

June 1986

QUANTIFICATION OF HUNGRY HORSE RESERVOIR WATER LEVELS NEEDED TO MAINTAIN OR ENHANCE RESERVOIR FISHERIES

APPENDICES

Annual Report 1986



DOE/BP-12659-4



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QUANTIFICATION OF HUNGRY HORSE RESERVOIR WATER LEVELS
NEEDED TO MAINTAIN OR ENHANCE RESERVOIR FISHERIES
APPENDICES

Annual Report
1986

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June 1987

Appendix B1. Continued, Murry Area 1955

Month	Number of Samples	Daphnia Pulex	Daphnia Non-pulex	Bosmina	Leptodora	Total Cladocerans	Diaptomus	Cyclops	Epischura	Total Copepods	Total Zooplankton
<u>Number</u>											
May	9	2(<1)	11(<1)	41 (1)	0 (0)	54 (2)	1593(54)	1317(44)	3(<1)	2913(98)	2967
June	12	51 (1)	235 (4)	413 (7)	0 (0)	693(12)	2555 (43)	2633(45)	14(<1)	5262 (88)	5961
July	15	639 (4)	1823(12)	6371(14)	0 (0)	9333(59)	2804 (18)	3543(63)	17(< 1)	6370(41)	15703
August	12	665 (7)	2431(25)	1281(13)	0 (0)	4377(45)	2213(23)	3183(33)	16(<1)	5417(55)	9794
September	12	745 (9)	2004(24)	265 (3)	0 (0)	3014(37)	1396(17)	3763(46)	8(<1)	5173(63)	8187
October	15	593 (9)	1583(24)	151 (2)	0 (0)	2326(36)	1574(24)	2557(40)	4(<1)	4135(64)	6462
November	6	419(10)	682(16)	202 (5)	0 (0)	1302(31)	1033(25)	1830(44)	2(<1)	2871(63)	4173
Year	81	4 7 5 (6)	1375(17)	1610(19)	0(<1)	3461(42)	1973(24)	2842(34)	10(<1)	4829(58)	8230
<u>Weight</u>											
May	9	0.6(<1)	0.4(<1)	0.7 (1)	0 (0)	1.7 (2)	55.7(56)	42.6(43)	0.2(<1)	98.5(98)	100.2
June	12	4.9 (3)	8.4 (4)	4.0 (2)	0 (0)	17.3 (9)	106.6(56)	64.6(33)	1.8 (1)	173.0(91)	190.3
July	15	89.8(19)	123.2(26)	43.9 (9)	0 (0)	256.9(54)	114.3(24)	97.5(21)	4.2 (1)	216.0(46)	472.9
August	12	113.4(19)	297.2(51)	16.8 (3)	0 (0)	427.4(73)	66.2(11)	84.6(15)	3.9(<1)	154.7(27)	582.1
September	12	134.9(1)	171.9(40)	3.6(<1)	0 (0)	310.4(72)	31.5 (7)	91.4(21)	2.5(<1)	123.0(28)	433.4
October	15	112.9(40)	101.9(35)	1.5(<1)	0 (0)	216.4(75)	33.3(11)	40.6(14)	1.1(<1)	73.9(25)	290.4
November	6	71.2(38)	52.8(28)	2.2 (1)	0 (0)	126.3(68)	31.1(17)	28.4(15)	1< (<1)	59.5(32)	185.9
Year	81	80.3(23)	116.4(34)	12.2 (4)	0 (0)	209.1(61)	66.0 (19)	68.0(20)	2.1(<1)	135.8(40)	344.9

Appendix B1. Continued, Sullivan Area 1985.

Month	Number of Samples	Daphnia Pulex	Daphnia Non-pulex	Bosmina	Leptodora	Total Cladocerans	Diaptomus	Cyclops	Epischura	Total Copepods	Total Zooplankton
<u>Number</u>											
May	4	1(<1)	0 (0)	4 (1)	0 (0)	5 (1)	99(27)	264(72)	0 (0)	363(99)	368
June	6	13 (1)	98 (5)	175 (9)	0 (0)	286(15)	1087(56)	556(29)	4(<1)	1647(85)	1933
July	7	166 (2)	1286(17)	2450(33)	0 (0)	3902(53)	2079(28)	1381(19)	39(<1)	3499(47)	7401
August	6	236 (3)	1604(17)	2005(21)	0 (0)	3845(41)	3295(35)	2239(24)	28(<1)	5562(59)	9407
September	6	298 (6)	888(19)	323 (7)	<1(<1)	1510(32)	454(10)	2729(58)	19 (4)	3202(68)	4712
October	6	721 (9)	2040(25)	446 (5)	0 (0)	3207(39)	742 (9)	4228(52)	10(<1)	4980(61)	8187
November	2	538 (5)	1282(12)	519 (5)	0 (0)	2339(23)	2707(26)	5347(51)	<1(<1)	8054(77)	10393
Year	37	266 (4)	1064(18)	970(16)	<1 (0)	2300(39)	1455(25)	2160(36)	12 (2)	3627(61)	5928
<u>Weight</u>											
May	4	0.1(<1)	0 (0)	0.1(<1)	0 (0)	0.2 (1)	4.5(31)	9.7(67)	0 (0)	14.2(99)	14.4
June	6	1.2 (2)	2.4 (4)	1.8 (3)	0 (0)	5.4(10)	38.4(70)	10.6(19)	0.5 (1)	49.5(90)	54.9
July	7	20.9 (7)	93.9(33)	26.2 (9)	0 (0)	141.0(50)	96.5(67)	42.3(15)	4.7 (2)	143.5(50)	284.5
August	6	45.9(10)	155.5(34)	18.0 (4)	0 (0)	219.4(43)	82.5(18)	54.7(12)	101.1(22)	238.3(52)	457.7
September	6	52.2(28)	85.8(46)	2.2(<1)	0 (0)	140.4(75)	7.1 (4)	39.3(21)	5.9 (3)	46.4(25)	186.9
October	6	97.8(33)	113.8(39)	4.0(<1)	0 (0)	215.6(73)	17.1 (6)	62.4(21)	2.9 (0)	79.6(27)	295.2
November	2	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0
Year	37	35.9(17)	75.7(35)	9.2(<1)	0 (0)	120.9(55)	42.2(19)	36.1(17)	12.1 (6)	95.7(44)	216.7

Appendix B1. Continued, Areas combined 1985. M = Mean, P = percent, Standard deviations are in parenthesis.

Month	Number of Samples	Daphnia Pulex		Daphnia Non-pulex		Bosmina		Leptodora		Total Cladocerans		Diaptomus		Cyclops		Epischura		Total Copepods		Total Zooplankton
		M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	
<u>Number</u>																				
May	19	8 <1 (19)	22 <1 (37)	51 1 (58)		0 0		81 2 (103)		1879 52 (1825)		1654 46 (1505)		1405 39 (3)		3534 98 (3130)			3615 (3199)	
June	24	68 1 (88)	265 5 (248)	427 8 (450)		0 0		760 14 (739)		2378 44 (1269)		2282 42 (1315)		11 <1 (13)		4671 86 (2521)			5431 (3109)	
July	28	518 4 (422)	1815 13 (320)	5291 38 (4539)		<1 0		7624 55 (5451)		2794 20 (1101)		3353 24 (1623)		14 <1 (12)		5161 45 (2529)			13780 (7096)	
August	24	454 5 (383)	2287 25 (636)	1214 13 (1495)		<1 0		3956 43 (1567)		2290 25 (1616)		2936 32 (745)		19 <1 (9)		5244 57 (2770)			9200 (3043)	
September	23	558 8 (330)	1800 24 (851)	294 4 (167)		<1 0		2651 36 (1101)		1157 16 (602)		3549 48 (1365)		10 <1 (7)		4717 64 (1799)			7368 (2750)	
October	27	554 8 (330)	1611 23 (740)	248 4 (162)		0 0		2412 35 (966)		1334 19 (717)		3215 46 (1184)		5 <1 (6)		4553 65 (1211)			6965 (1910)	
November	11	364 7 (324)	711 14 (345)	233 5 (183)		0 0		1309 27 (745)		1228 25 (1055)		2377 48 (1504)		1 <1 (1)		3606 73 (2424)			4915 (3010)	
Year	156	378 5 (376)	1315 17 (1016)	1311 17 (2752)		<1 <1		3004 38 (3478)		1937 25 (1344)		2853 37 (1446)		10 <1 (11)		4799 62 (2328)			7804 (5056)	
<u>Weight</u>																				
May	19	<1 <1 (<1)	<1 <1 (<1)	<1 <1 (<1)		0 0		2.2 2 (3)		64.2 53 (75.2)		53.9 47 (51)		<1 <1 (<1)		118.3 98 (117.2)			120.6 (118.5)	
June	24	6.1 3 (7.8)	8.6 5 (8.6)	3.9 2 (4.1)		0 0		18.7 10 (19.0)		103.5 58 (73.9)		55.6 31 (32.5)		1.3 <1 (1.6)		160.4 90 (100.6)			179.2 (115.1)	
July	28	66.2 14 (71.3)	136.0 28 (91.5)	57.5 12 (61.6)		0 0		259.8 53 (173.8)		120.8 25 (51.3)		105.2 22 (75.4)		2.8 <1 (2.4)		228.8 47 (119.7)			488.7 (257.1)	
August	24	74.4 14 (73.0)	269.2 52 (183.5)	13.8 3 (18.6)		0 0		357.4 69 (189)		62.6 12 (39.9)		75.1 15 (21.7)		19.2 4 (44.2)		157.0 31 (53.1)			514.4 (170)	
September	23	93.9 25 (68)	171.9 47 (115.2)	3.3 <1 (2.2)		0 0		269.2 73 (130.6)		23.8 6 (14.2)		72.9 20 (42.6)		3.2 <1 (2.3)		100.0 27 (52.3)			369.2 (165.1)	
October	27	92.1 33 (62.8)	96.9 35 (50.4)	2.5 <1 (1.6)		0 0		191.6 69 (89.6)		28.3 10 (15.2)		54.8 20 (24.7)		1.3 <1 (1.7)		84.5 31 (24.8)			276.1 (88.2)	
November	11	43.3 34 (58.4)	36.5 29 (26)	1.6 1 (1.2)		0 0		81.5 65 (76.5)		21.4 17 (15.6)		22.3 18 (11.6)		<1 <1 (<1)		44.0 35 (26.4)			125.6 (100.5)	
Year	156	57.2 18 (67.1)	112.0 35 (130)	14.2 4 (33.8)		0 0		183.4 57 (174.8)		65.0 20 (60.5)		67.3 21 (48.7)		4.4 1 (18.2)		136.8 43 (97.7)			320.2 (218)	

Appendix B2. Continued, Muray Area, 1986.

Month	Number of Samples	Daphnia Pulex	Daphnia Non-pulex	Bosmina	Leptodora	Total Cladocerans	Diaptomus	Cyclops	Epischura	Total Copepods	Total Zooplankton
						Number					
April	3	32	158	36	0	226	2853	1618	0	4471	4696
May	5	33	596	61	0	690	4010	2074	2	6086	6776
June	5	177	1342	151	0	1670	6872	2157	53	9103	10770
July	6	395	2343	2032	<1	4779	2889	4055	8	6942	11710
August	6	326	2245	3504	<1	6076	405	4616	25	5017	11123
September	6	422	1508	1082	<1	3013	717	4725	7	5449	8462
October	6	294	1240	320	<1	1854	910	4915	7	5832	7636
November	6	301	749	129	0	1179	1651	3271	1	4923	6102
December	3	172	322	41	0	535	1688	2200	1	3889	4424
Year	47	258	1282	931	<1	2471	2371	3494	13	5878	8349
						Weight					
April	3	7.1	10.2	0.9	0	13.2	123.7	70.3	0.0	134.0	212.2
May	6	6.1	32.7	1.1	0	39.3	90.8	64.8	0.1	155.5	195.5
June	5	25.2	69.3	1.5	0	96.0	253.6	73.9	8.7	336.3	432.3
July	6	38.0	240.8	18.5	0	297.2	80.5	140.7	2.7	223.9	521.1
August	6	55.8	260.2	40.3	0	356.2	12.7	126.4	8.4	147.4	503.6
September	6	85.2	158.1	12.9	0	256.2	21.6	97.4	2.2	121.1	377.3
October	6	56.3	161.1	3.6	0	221.0	35.5	97.0	1.9	134.4	355.5
November	6	67.7	95.8	1.6	0	165.1	44.6	75.5	0.3	120.4	285.4
December	3	44.9	42.1	0.6	0	87.6	45.6	46.0	0.3	92.0	179.6
Year	47	45.4	131.8	10.2	0	187.5	74.3	92.1	2.9	163.3	356.8

Appendix B2. Continued, Sullivan Area, 1986.

Month	Number of Samples	Daphnia Pulex	Daphnia Non-pulex	Bosmina	Leptodora	Total Cladocerans	Diaptomus	Cyclops	Epischura	Total Copepods	Total Zooplankton
<u>Number</u>											
April	3	5	13	14	0	32	954	579	0	1533	1565
May	6	<1	2	1	0	3	281	64	23	368	372
June	5	12	49	59	0	119	1140	67	85	1291	1411
July	5	62	555	835	0	1452	1344	605	5	1954	3406
August	6	122	2095	3425	2	5643	506	1833	35	2374	8017
September	6	113	1544	1677	1	3335	495	2375	9	2878	6213
October	6	169	1081	462	0	1712	1076	3562	9	4647	6359
November	6	442	908	162	0	1513	3136	5457	4	8597	10100
December	3	543	1053	80	0	1677	7752	3211	5	10960	12640
Year	46	154	869	850	<1	1874	1554	2054	20	3629	5503
<u>Weight</u>											
April	3	1.9	0.9	0.3	0	3.1	47.9	21.8	0.0	69.8	72.9
May	6	0	0.1	<0.1	0	0.1	17.0	2.5	0.6	20.1	20.2
June	5	1.5	2.3	0.5	0	4.4	66.6	2.3	7.3	76.1	80.5
July	5	7.1	28.1	8.1	0	43.2	31.6	25.2	0.8	57.6	100.8
August	6	19.1	108.8	30.0	0	157.8	18.8	59.7	5.8	84.4	242.2
September	6	16.8	204.9	19.5	0	241.2	24.6	55.4	2.8	82.7	324.0
October	6	27.4	153.3	4.8	0	185.5	57.3	81.2	2.9	141.4	326.9
November	6	62.9	84.5	2.3	0	149.7	138.9	125.7	1.1	265.7	415.4
December	3	80.7	125.4	1.0	0	207.1	287.3	73.8	1.3	362.4	569.4
Year	46	22.8	83.5	8.4	0	114.7	66.0	51.6	2.7	120.2	234.9

