naturally spawning searun cutthroat in the Cowlitz and nearby streams. Fulfill mitigation requirements.	160K Cowlitz stock for on station release Mass mark hatchery releases to allow selective fishery.
Kalama River	Spring Chinook	d		X	Rebuild healthy natural population. Provide fishing opportunity.	Manage and target hatchery fish for selective fishery consistent with coast-wide mark policies. Limit transfers of eggs/fish into basin to promote stock structure and local adaption. Limit hatchery fish to lower basin and manage upper basin for natural production.

Final listing decisions for lower Columbia River chinook and coho salmon are expected in the spring of 1999. At this time, decisions concerning which of the hatchery populations are part of the biological ESU should also be made. Specific proposed actions in many cases could not be made until the status of hatchery populations are determined.

Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

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Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
	Fall Chinook	?		X	Rebuild healthy natural population. Provide fishing opportunity.	Pending listing decisions.
	Coho Salmon	?			Rebuild healthy natural population. Provide fishing opportunity.	Manage and target hatchery fish for selective fishery consistent with coast-wide mark policies. Limit transfers of eggs/fish into basin to promote stock structure and local adaption. Limit hatchery fish to lower basin and manage upper basin for natural production.
	Summer Steelhead	d		X	Rebuild healthy natural population. Provide fishing opportunity.	Manage and target hatchery fish for selective fishery consistent with coast-wide mark policies. Limit hatchery fish to lower basin and manage upper basin for natural production. Transition to local broodstock.
	Winter Steelhead	d		X	Rebuild healthy natural population. Provide fishing opportunity.	Manage and target hatchery fish for selective fishery consistent with coast-wide mark policies. Limit hatchery fish to lower basin and manage upper basin for

Final listing decisions for lower Columbia River chinook and coho salmon are expected in the spring of 1999. At this time, decisions concerning which of the hatchery populations are part of the biological ESU should also be made. Specific proposed actions in many cases could not be made until the status of hatchery populations are determined.

Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

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Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						natural production. Transition to local broodstock.
	Sea-run Cutthroat	d			Rebuild healthy natural population.	Pending listing decisions.
	Chum	?	?			Pending listing decisions.
Lewis River	Spring Chinook	b?		X	Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to naturally spawning coho in the Lewis and nearby streams.	Manage and target hatchery fish to allow selective fishery consistent with coast-wide mark policies.
	Fall Chinook	d		X?	Maintain healthy natural populations	Pending listing decisions.
	Coho Salmon	c?d?	?	X	Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to naturally spawning coho in the Lewis and nearby streams. Promote lower Columbia River stock structure. .	Manage and target hatchery fish to allow selective fishery consistent with coast-wide mark policies. Limit transfers of eggs/fish into basin from other sources to promote local adaption.
	Chum?	?	?			Assess historical use of drainage

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Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						by chum and determine if short term re-introduction program is warranted.
	Summer Steelhead	d		X	Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to natural spawning summer steelhead in nearby streams.	Mass mark hatchery releases to allow selective fishery. Transition to locally derived broodstock.
	Winter Steelhead	d		X	Provide fishery opportunity targeting hatchery fish. Minimize negative impacts to natural spawning winter steelhead in nearby streams.	Mass mark hatchery releases to allow selective fishery. Transition to locally derived broodstock.
	Sea-run Cutthroat	?		X	Maintain or re-establish natural populations.	Assess need for short term (1-2 generation) programs for re-establishing natural populations in the small tributaries. Identify appropriate broodstock source.
Washougal	Fall Chinook	d		X		Pending listing decisions.

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Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

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Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
River						
	Coho Salmon	c?	X	X	Provide fishing opportunities targeting hatchery fish. Minimize interactions with naturally produced fish.	Manage and target hatchery fish to allow selective fishery consistent with coast-wide mark policies. Limit transfers of eggs/fish into basin from other sources to promote local adaption.
	Summer Steelhead	d?		X	Provide fishing opportunities that target hatchery fish. Minimize interactions with natural fish.	Mass mark hatchery releases to allow selective fishery. If possible develop a broodstock adapted to local conditions. Limit hatchery releases to lower basin.
	Winter Steelhead	d		X	Provide fishing opportunities that target hatchery fish. Minimize interactions with natural fish.	Mass mark hatchery releases to allow selective fishery. If possible develop a broodstock adapted to local conditions. Limit hatchery releases to lower basin.
	Sea-run Cutthroat	d?		?	Establish healthy natural population. Provide fishery opportunity?	Assess need for short term (1-2 generation) programs for re-establishing natural populations in the small tributaries. Identify

Final listing decisions for lower Columbia River chinook and coho salmon are expected in the spring of 1999. At this time, decisions concerning which of the hatchery populations are part of the biological ESU should also be made. Specific proposed actions in many cases could not be made until the status of hatchery populations are determined.

Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

Subbasin	Species/ Status	Management Objectives 1	2	3	Desired Results	Proposed Actions
						appropriate broodstock source. Mass mark hatchery releases to allow selective fishery.

Final listing decisions for lower Columbia River chinook and coho salmon are expected in the spring of 1999. At this time, decisions concerning which of the hatchery populations are part of the biological ESU should also be made. Specific proposed actions in many cases could not be made until the status of hatchery populations are determined.

Management Objectives:
1) Conservation of genetic resources: a. Preservation, b. Enhancement, unrestricted use of hatchery fish in target stream, c. Enhancement, controlled use of hatchery fish in target stream, d. No immediate action.
2) Re-introduction in historical habitat.
3) Fishery augmentation program.

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Grande Ronde Sub-basin

1. Spring/Summer Chinook Salmon

A. Current Status:

1. Natural Population:

Naturally reproducing Grande Ronde Basin spring/summer chinook salmon populations have shown a steady reduction in productivity and abundance similar to other populations within the Snake River Basin since the late 1950's. In 1992, they were formally listed as threatened under the Endangered Species Act (ESA). Escapement levels in the basin have been severely depressed with some major spawning areas falling below 20 spawners in recent years. Natural populations are at high risk of extinction based on escapement trends, abundance of spawners, and low progeny-to-parent ratios. Genetic assessments by NMFS indicate that there is still significant genetic differentiation among natural populations and between natural and hatchery populations. Estimates of natural escapement levels at full seeding range from 1,700 (current conditions) to 12,400. ODFW identified 5 management units (Wenaha, Minam, Lostine and Wallowa tributaries, Catherine, and upper Grande Ronde) containing naturally reproducing populations based on genetics, geography, life histories, and management history.

The production potential of the Grande Ronde Basin is considered to be medium in terms of its contribution to the overall potential of the Snake River spring/summer ESU. The biological importance was rated in the low/medium range of importance due to the apparent isolation from other populations within the Snake River ESU coupled with the uncertainties associated with the extensive use of nonendemic stocks in the basin.

2. Hatchery Program

There are currently three spring/summer chinook salmon programs in the basin operated under the Lower Snake River Compensation Plan (LSRCP) and the Fish and Wildlife Program (NPPC). The LSRCP program was initiated in 1984 with the use of nonendemic stocks (Carson and Rapid River) due to a lack of naturally returning fish to Lookingglass Ck. The use of nonendemic stocks allowed for the rapid development of broodstock to achieve smolt production goals. However, smolt-to-adult survival rates have been consistently poor (< .35 %) providing limited tribal fishery opportunities (no sport) and returning adults strayed at high rates into the Lostine, Minam, and Wenaha rivers representing a high proportion of the natural spawners observed in some years. The LSRCP production goal is 900,000 smolts at 20 per pound to produce 5,820 adults.

A captive broodstock program was initiated in Catherine, Lostine, and upper Grande Ronde

rivers in 1995. The goal of the program was to reduce demographic risk of extinction while maintaining the genetic diversity of the endemic populations. The program is designed to last a minimum of 5 years. Up to 500 parr a year are collected in each river and split between freshwater and saltwater rearing facilities. Resulting adults are spawned and up to 100,000 juveniles are to be returned to their river of origin.

A conventional endemic program was initiated in Catherine, Lostine, and upper Grande Ronde rivers in 1998. The program was designed using a sliding scale framework to annually collect returning adults in each river to produce up to 150,000 smolts to the three populations. The sliding scale places fewer genetic risk constraints on the hatchery program at low population levels in an attempt to boost population levels quickly by using the expected survival advantage provided by the hatchery for the egg-to-smolt life history stage.

The existing Rapid River stock is currently being terminated except for maintenance of up to 150,000 smolt release in Lookingglass Ck. from unmarked adult returns to Lookingglass FH. The use of Rapid River stock will be phased out as endemic broodstock and production increase.

Captive broodstock and conventional supplementation using the sliding scale framework may help populations persist longer in the basin because of the expected egg-to-smolt survival advantage provided by the hatchery. Unless mainstem passage survival and natural productivity increases to allow progeny-to-parent ratios to consistently exceed 1.0, natural population will likely go extinct. Given the uncertainties associated with the use of artificial propagation to conserve or enhance natural production, a diversified approach should be implemented.

B. Goals and Objectives

The primary goal for the Grande Ronde Basin is to attempt to prevent extinction and maintain the remaining genetic diversity of the remaining populations until natural productivity increases to replacement levels. The short term objectives of the current hatchery program(s) should be directed toward conservation strategies. Longer term objectives directed toward recovery of natural populations and selective fishery opportunities will be extremely limited until natural populations have increased substantially and are above replacement.

C. Metapopulation Structure

Five natural populations of spring/summer chinook salmon have been identified in the Grande Ronde Basin (Catherine, Lostine, upper Grande Ronde, Minam and Wenaha). The Minam and Wenaha have been managed as wild fish areas. Most production today occurs in the five tributaries mentioned above plus Lookingglass Ck (hatchery). Adults for the current hatchery program(s) are collected at river mile 3.7 on Lookingglass Ck. and at yet completed adult trapping facilities on the Lostine, Catherine, and upper Grande Ronde rivers.

D. Risk Analysis Considerations

$Natural populations are extremely depressed and declining. Risk of extinction is high based on escapement trends, abundance of spawners, and low progeny-to-parent ratios.

$Supplementation with nonendemic stocks has resulted in low natural escapement levels to rivers supplemented.

$There appears to be significant genetic differentiation between hatchery and natural populations and between natural populations in the Minam R., Wenaha R., Grande Ronde R., Lostine R., and Catherine Ck.

$Removal of all marked Rapid River stock from the Grande Ronde Basin may reduce genetic and ecological effects to endemic populations in the basin..

$Unmarked returns to Lookingglass Ck. will be phased out as endemic broodstock sources become available.

$Given the uncertainties associated with artificial propagation to conserve and enhance natural production, a diversified approach will be used (captive broodstock, conventional supplementation, and hands off control areas).

$Many hatchery programs have demonstrated the ability to return larger numbers of adult fish per spawner compared to populations spawning naturally, due to the much higher egg-to-smolt survival advantage of the hatchery.

$There is an extensive monitoring program in the basin.

$Hatchery programs may reduce fitness of populations in the natural environment.

$Hatchery programs may remain genetic museums unless productivity of naturally reproducing populations exceeds replacement.

$Existing facility space may limit numbers of populations (programs) that can be cultured.

E. Federal Preferred Alternative

Complete the phase out of the marked Rapid River program in the Grande Ronde Basin. Continue captive broodstock program and initiate conventional supplementation program in Catherine Ck., Lostine R., and upper Grande Ronde R. (captive + conventional @ 250,000 juveniles each = 750,000). Continue unmarked Rapid River adult return program at Lookingglass at 150,000 as a backup until it can be phased out with an endemic program.

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Criteria for the captive (collection of up to 500 parr and release of up to 100,000 smolts per river) and conventional supplementation (sliding scale for release of up to 150,000 smolts per river) programs are defined in the Section 10 Permits.

Identify additional facility needs and budgets to meet program goals and objectives.

Continue to manage for 6 populations in the Grande Ronde Basin (Lostine, Catherine, and upper Grande Ronde - endemic hatchery programs, Minam and Wenaha - wild fish, and Lookingglass - nonendemic hatchery).

Identify contingency management plans (e.g. combining populations) if natural population(s) are projected to decline below an effective population size (N^e) of 50 fish in the next 6 years.

Continue monitoring and evaluation of hatchery and natural fish.

Identify contingency plans for dealing with hatchery adults in excess to program needs.

Grande Ronde Sub-basin

I. Steelhead

A. Current Status:

1. Natural Population:

Naturally reproducing Grande Ronde Basin steelhead populations have shown a steady reduction in productivity and abundance similar to other populations within the Snake River Basin since the late 1950's. In 1996, they were formally listed under the Endangered Species Act (ESA). Escapement levels in the basin have been moderately depressed with some minor increases in redd counts in recent years. Natural populations are at moderate risk of extinction based on escapement trends, abundance of spawners, and low progeny-to-parent ratios. There is limited genetic data to indicate if there is significant genetic differentiation among natural populations and between natural and hatchery populations. Estimates of natural escapement levels at full seeding range from 15,900 to 18,450. ODFW identified 6 management units (Wenaha, Minam, lower Grande Ronde R., Joseph Ck., Wallowa R., and upper Grande Ronde R. containing naturally reproducing populations based on genetics, geography, life histories, and management history.

The production potential of the Grande Ronde Basin is considered to be high in terms of its contribution to the overall potential of the Snake River steelhead ESU. The biological importance was rated in the medium range of importance due to the apparent isolation from other populations within the Snake River ESU coupled with the uncertainties associated with the extensive use of nonendemic stocks in the basin.

2. Hatchery Program

There are currently two steelhead program in the Grande Ronde Basin operated by ODFW and WDFW under the Lower Snake River Compensation Plan (LSRCP). The LSRCP program was initiated in 1976 with the collection of adults trapped at Ice Harbor Dam, Little Goose Dam (1977-78), and embryos from Pahsimeroi FH (1979). Returning adults (Wallowa stock) are now trapped at Big Canyon, Wallowa, and Cottonwood facilities, reared at Irrigon and Lyons Ferry FH=s, acclimated and released at Wallowa, Big Canyon, and Cottonwood facilities, or directly released in the basin. The use of nonendemic stocks allowed for the rapid development of broodstock to achieve smolt production goals. In large part smolt-to-adult survival rates have been sufficient enough to meet broodstock needs and provide fishery opportunities but have not met adult return goals. The LSRCP production goal for the basin is 1,650,000 smolts to produce 9,184 adults.

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The Grande Ronde Basin steelhead programs were not designed to conserve or supplement natural production in the basin. There is concern regarding out of basin straying of Wallowa stock into the Deschutes River, however, there is little data to determine the extent or impacts of straying into natural production areas within the Grande Ronde Basin. The Wallowa stock steelhead exploitation rate is approximately 70% including out of basin recoveries.

B. Goals and Objectives

The primary goal for the Grande Ronde Basin is to attempt to prevent extinction and maintain the remaining genetic diversity of the remaining populations until natural productivity increases to replacement levels. The short term objectives of the current hatchery program(s) should be directed toward conservation strategies. Longer term objectives directed toward recovery of natural populations and selective fishery opportunities will be extremely limited until natural populations have increased substantially and are above replacement.

C. Metapopulation Structure

Six natural populations of steelhead have been identified in the Grande Ronde Basin (lower Grande Ronde R., Joseph Ck., Wallowa R., upper Grande Ronde, Minam and Wenaha). Joseph Ck., Minam R. and Wenaha R. have been managed as wild fish areas. Production occurs throughout the basin with current primary areas in the six tributaries mentioned above.

D. Risk Analysis Considerations

$Natural populations are moderately depressed and slightly increasing. Risk of extinction is moderate based on escapement trends, abundance of spawners, and low progeny-to-parent ratios.

$The magnitude and impacts of straying of nonendemic Wallowa stock on natural production in the basin is unknown.

$There is limited data to assess genetic differentiation between hatchery and natural populations and between natural populations in the Minam R., Wenaha R., upper Grande Ronde R., lower Grande Ronde R., and Joseph Ck., and Wallowa R.

$It is unknown if management should be based on multiple populations or as a single basin population.

$Phase in of endemic stocks from the Grande Ronde Basin may reduce genetic and ecological effects to endemic populations in the basin..

$Given the uncertainties associated with artificial propagation to conserve and enhance natural

production, a diversified approach should be used.

$Hatchery programs have demonstrated a survival advantage over natural populations.

$There needs to be an extensive monitoring program developed in the basin.

$Hatchery programs may reduce fitness of populations in the natural environment.

$Hatchery programs may remain genetic museums unless productivity of naturally reproducing populations exceeds replacement.

$Existing facility space may limit numbers of populations (programs) that can be cultured.

E. Federal Preferred Alternative

Develop plans and initiate phase in of endemic steelhead stocks in the lower Grande Ronde R, upper Grande Ronde R, and Wallowa R. Assess, identify, and develop actions necessary to reduce Astraying A issues of Wallowa stock in the Deschutes R. and Grande Ronde Basin to acceptable levels during the phase in period (1. Reduce existing Cottonwood, Big Canyon, and Wallowa programs to an appropriate level where harvest and trapping for broodstock recover the majority of adult returns. 2. Eliminate direct stream releases in the upper Grande Ronde R. and Catherine Ck. until adult trapping/acclimation facilities are constructed. 3. Reduce production until both in/out of basin stray rates are at acceptable levels.).

Identify additional facility needs and budgets to meet program goals and objectives.

Continue to manage for 6 populations in the Grande Ronde Basin (Phase in endemic/phase out Wallowa stock - Wallowa R., upper Grande Ronde R., and lower Grande Ronde R.; wild fish - Minam R., Joseph Ck., and Wenaha R.).

Identify contingency management plans (e.g. combining populations) if natural population(s) are projected to decline below an effective population size (N^e) of 50 fish in the next 6 years.

Continue monitoring and evaluation of hatchery and natural fish.

Identify contingency plans for dealing with hatchery adults in excess to program needs.

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Grande Ronde Sub-basin Plan

1. Sockeye Salmon, Coho Salmon, Fall Chinook Salmon

1. Current Status

Extinct.

E. Federal Preferred Alternative

Continue NEOH planning and Columbia Basin planning.

HATCHERY APPENDIX F

General Cost Estimates for Evaluating Hatchery Options

The following information can be used to develop cost estimates for the three options discussed in the Hatcheries section of this paper. Depending upon factors such as the number of hatchery facilities needed, water availability, real estate costs, feasibility of obtaining sufficient brood fish and related logistical issues, actual costs are expected to vary widely. Table 1 shows "generic" estimates of construction, operation, and maintenance costs for various types of hatchery facilities. Table 2 provides an estimate of the current costs of federally funded hatchery programs.

Table 1. Generic Propagation Cost Assumptions

ACTIVITY	CAPITAL	O&M
BROODSTOCK COLLECTION & SPAWNING	$6 million	$100K
REARING (NATURES)	$4 million	$100K
ACCLIMATION FACILITIES	see Broodstock Collection	$100K
MONITORING & EVALUATION		$100K
RESEARCH		$100K
MANAGEMENT. & ADMINISTRATION		$50K
TOTAL	**$10 million**	**$550K**

1) Costs are on a per population basis.
2) Costs are for a 200,000 steelhead smolts or 400,000 chinook smolts per population.

Table 2. Annual Federal Hatchery Costs – FY'99

COST CATEGORY	APPROXIMATE COST
MITCHELL ACT O&M	$13 million
LSRCP O&M	$14 million
LSRCP AMORTIZATION	$9 million
COE O&M	$9 million
COE AMORTIZATION	$1 million
BOR O&M	$2 million
BOR AMORTIZATION	$0 million
BPA O&M	$10 million
BPA AMORTIZATION	$10 million
TOTAL	**ABOUT $70 MILLION**

ASSUMPTIONS:

1) Capital Amortization (principle & interest) is 10% annually
2) Bonds are 15 year.

Tables 3 and 4 identify ESUs potentially requiring hatchery intervention (if ESU productivity fails to increase). Table 4 most closely resembles Hatchery Option 1 (current program). Table 3 most closely resembles Hatchery Options 2 and 3 (increased conservation emphasis).

Table 3. Salmon and Steelhead Populations Affected by '99 Decision

ESU	NUMBER OF POPULATIONS
Snake River Steelhead	26
Middle Columbia River Steelhead	18
Snake River Spring/Summer Chinook	39
Middle Columbia River Chinook	10
TOTAL	**93**

Table 4. New Propagation Interventions per Fed-1 Plan for Artificial Propagation

ESU	NUMBER OF POPULATIONS
Snake River Steelhead	12
Upper Columbia River Steelhead	3
Middle Columbia River Steelhead	3
Snake River Spring/Summer Chinook	3
Upper Columbia River Chinook	6
Middle Columbia River Spring Chinook	1
TOTAL	**28**

[Pers. comm. Mike Delarm, NMFS]

HATCHERY APPENDIX G

Summary Description of Artificial Propagation Evaluative Tools Under Development by NMFS

VIABLE SALMON POPULATIONS

NMFS is developing a science paper entitled " Viable Salmon Populations and the Recovery of Ecologically Significant Units." This paper identifies the attributes of viable salmon populations and provides guidance on determining the conservation status of populations. Viability criteria and a framework for identifying the biological requirements of listed salmonids will also be provided to ensure the survival and recovery of listed species.

The paper describes 4 parameters for evaluating population status: abundance, productivity, population spatial structure (distribution), and diversity. The status of individual populations and ESU s relative to these parameters will drive protection and recovery actions including the use of artificial propagation. Activities in the various "Hs" will be guided based on whether given population(s) are at or near viable (healthy) thresholds or critical (at risk of extinction) thresholds.

The status of individual populations and overall ESUs will determine in significant part whether artificial propagation should be considered as a recovery measure. An analysis leading to a possible decision to intervene with artificial propagation on a listed population will be initiated based on these viability parameters.

CAPTIVE PROPAGATION

In February 1999, NMFS published Interim Standards for the use of Captive Propagation Technology in Recovery of Anadromous Salmonids Listed under the Endangered Species Act. These interim standards establish protocols for determining when captive propagation could be used to preserve listed fish populations and provide a framework for developing and evaluating captive propagation proposals.

Captive propagation is a protection measure of last resort. It is generally applied only when a population is at or below a critical threshold (see VSP paper). If the status of a population is declining and a risk/benefit assessment indicates that artificial propagation should be applied, it is better to intervene earlier with a supplementation program rather than waiting until populations become critically low and then applying the riskier captive propagation technology.

HATCHERY & GENETIC MANAGEMENT PLANS

NMFS is using the Hatchery and Genetic Management Plan (HGMP) as the basis for evaluating hatchery programs under the Endangered Species Act. As they are developed, the Plans will be used to evaluate likely benefits and risks of hatchery programs to naturally produced fish

populations. The HGMPs provide a comprehensive understanding of a given propagation program and its relationship to sub-basin habitat conditions, the status of natural populations in the applicable sub-basin, and associated harvest programs.

The NW Power Planning Council is also considering the use of the HGMPs as the vehicle to review propagation proposals for consistency with their propagation policies and funding requirements. The HGMPs should also be useful in the development of comprehensive sub-basin plans.

BENEFIT - RISK ASSESSMENT

Benefit/Risk assessments are required in the review of propagation programs under the ESA. These assessments are an integral part of the HGMP. NMFS and other agencies are cooperating in the drafting of guidelines for conducting benefit/risk assessments. The purpose of these guidelines is to help those proposing a propagation program to minimize the biological risks to natural populations while achieving the desired benefits of the program.

INTEGRATION OF THE ABOVE TOOLS

The VSP and Captive Broodstock standards will help guide choices when intervention to conserve a natural population or ESU might be necessary to protect a population or ESU from further decline and/or bolster its recovery. Additionally, the VSP will provide guidance on the number of populations within an ESU that should be protected and recovered to ensure recovery of the ESU. The HGMP and its Benefit/Risk Assessment provides the framework under which an existing or proposed propagation program may be developed and implemented.

HATCHERY APPENDIX H

Ongoing BPA-funded Supplementation/Artificial Production Experiments

Bonneville Power Administration currently funds a number of projects under the NPPC's Columbia River Basin Fish and Wildlife Program that are intended to answer critical uncertainties related to supplementation and captive propagation. These projects are listed in the table below.

BPA Project #	Title	Subbasin	Objectives	Estimated Completion Date
89-098-00	Idaho Supplementation Studies	Salmon, Clearwater	Evaluate the utility of supplementation as a recovery/restoration strategy for depressed stocks of spring/summer chinook in Idaho. Identify genetic and ecological impacts to existing natural populations.	2007
95-063-25	Yakima/Klickitat Fisheries Project Monitoring and Evaluation	Yakima	Monitor programs in terms of natural production, harvest, genetics, and ecological interactions. Expected outcomes include evaluation of: • Impacts on natural production of targeted stocks. • Ecological impacts on nontarget stocks. • Identification of factors determining success or failure of each program (success is defined as a significant increase in natural production with limited adverse impacts on non-target stocks.) Compare relative survival between different experimental groups of hatchery fish (NATURES vs. conventional rearing) and between hatchery fish and wild conspecifics	2010 - 2020 2005
93-056-00	Research on Captive Broodstock Programs for Pacific Salmon	System-wide	Improve effectiveness and assess risks of captive broodstock programs as a tool for recovery of depleted salmon stocks.	2005
91-071-00	Redfish Lake Sockeye Salmon Captive Broodstock Program	Salmon	Establish captive broodstocks for Redfish Lake sockeye salmon to conserve genetics and begin rebuilding. Conduct M&E of program, including nursery lake rearing habitat, supplementation options, and fish culture.	2005
97-001-00	Captive Rearing Initiative for Salmon River Chinook Salmon	Salmon	Develop captive rearing techniques for spring/summer chinook salmon and evaluate the success and utility of captive rearing for maintaining stock structure and minimum number of adult spawners in three drainages.	2005
98-010-01	Grande Ronde Basin Captive Broodstock Program	Grande Ronde	Implement captive broodstock programs for Snake River spring/summer chinook salmon and associated research, monitoring, evaluation, and fish health monitoring for spring chinook populations in three drainages.	2010