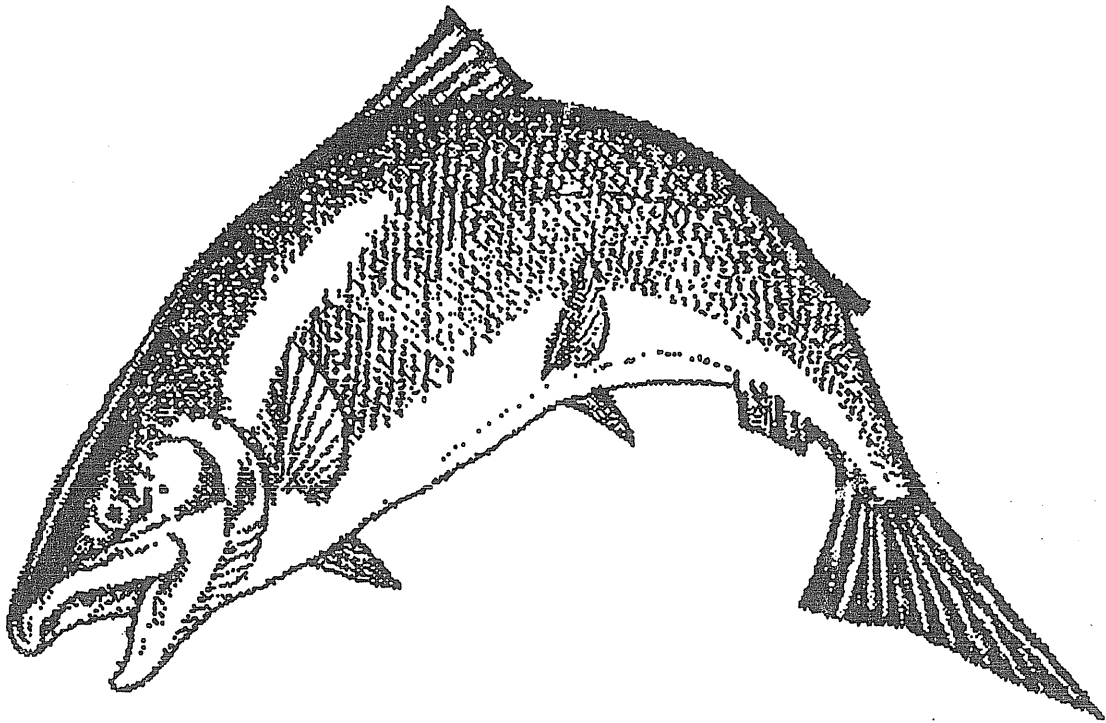


TRENT STICKELL
MARCH 26-27, 1992

Mid-Columbia District Fish Stock Status Review



Prepared By

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Steve Pribyl

FISH STOCK STATUS REVIEW

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FISH STOCK STATUS REVIEW
Central Region Fish Management Meeting
March 26-27, 1992

District	Mid-Columbia
Basin	Hood
Species	Coho
Status	Sensitive Species - Critical

Previous Assessment

Adult trapping at Powerdale Dam (R.M. 4.0) from 1963-71 showed an annual escapement of 130-330 fish (Table 1).

The average annual in-river sport harvest, based on salmon/steelhead tag returns is less than five fish (Table 2). Harvest is generally incidental to the steelhead fishery.

Little information is available on recent status of this population. It is assumed that production occurs throughout the basin.

Most Recent Findings

A cursory spawning survey conducted by Columbia Region personnel during the late fall-early winter 1991 revealed 6 wild/natural coho spawning in the mainstem Hood River downstream from Powerdale Dam and 3 redds.

Actions

The Hood River Fish Management Plan will be completed this year. This plan includes a spawning escapement goal of 500 fish.

Proposed screening of a 135 cfs diversion from the East Fork Hood River has received a high statewide priority listing.

The Northwest Power Planning Council will make a final decision on the Hood River Master Plan in April, 1992. A favorable decision would result in the development of an upstream migrant trapping facility at Powerdale Dam, which would assist in monitoring the status of this population.

**Current
Assessment**

This population size is likely near the 300 individual level, but accurate population data is not available.

This population provides little instream sport angling opportunity, but does likely contribute to out-of-basin sport and commercial fisheries.

Table 1. Escapement of adult coho past Powerdale Dam, 1963-1971.

Year	Escapement
1963	143
1964	346
1965	130
1966	330
1967	257
1968	285
1969	174
1970	282
1971	299

Table 2. Sport harvest of coho in the Hood River drainage 1977-1989. Estimates are from punch card returns (adjusted for non-response bias).

Year	Sport Catch
1977	4
1978	6
1979	6
1980	0
1981	0
1982	6
1983	0
1984	3
1985	4
1986	15
1987	0
1988	4
1989	8

FISH STOCK STATUS REVIEW
Central Region Fish Management Meeting
March 5-6, 1992

District Mid-Columbia
Basin Hood
Species Searun Cutthroat
Status Sensitive Species - Critical

Previous Assessment

The population status is unknown and no angler harvest information is available.

Trapping at Powerdale Dam (R. M. 4.0) from 1962-71 showed an annual escapement of 8-177 fish (Table 1).

It is assumed that historically this population occurred primarily in the East Fork and mainstem Hood River and tributaries.

Big Creek stock searun cutthroat were released as smolts from 1985-87. Numbers stocked ranged from 11,600 - 17,328. Alsea River smolts were released from 1975-77. Numbers stocked ranged from 23,100-33,000 (Table 2).

Most Recent Findings

Unverified reports are received from anglers who catch an occasional searun cutthroat in Hood River.

Budget limitations have precluded any inventory in the Hood Basin for searuns.

Actions

The Hood River Fish Management Plan will be completed this year.

The Hood River Master Plan will be considered for final approval by the Northwest Power Planning Council in April, 1992. Approval of this plan would lead to the construction of an upstream migrant trap, adult holding facilities, and juvenile acclimation ponds adjacent to Powerdale Dam.

In 1980 the trout season opener was moved to late May with an eight inch minimum length to provide additional protection for downstream migrants.

**Current
Assessment**

It is assumed that this population is well below 300 individuals, if not extirpated.

Restoration or re-establishment of this population would help to provide a diversity of angling opportunities in the Hood Basin.

Table 1
Searun Cutthroat Counts at Powerdale Dam
1962-1971

<u>Year</u>	<u>Escapement</u>
1962	8
1963	27
1964	17
1965	27
1966	57
1967	101
1968	134
1969	177
1970	18
1971	45

Table 2

SEARUN CUTTHROAT HATCHERY SUPPLEMENTATION

Hood River				
Year	Brood Stock	Number	Size (fish/lb)	Release site
1955	?	538	1.3	Kingsley Res.
1973	Nestucca	5,007	2.5-3.0	Neal Creek
1973	Nestucca	24,003	2.5-3.5	East Fork H.R.
1974	Alsea	4,019	3.5-4.2	Neal Creek
	Alsea	24,149	3.2-4.2	East Fork H.R.
1975	Alsea	6,998	3.0-4.1	Neal Creek
	Alsea	25,951	3.0-4.2	East Fork H.R.
1976	Alsea	5,001	3.0-4.8	Neal Creek
	Alsea	18,109	3.0-4.8	East Fork H.R.
1977	Alsea	3,121	3.1	Neal Creek
	Alsea	21,536	3.1	East Fork H.R.
1984	Big Cr.	3,981	2.8	Neal Creek
	Big Cr.	10,949	2.6-2.8	East Fork H.R.
1985	Big Cr.	1,008	2.8	Neal Creek
	Big Cr.	10,625	2.6-2.8	East Fork H.R.
1986	Big Cr.	2,012	3.3	Neal Cr.
	Big Cr.	2,639	3.3	Hood River
	Big Cr.	12,667	2.7-3.3	East Fork H.R.

FISH STOCK STATUS REVIEW
Central Region Fish Management Meeting
March 26-27, 1992

District	Mid-Columbia
Basin	Hood
Species	Bull Trout
Status	Sensitive Species - Critical

Previous Assessment

There is little information on the historic distribution of bull trout in the Hood River Basin.

Some bull trout were trapped on the mainstem Hood River from 1963-71 (Table 1).

The only known population(s) occur in the Middle Fork and Clear Branch Creek (Figure 1). Clear Branch Dam (constructed in the mid-60's) blocked all upstream migration, which isolated a population above this structure.

Population inventory work in 1990 revealed small bull trout populations above and below Clear Branch Dam (Tables 2 and 3).

Most Recent Findings

Cursory spawning ground surveys in recent years by USFS personnel resulted in observations of fish and redds in Clear Branch Creek (1991:16 fish, 2 redds).

A trap net was fished in Laurance Lake (Clear Branch Reservoir) in October 1991 for 48 hours. Seven bull trout ranging from 177 mm to 278 mm were captured.

Actions

An emergency angling regulation was enacted on Laurance Lake in 1991 which required anglers to release all unmarked trout.

Clear Branch above the reservoir was closed to all angling after August 15, to protect spawning bull trout.

Beginning January 1, 1992, Laurance Lake and tributaries are closed to bull trout angling. Anglers can only use artificial flies and lures with barbless hooks. All unmarked trout must be released unharmed.

The USFS has completed instream habitat enhancement of Clear Branch Creek above Laurance Lake (i.e. large woody structures, side channels).

Middle Fork Irrigation District has agreed to install an upstream migrant fish trap at the base of Clear Branch Dam. This facility could be used to pass bull trout above the dam.

The Hood River Fish Management Plan will be completed this year.

**Current
Assessment**

The population size is probably greater than 300 individuals. Hopefully the population will respond to restrictive angling regulations designed to eliminate angler harvest.

Unfortunately budget limitations preclude intensive population sampling (i.e. Powerdale Trap).

Table 1
 Bull Trout Counts - Hood River
 Powerdale Dam 1963-1971

<u>Year</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>
Fish	6	9	3	1	12	9	6	0	1

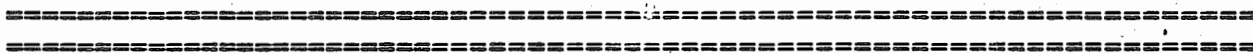


Table 2
 Bull Trout Population Survey
 Clear Branch Creek Above Laurance Lake
 July 20, 1989

<u>Sample Site</u>	<u>No. Fish</u>	<u>Size Range</u>
Beaver Pond	0	--
Side Channel (200 feet)	12	83-132 mm
Main Creek (50 feet)	5	82-140 mm

Note: Based on limited sample and available habitat population may be less than 1,000 individuals.

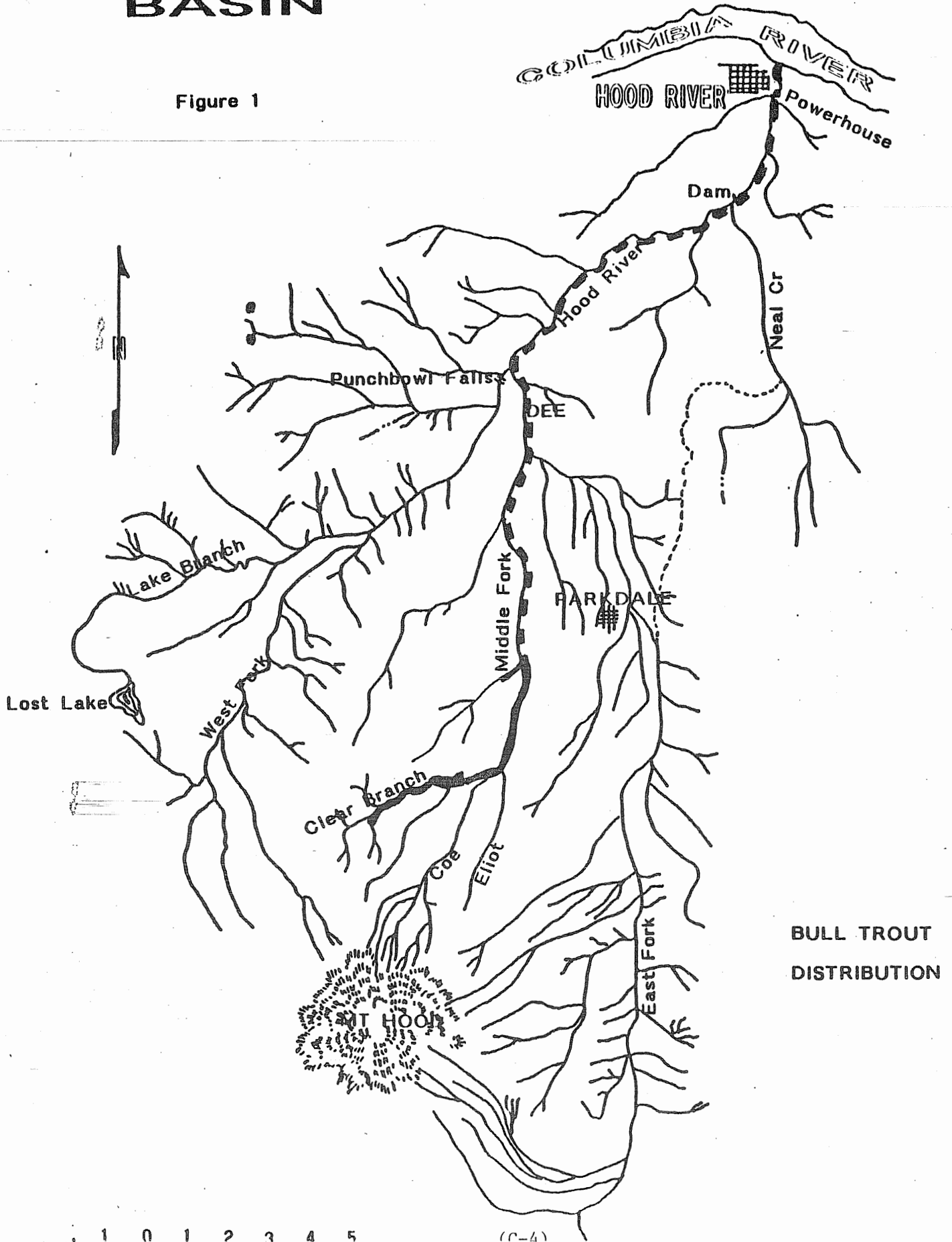


Table 3
 Bull Trout Population Survey 1990
 Clear Branch, Middle Fork Hood River (Below Clear Branch Dam)

<u>Stream</u>	<u>No. Fish</u>	<u>Size Range</u>
Clear Branch	2	1=25-30cm 1=30-35cm
Bear Creek	1	1=30-35cm
Tony Creek	0	-----
Rogers Spring Creek	0	-----

HOOD RIVER BASIN

Figure 1



BULL TROUT
DISTRIBUTION

FISH STOCK STATUS REVIEW
Central Region Fish Management Meeting
March 5-6, 1992

District	Mid-Columbia
Basin	Deschutes
Species	Bull Trout
Status	Sensitive Species - Critical

Previous Assessment

Bull trout are found in the lower Deschutes River (above Sherars Falls), Shitike Creek, and Warm Springs River (Figure 1).

Abundance of bull trout has not been estimated, but appears to be fairly low. A few bull trout were captured annually in the Deschutes River during rainbow trout inventory work (1979-88). It appeared that the Deschutes population was stable or increasing, based on capture frequency during the rainbow sampling.

We speculate most spawning occurs in the Warm Springs River headwaters and Shitike Creek (Table 1 and 2).

Upstream migrant bull trout in the Warm Springs River are counted at Warm Springs National Fish Hatchery (i.e. 3 4-5 lb fish, 1990).

Most Recent Findings

Warm Springs National Fish Hatchery passed two fish above their weir in late July - early August in 1991 (1 - 48cm, 1 - 60cm).

Spring chinook spawning surveys conducted by Warm Springs Tribal biologist in 1991 on the Warm Springs River and Shitike Creek found bull trout and redds (Table 3).

Actions

Restrictive angling gear and bag limits on the Deschutes River have probably significantly reduced harvest (i.e. artificial flies and lures only, barbless hooks, 2 fish per day 10-13 inches only) since 1978.

The Deschutes Fish Management Plan will be completed this year.

Approximately 16 miles of riparian livestock fencing has been installed along the Deschutes River upstream of Sherars Falls in the last ten years. The Warm Springs Tribes are being encouraged to implement riparian management restoration measures on reservation lands bordering the river.

The Lower Deschutes Recreation Plan will be completed this year. This plan identifies riparian habitat protection/restoration as a high priority.

The Warm Springs Tribes have completed stream habitat enhancement projects (i.e. passage improvement, bank stabilization, and instream structures) on Shitike Creek and the Warm Springs River. The Tribal Natural Resource Department staff has been working to reform timber and livestock management activities on reservation lands.

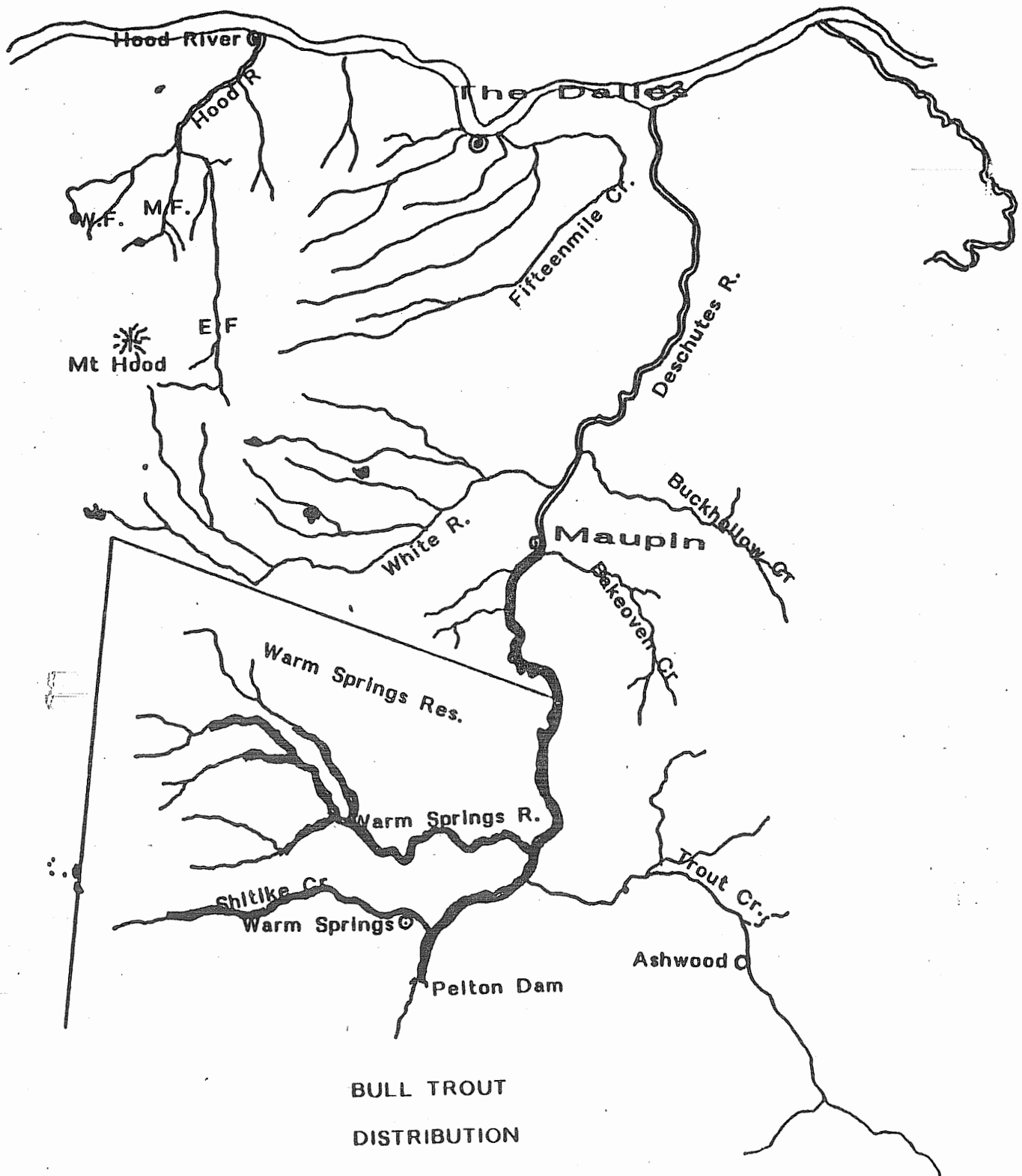
**Current
Assessment**

This population is probably well over 300 individuals. It appears that the population may be favorably responding to restrictive angling regulations and increased public awareness.

Historically this population has not supported a major sport or tribal fishery and likely will not in the near future.

MID-COLUMBIA DISTRICT

Figure 1



BULL TROUT
DISTRIBUTION

TABLE 1
BULL TROUT SPAWNING
SURVEYS, SHITIKE CREEK
1984-1990

<u>Year</u>	<u>Index Area</u>	<u>No. Redds</u>	<u>Date Surveyed</u>	<u>Fish Observed</u>
1984	Peters Pasture (Rkm 34.4 - 35.5)	5	9/27	-
1985	Peters Pasture	2	9/17	-
1986	Peters Pasture	3	9/18	1 Female; 66cm 2 Males; 45cm
	Upper Xing-monitoring	NA	10/21	N=1/63cm
1987	Peters Pasture	3	9/28	-
	Upper Xing-monitoring	NA	8/19	N=1/57.8cm
1988	Peters Pasture	12	9/23	2 Females; 45 & 60cm 2 Males; 20 & 50cm
	Upper Xing-monitoring	NA	8/19	N=2/57.6cm
1989	Upper Xing-monitoring	12	9/15	5 Adults; 30-45cm
	Powerline to Upper Xing (Rkm 16.6-19.8)	6	9/15	--
	Upper Xing-monitoring	NA	8/29	N=4/57.6cm
1990	Peters Pasture	9	9/7&10/3	8 (3=30-35cm, 1=35-40cm, 4=40-45cm)
	Powerline to Upper Xing	6	9/10	0

Table 2
Bull Trout Spawning Survey
Warm Springs River, 1990

<u>Year</u>	<u>Area</u>	<u>No. Redds</u>	<u>Fish Observed</u>	<u>Date Surveyed</u>
1990	Bunchgrass to Schoolie	15	5 (30-35cm)	9/21

Table 3
CONFEDERATED TRIBES OF WARM SPRINGS
1991 BULL TROUT DATA

<u>Year</u>	<u>Area</u>	<u>No. Redds</u>	<u>Fish Observed</u>	<u>Date</u>
1991	Warm Springs River	6/12	2/0 (<25-45 cm)	9/4-17

Shitike Creek

A.	Peter's Pasture	6	3 (<38 cm) 2 (<25 cm)	9/13
B.	Powerline to Upper Crossing	1	-----	9/4
C.	Upper Crossing to Bennett Place	1	-----	9/20

WSNFW

NO INFORMATION

Migrant Trip (W.S.R.)

NO CATCH

c:\wp\mark\btd.91

FISH STOCK STATUS REVIEW
Central Region Fish Management Meeting
March 26-27, 1992

District	Mid-Columbia
Basin	Deschutes
Species	Fall Chinook
Status	Seriously Depressed Wild Population

Previous Assessment

A concise informational report on Deschutes River Fall Chinook was completed by ODFW Research Division in 1988.

ODFW has monitored harvest and passage of fall chinook at Sherars Falls (R.M. 43) annually since 1977.

This wild run has never been supplemented with hatchery fish.

Wild fall chinook adult run size to the Deschutes River ranged between 3,000 and 7,500 from 1977-1989 (Table 1a - average run 5,279)

Combined sport and Indian adult harvest ranged between 800 and 2,400 from 1979-1989 (Table 1a - average harvest 1,679).

Most Recent Findings

Total adult run size to the Deschutes River in 1991 was estimated at 1,060 fish - the lowest on record. This low escapement occurred despite a three and one half month fishing closure for sport and tribal fisheries.

The 1991 catch rate for adults and jacks in the Sherars Falls adult migrant trap was slightly lower than 1990 and was equal to the lowest catch rates for 15 years of record (Table 2 & 3).

An estimated 462 adult fall chinook (95% C.I. 236-1,308) passed above Sherars Falls from June 20 to October 31, 1991. This is the lowest adult escapement since estimates were initiated in 1977.

Jack fall chinook run size for 1991 (Table 4) is nearly identical to the 1990 figure.

A total of 84 adult fall chinook entered the Pelton Trap during 1991. This is greater than the 1990 total of 78 but less than the 5-year average run total of 122 fish.

Redd counts for 1991 are considerably lower than the five year average counts for the river. Two aerial redd count flights were made in 1991. A combination of the highest counts from both flights (Table 5) shows a slightly higher count for the entire river than in 1990, but a slightly lower count on 25.5 miles of predetermined random and index areas than 1990.

Actions

The sport and Indian fisheries in the Deschutes were closed to all chinook harvest from June 15 - September 30, 1991.

In 1982 ODFW began an active program of protecting and enhancing the rivers riparian corridor on state, private, and federal lands. To date approximately 35 miles of livestock exclosure are in place. Riparian habitat in protected areas continues to recover. The new Lower Deschutes River Recreation Plan includes specific actions to improve and protect the important streamside habitat.

The Lower Deschutes Fish Management Plan is nearing completion. This plan includes a run size goal of 10,000-12,000 fish to the river, with a spawning escapement of 6,000-7,000 fish.

The District proposes an emergency closure on Deschutes River fall chinook angling for 1992, with a total angling closure from Sherars Falls downstream to Buckhollow Creek from June 15 - October 31, 1992.

The Sherars Falls adult migrant trap will be operated from June 15 to October 31 to facilitate escapement estimates.

Current Assessment

The number of adult spawners is still above 300 individuals. However, if the current rate of population decline continues the number of adult spawners could fall below 300 by 1993.

Restoration of this run is a high priority for public and tribal interests.

Table 1a. Run size of adult fall chinook salmon in the Deschutes River, 1977-91.

Year	Harvest	Escapement	Run
1977	1,861	5,631	7,492
1978	1,971	4,154	6,125
1979	1,592	3,291	4,883
1980	1,951	2,542	4,493
1981	1,837	3,183	5,020
1982	2,016	4,890	6,906
1983	1,496	3,669	5,165
1984	970	2,025	2,995
1985	807	2,645	3,452
1986	1,153	3,801	4,954
1987	2,057	4,097	6,154
1988	2,391	3,520	5,911
1989	1,730	3,358	5,088
1990	970	1,399	2,369
1991 a/	158	906	1,064

a/ Sport and Indian chinook season closed June 16 - September 30, 1991

Table 1b. Run size of jack fall chinook salmon in the Deschutes River, 1977-91.

Year	Harvest	Escapement	Run
1977	1,672	2,125	3,797
1978	1,597	2,708	4,305
1979	2,000	4,338	6,338
1980	1,507	1,904	3,411
1981	1,294	3,728	5,022
1982	1,506	3,360	4,866
1983	678	859	1,537
1984	987	1,237	2,224
1985	1,454	5,384	6,838
1986	1,428	5,872	7,300
1987	242	1,515	1,757
1988	245	1,859	2,104
1989	150	484	634
1990	140	624	764
1991 a/	59	635	694

a/ Sport and Indian chinook season closed June 16-September 30, 1991

Table 2. Number and catch rate (fish/hour) for fall chinook adults at Sherars Falls Trap, 1977-1991.

Year	6 16-30	7 1-15	7 16-31	8 1-15	8 16-31	9 1-15	9 16-30	10 1-15	10 16-31	Total
1977	14	27	115	177	60	48	304	73	38	856
1978	17	17	69	87	94	137	314	271	35	1,041
1979	7	19	25	42	14	66	291	97	24	589
1980	10	10	11	13	20	81	89	157	29	420
1981	1	12	17	28	48	152	122	118	28	526
1982	--	3	10	11	69	57	64	49	20	283
1983	--	--	--	5	24	41	39	96	23	228
1984	--	--	1	3	14	4	9	7	2	40
1985	--	--	10	13	23	23	20	28	0	117
1986	--	--	20	30	24	26	32	51	15	198
1987	--	--	--	21	38	70	68	90	15	302
1988	0	16	13	16	20	57	140	57	9	328
1989	9	14	9	10	15	17	30	64	37	205
1990	8	6	10	7	7	15	20	15	32	120
1991	3	6	5	8	11	20	16	8	7	84

Year	6 16-30	7 1-15	7 16-31	8 1-15	8 16-31	9 1-15	9 16-30	10 1-15	10 16-31	Aver.
1977	0.57	0.38	1.76	2.19	1.27	1.19	4.15	4.20	1.78	1.94
78	0.30	0.34	0.82	0.69	0.66	0.75	2.65	2.49	0.58	1.28
79	0.10	0.19	0.25	0.41	0.24	0.91	2.97	1.09	0.29	0.76
1980	0.12	0.16	0.10	0.15	0.27	0.96	0.87	1.74	0.36	0.54
1981	0.02	0.14	0.20	0.39	0.52	1.65	1.99	1.18	0.44	0.76
1982	-----	0.09	0.24	0.21	0.81	0.78	0.93	0.59	0.30	0.56
1983	-----	-----	-----	0.11	0.28	0.59	0.56	1.49	0.43	0.59
1984	-----	-----	0.10	0.04	0.20	0.08	0.19	0.16	0.04	0.12
1985	-----	-----	0.16	0.15	0.28	0.28	0.31	0.36	0	0.25
1986	-----	-----	0.180	0.37	0.28	0.26	0.42	0.52	0.15	0.31
1987	-----	-----	-----	0.38	0.56	0.97	0.89	1.38	0.33	0.79
1988	0	0.22	0.17	0.19	0.24	0.82	1.41	1.15	0.16	0.52
1989	0.12	0.22	0.11	0.15	0.17	0.20	0.36	0.93	0.42	0.29
1990	0.10	0.08	0.11	0.10	0.10	0.21	0.22	0.18	0.34	0.16
1991	0.05	0.08	0.06	0.12	0.15	0.27	0.17	0.10	0.08	0.12

Table 3. Number and catch rate (fish/hour) for fall chinook jacks at Sherars Falls Trap, 1977-1991.

Year	6 16-30	7 1-15	7 16-31	8 1-15	8 16-31	9 1-15	9 16-30	10 1-15	10 16-31	Total
1977	1	4	9	22	19	48	150	17	11	281
1978	1	0	3	9	12	18	101	135	16	295
1979	1	1	14	28	8	67	277	122	5	523
1980		1	10	9	17	60	110	173	9	389
1981	1	4	11	14	32	116	171	79	19	477
1982	--	0	0	1	19	22	31	28	9	110
1983	--	--	--	0	5	5	14	30	4	58
1984	--	--	0	0	2	5	1	4	2	14
1985	--	--	1	4	7	15	14	45	1	87
1986	--	--	6	5	5	16	13	20	3	68
1987	--	--	--	15	19	47	37	36	3	157
1988	0	2	3	6	22	49	92	42	6	222
1989	1	1	8	4	12	5	16	38	35	120
1990	0	1	1	7	2	12	14	15	19	71
1991	0	2	0	3	12	27	38	26	16	124

Year	6 16-30	7 1-15	7 16-31	8 1-15	8 16-31	9 1-15	9 16-30	10 1-15	10 16-31	Aver.
1977	0.04	0.06	0.14	0.27	0.40	1.19	2.05	0.98	0.52	0.64
78	0.02	0	0.04	0.07	0.08	0.17	1.25	1.24	0.15	0.36
79	0.01	0.01	0.14	0.27	0.14	0.93	2.83	1.37	0.06	0.68
1980	0	0.02	0.09	0.11	0.23	0.71	1.08	1.92	0.11	0.50
1981	0.02	0.05	0.13	0.20	0.34	1.26	2.79	0.76	0.30	0.64
1982	-----	0	0	0.02	0.22	0.30	0.45	0.34	0.14	0.22
1983	-----	-----	-----	0	0.06	0.07	0.20	0.47	0.07	0.15
1984	-----	-----	0	0	0.03	0.09	0.02	0.09	0.04	0.04
1985	-----	-----	0.02	0.07	0.08	0.19	0.22	0.58	0.05	0.18
1986	-----	-----	0.06	0.06	0.06	0.16	0.17	0.20	0.03	0.11
1987	-----	-----	-----	0.27	0.28	0.65	0.48	0.55	0.07	0.41
1988	0	0.03	0.04	0.07	0.26	0.71	0.93	0.85	0.11	0.35
1989	0.01	0.02	0.10	0.06	0.13	0.06	0.19	0.55	0.40	0.17
1990	0	0.01	0.01	0.10	0.03	0.17	0.15	0.18	0.20	0.10
1991	0	0.01	0	0.04	0.16	0.37	0.41	0.31	0.19	0.18

Table 4. Run size of jack fall chinook salmon in the Deschutes River, 1977-91.

Year	Harvest	Escapement	Run
1977	1,672	2,125	3,797
1978	1,597	2,708	4,305
1979	2,000	4,338	6,338
1980	1,507	1,904	3,411
1981	1,294	3,728	5,022
1982	1,506	3,360	4,866
1983	678	859	1,537
1984	987	1,237	2,224
1985	1,454	5,384	6,838
1986	1,428	5,872	7,300
1987	242	1,515	1,757
1988	245	1,859	2,104
1989	150	484	634
1990	140	624	764
1991 a/	59	635	694

a/ Sport and Indian chinook season closed June 16-September 30, 1991

Table 5. Fall chinook spawning ground counts, Deschutes River, 1974-91.

Stream	Date Surveyed	Miles	Redds	Remarks	Redds/mile Year 5-year Aver. Aver.	
Deschutes River	1991	100.0	194	/1		
	1991	25.5	98	/1	3.8	7.8
	1990	100.0	183	/4		
	1990	25.5	101	/3	4.0	9.2
	1989	100.0	682	/4		
	1989	25.5	324	/1	12.7	10.2
	1988	25.5	236	/1	9.3	11.9
	1986	25.5	229	/2	9.0	19.2
	1985	25.5	285	/1	11.1	19.8
	1983	25.5	229	/1	9.0	25.8
	1981	25.5	538	/3	20.3	30.5
	1980	25.5	787	/3	21.1	31.6
	1979	25.5	650	/3	23.9	32.4
	1978	25.5	366	/3	14.4	
	1977	25.5	988	/2	38.7	
	1976	25.5	1,139	/1	44.7	
	1975	25.5	926	/2	36.3	
	1974	25.5	716	/1	28.1	

- /1 October-November counts combined
- /2 October counts only
- /3 November counts only
- /4 Total count-November

FISH STOCK STATUS REVIEW
Central Region Fish Management Meeting
March 26-27, 1992

District	Mid-Columbia
Basin	Hood
Species	Winter Steelhead
Status	Seriously Depressed

Previous Assessment

ODFW began periodic supplementation of this population with hatchery releases in 1962. Big Creek origin smolts have been released annually since 1985, with numbers ranging from 20,000-40,000.

Assuming that sport harvest is an index of run size, the population has declined dramatically in the last 10 years (Table 1).

There is little quantitative or qualitative biological or life history information available.

Most Recent Findings

An adult migrant fish trap was installed at Powerdale Dam (R.M. 4.0) in mid-December 1991.

Preliminary trap data indicates that Big Creek origin hatchery adults comprise approximately 75 percent of the winter run. The wild run appears to be very low.

Scale analysis for 41 wild steelhead revealed 1-3 years fresh water rearing and 10% repeat spawners.

360 steelhead were counted through the trap by March 1, 1992 (253 marked, 107 unmarked). 37% of the fish (n=132) carried predator scars (i.e. seal marks).

Actions

A volunteer angler brood collection program was initiated during the 1990-91 run. Three wild females were spawned. Their progeny will be released into Hood River in April 1992.

Big Creek origin StW smolt releases were discontinued following the 1990 releases.

Beginning January 1, 1992 all unmarked (wild) Hood River steelhead must be released unharmed. Barbless hooks are required.

Wild (natural) adults collected at the Powerdale Dam Trap will be spawned from throughout the 1991-92 run to provide up to 45,000 eggs and 30,000 smolts for 1993 release.

The Hood River Fish Management Plan will be completed this year. Included in this plan is a run-size goal of 5,000 fish to the river, with spawning escapement of 2,500 fish.

The Hood River Basin Master Plan will be considered for final approval by the Northwest Power Planning Council in April 1992. Approval of the plan would lead to development of adult trapping, sorting, and holding facilities, as well as acclimation ponds adjacent to Powerdale Dam.

**Current
Assessment**

The wild run size is likely below 300 individuals. Development of a Hood River brood stock to supplement the depressed population and new restrictive angling regulations may help to reverse the downward population trend.

Both tribal and sport fishermen are interested in rebuilding this depressed population.

Population recovery may ultimately depend on needed revisions to the Columbia River, Zone 6, winter gillnet fishery. This fishery primarily targets steelhead, including this depressed population.

Table 1. Sport harvest of winter steelhead in the Hood River drainage, 1977-1978 through 1989-1990 run years. Estimates are from punch-card returns (adjusted for non-response bias)

Run Year	Sport Catch
1977-78	1,593
1978-79	860
1979-80	1,258
1980-81	2,451
1981-82	1,690
1982-83	1,053
1983-84	383
1984-85	578
1985-86	591
1986-87	713
1987-88	835
1988-89	417
1989-90	684

FISH STOCK STATUS REVIEW
Central Region Fish Management Meeting
March 26-27, 1992

District Mid-Columbia
Basin Fifteenmile Creek
Species Winter Steelhead
Status Seriously Depressed

Previous Assessment

Fifteenmile Creek supports the eastern most wild winter steelhead population in the Columbia Basin.

It is believed that there is approximately 91 stream miles of suitable spawning habitat and 44 stream miles of suitable rearing habitat.

No hatchery steelhead have ever been released into this drainage.

Very little quantitative or qualitative life history information exists on this population.

Most Recent Findings

Spawning ground surveys conducted during 1991 produced lower numbers of redds than those observed in recent years (Table 1). One index area could not be surveyed because of high water turbidity associated with runoff from agricultural land.

Actions

Spawning adults were observed in stream segments on the Mt. Hood National Forest, for the first time in many years in 1991.

This stream system has undergone significant instream and riparian restoration/enhancement work since 1975. A BPA funded project is currently underway.

The Fifteenmile Creek Fish Management Plan will be completed this year. The run-size goal to Fifteenmile Creek is 1,800 fish, with a spawning escapement goal of 900 fish, and 600 fish available for harvest.

Beginning January 1, 1992 the general trout angling season opener was delayed until late May, to provide additional protection for wild smolts.

An ODFW minimum streamflow for Fifteenmile Creek has been converted to an instream water right.

**Current
Assessment**

The run size is likely below 300 individuals. Hopefully the population will increase as the result of enhanced adult passage, instream and streamside habitat enhancement, as well as protective fish screening.

Ultimately the fate of this population may hinge on needed revisions to the Columbia River, Zone 6, winter gillnet fishery.

This population has been important to sport and tribal fishermen.

Table 1. Winter steelhead redd counts, Fifteenmile system.

FIFTEENMILE CREEK

Year	Reach	Distance	Redds	Redds/Mile
1964	Dufur Valley	5.0	87	17.4
1966	Dufur Valley	5.0	20	4.0
1967	Dufur Valley	5.0	32	6.4
1968	Dufur Valley	5.0	23	4.6
1970	Dufur Valley	5.0	2	0.4
1984	Dufur Valley	14.0	24	4.8
1985	USFS-Dufur	14.0	29	2.1
1986	USFS-Dufur	14.0	64	4.0
1987	USFS-Dufur	14.0	76	5.4
1988	USFS-Dufur	14.0	28	2.0
1990	City Intake-Dufur	9.5	38	4.0
1991	USFS-Dufur	17.5	26	1.5

EIGHTMILE CREEK

Year	Reach	Distance	Redds	Redds/Mile
1985	RM 10.8-19.0	8.2	64	7.8
1986	RM 10.8-19.0	8.2	111	13.5
1987	RM 10.8-19.0	8.2	102	12.4
1988	RM 10.8-19.0	8.2	18	2.7
1990	RM 10.0-19.0	9.0	41	4.5
1991	RM 24.5-29.0	4.5	0	0

RAMSEY CREEK

Year	Reach	Distance	Redds	Redds/Mile
1985	RM 0.0-9.8	9.8	3	0.3
1986	RM 0.0-9.8	9.8	31	3.7
1987	RM 0.0-9.8	9.8	47	4.8
1988	RM 0.0-9.8	9.8	23	2.4
1990	RM 0.0-9.8	9.8	12	1.2
1991	RM 0.0-9.8	9.8	3	0.3

FISH STOCK STATUS REVIEW
Central Region Fish Management Meeting
March 26-27, 1992

District	Mid-Columbia
Basin	Deschutes
Species	Summer Steelhead
Status	Depressed

Previous Assessment

We have more than twenty years of extensive data on this population, including: life history, harvest, and escapement. This information has been summarized in a draft information report being developed by the Research Division for the last fifteen years.

Escapement estimates for wild and hatchery summer steelhead passing Sherars Falls from 1982-1990 have ranged from 3,600-9,600 and 4,800-17,600 respectively (Table 1).

Estimated escapement of Round Butte Hatchery origin adults above Sherars Falls from 1982-1990 has ranged from 2,000 to 9,200. While the escapement of out-of-basin hatchery stray adults for the same period has ranged from 2,800 to 9,800 (Table 1).

The wild steelhead escapement estimates above Sherars Falls declined dramatically following the 1985-86 run.

ODFW has released approximately 162,000 smolts annually from Round Butte Hatchery since 1973.

Sport anglers have been required to use barbless flies and lures only and release all wild fish since 1979.

Most Recent Findings

1,116 summer steelhead entered the Pelton Trap during the 1990-91 run year. This count is less than one half of the 5-year average count of 2,274. Round Butte Hatchery origin steelhead made up 54.2% (n=606) of the total count, while hatchery strays accounted for 38.4% (n=428) of the total (Figure 1).

The 1990-91 run escapement estimate for fish passing above Sherars Falls (n-8529) is the lowest estimate on record (Table 1)

Monitoring of the sport harvest at the mouth of the Deschutes and catch rate of steelhead at the Sherars Falls Trap indicate that the 1991-92 run was somewhat larger than the 1990-91 run. [Final escapement estimates for the 1991-92 run will not be available until June].

Two-salt Round Butte Hatchery adults made a poor showing in 1991. Their one-salt counterparts made up 60 percent of the Round Butte Hatchery adults observed in the Sherars Trap (Table 2).

1991 angler success was much improved over 1990 and may have been the best angling season in the last five years (Table 3). On the average anglers fished 10.8 hours to land a steelhead in 1991, compared with 21.9 hours per fish landed in 1990.

A three-mile section of river from Sherars Falls downstream was closed to all sport and Indian fishing from June 16 to September 30, 1992 (Figure 2).

Actions

The Lower Deschutes River Fish Management Plan will be completed this year. This plan includes a run size goal of 16,000-22,000 fish to the river, with a spawning escapement of 10,000 natural spawners and 600-1,000 hatchery brood.

Budget limitations preclude a complete harvest monitoring program. However, the sport fishery at the Deschutes River mouth will likely be monitored during the 1992 season.

The Sherars Falls adult migrant trap will be operated from June 15-October 31. This facility provides important data used to calculate upstream escapement.

An extensive stream habitat enhancement project, funded by BPA is nearing completion on Trout Creek and tributaries. Approximately 35 miles of riparian livestock exclosures have been installed along the river in the past ten years.

BPA funded habitat enhancement projects are proposed for Bakeoven and Buckhollow creeks. The Wasco and Sherman County SWCD's are initiating a complete

watershed restoration project on Buckhollow Creek.

**Current
Assessment**

The current escapement of wild steelhead is well above 300 individuals. However, straying of out-of-basin hatchery and wild steelhead will likely require that this population be exempted from the Wild Fish Management Policy. When considering returning Round Butte Hatchery adults spawning in the wild, the potential compliance with the WFMP is extremely remote.

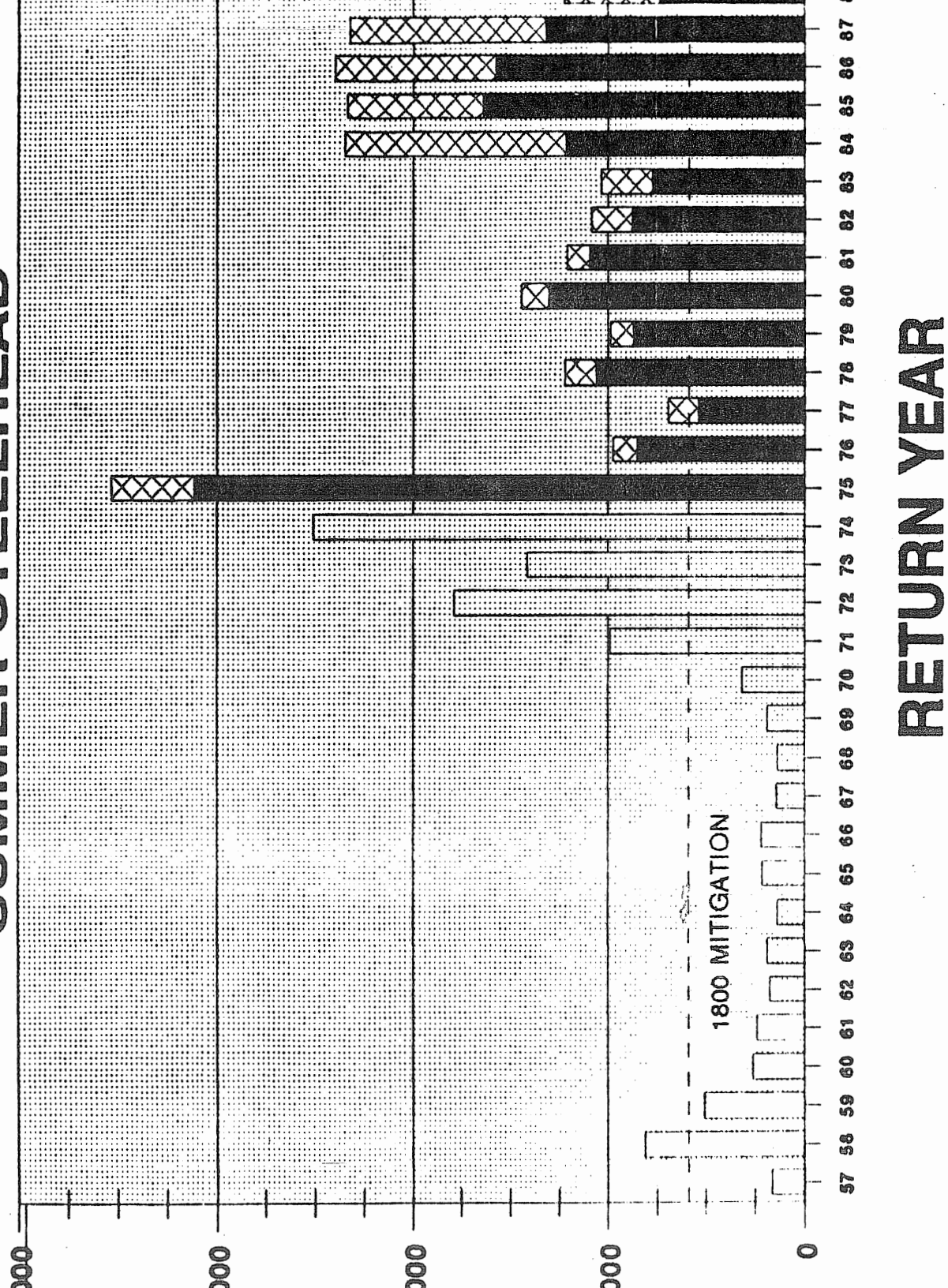
This is an important fishery for sport and tribal fishermen.

Table 1. Population estimates of summer steelhead escapement over Sherars Falls, Deschutes River by run year, 1982-91.

Run Year	Hatchery Component			
	Wild	Total Hatchery	Round Butte	Strays
82-83	6,567 (4,453-10,104)	4,773 (3,998-5,698)	3,524 (2,883-4,307)	-- --
83-84	8,228 (6,439-10,493)	15,443 (13,620-17,513)	7,250 (6,157-8,533)	7,684 (6,324-9,337)
84-85	7,721 (5,572-11,031)	11,770 (9,997-13,855)	7,563 (6,347-9,174)	3,824 (2,630-5,781)
85-86	9,624 (7,171-14,066)	12,106 (10,745-13,747)	7,382 (6,806-7,985)	5,056 (3,930-6,758)
86-87	6,207 (5,025-7,669)	18,358 (16,579-20,324)	9,064 (7,989-10,281)	9,803 (8,259-11,627)
87-88	5,367 (3,774-7,940)	17,623 (14,804-20,979)	9,209 (7,571-12,250)	8,367 (6,483-10,786)
88-89	3,546 (2,756-4,741)	6,336 (5,647-7,163)	3,849 (3,389-4,410)	2,909 (2,257-3,898)
90-91	3,653 (2,572-5,372)	4,876 (4,230-5,618)	1,990 (1,636-2,480)	2,852 (2,328-3,493)

FIGURE 1

PELTON TRAP CATCH SUMMER STEELHEAD



■ RBH RETURN ▨ STRAY & WILD ▩ RBH, STRAYS & WILD

Return year indicates end of run year (91='90-'91 run)

Table 2. Number of hatchery summer steelhead captured at the Sherars Falls Trap, by mark, 1991

<u>Mark</u>	<u>Mark Code</u>	<u>Number Captured</u>	<u>Origin</u>
ADRM	39	175	Round Butte 1 salt
ADLM	38	75	Round Butte 1 salt (wild x wild)
ADLPLM	368	79	Round Butte 2 salt
ADRPLM	378	67	Round Butte 2 salt
ADRPRM	379	21	Round Butte 2 salt (wild x wild)
AD	3	577	Stray
ADLV	34	96	"
ADLVRV	345	53	"
ADLVLP	346	2	"
ADLVRP	347	4	"
ADLVLM	348	1	"
ADLVRVLP	3456	1	"
ADLVRVRP	3457	1	"
ADLVRVLPRP	34567	4	"
ADRV	35	30	"
ADRVLP	356	1	"
ADRVRP	357	1	"
ADRVLM	358	4	"
ADLP	36	24	"
ADLPRP	367	12	"
ADRP	37	47	"
PLM	68	2	"
M	08	1	"

Table 3. Deschutes River summer steelhead sport catch data. 1981-1991.

year	Fish Landed/ Angler	Fish Killed/ Angler	Hours/Fish Landed	W:H
1981	0.58	0.14	12.5	--
1982	0.52	0.11	12.5	--
1983*	0.72	0.18	09.1	--
1984*	0.86	0.18	10.0	--
1985*	0.87	0.23	12.5	--
1986*	1.46	0.32	06.7	1.94:1
1987	0.61	0.12	11.0	4.08:1
1988*	0.27	0.09	28.3	3.30:1
1989	0.40	0.14	16.1	1.93:1
1990	0.28	0.12	21.9	1.31:1
1991	0.56	0.21	10.8	1.68:1

* not all statistically expanded creel.

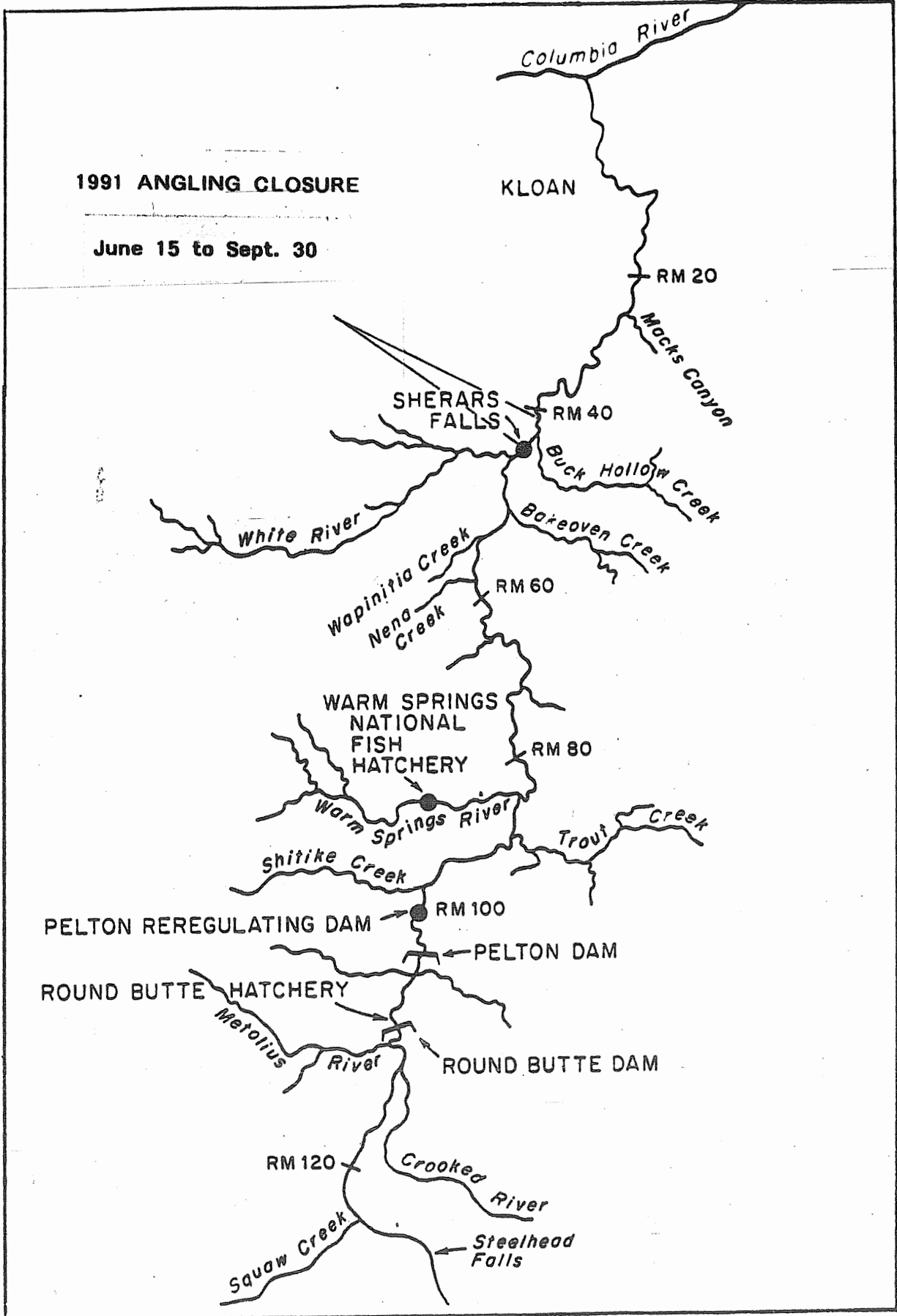


Figure 1. The Deschutes River below Steelhead Falls (RM 128).

Figure 2.

FISH STOCK STATUS REVIEW
Central Region Fish Management Meeting
March 26-27, 1992

District Mid-Columbia
Basin Deschutes
Species Spring Chinook
Status Stable

Previous Assessment

The Deschutes River supports one of the few remaining wild spring chinook populations in the Columbia Basin.

A concise Deschutes River Spring Chinook Information Report was completed by ODFW Research Division in 1989.

The escapement of wild spring chinook (adults plus jacks) ranged from 1,000 to 2,600 from 1977 to 1990 (Table 1 -average escapement 1578).

ODFW first released Deschutes River spring chinook (81,080) in 1966. The Warm Springs Confederated Tribes received some eggs and fry from other stocks for release into the Warm Springs River Basin from 1957-1970 (Table 2).

ODFW began rearing a portion of the Round Butte Hatchery spring chinook production in the Pelton Fish Ladder in 1980. Round Butte Hatchery releases have averaged approximately 260,000 smolts in recent years.

The Warm Springs National Fish Hatchery made its first release (178,890) in 1978.

Returns of hatchery fish to the river from 1985-90 ranged from 50-77 percent of the total run.

A stock-recruitment curve has been developed for wild fish in the Warm Springs River (Figure 1).

Wild spring chinook spawning is confined to Shitike Creek and the Warm Springs River system.

Most Recent Findings

1582 adult spring chinook entered the Pelton Trap in 1991. This count is less than the 1990 cumulative total of 2,083, but slightly above the 5-year average count of 1,527 (Figure 2).

The 1991 return of wild spring chinook to the Pelton Trap and Warm Springs Hatchery was 850 fish, the lowest escapement in fifteen years of record.

A statistical sampling program has monitored harvest on the river since 1971.

Sport and Indian fishing pressure was less in 1991 than 1990. Sport anglers harvested slightly more hatchery adults and a record number of hatchery jacks in 1991. Sport harvest of wild adults was only about half of the 1990 catch (Table 3).

1991 sport harvest totalled 2,078 fish, or 86% of the total estimated harvest (Table 3).

Actions

The Deschutes River Fish Management Plan will be completed this year. This plan includes a run size goal of 8,500-12,000 fish to river, with a spawning escapement goal of 1,400-2,500 wild fish.

A statistical creel program will be used to monitor 1992 sport and tribal harvest at Sherars Falls.

The Oregon State Police have placed a high priority on monitoring sport harvest during the peak of the 1992 fishery.

The Northwest Power Planning Council will decide the fate of the Pelton Ladder Master Plan in April. Approval of this plan would result in increased spring chinook production in the Pelton Ladder and up to 60,000 additional hatchery smolts released into the Deschutes River.

Wild adult spawning escapement goal for the Warm Springs River is 1,000-1,250 escapement above Warm Springs hatchery. More restrictive harvest regulations will be needed if the escapement continues to fall below 1,000 fish.

Warm Springs Hatchery can incorporate up to 10 percent of the wild run into the hatchery brood once the 1,000 fish escapement goal is reached.

Current Assessment

Adult hatchery returns to the Deschutes have improved and now are a major component of the total run. Care must be taken to avoid overharvest of the wild population.

This population is important to sport and tribal interests. It is important that this population be maintained or enhanced.

Table 1. Hatchery and wild spring chinook salmon escapement (Adult plus Jack) above Sherars Falls, 1977-91.

Year	Wild	Pelton Trap Hatchery	Warm Springs Hatchery Wild	Hatchery	Total
1977	20	27	1,606	0	1653
1978	10	14	2,660	0	2684
1979	24	26	1,395	0	1445
1980	18	84	1,002	0	1104
1981+	46	407	1,575	85	2113
1982	25	438	1,454	916	2833
1983	9	614	1,541	371	2535
1984*	21	583	1,290	992	2886
1985	107	1,542	1,155	1,079	3883
1986	44	1,820	1,711	337	3912
1987	157	1,348	1,783	704	3992
1988	55	1,472	1,647	824	3998
1989	50	2,241	1,409	2,538	6238
1990	45	2,211	1,867	1,311	5434
1991	33	1,921	817	644	3415

+ Sport Fishery Closed

* Sport and Indian Fishery Closed

Table 2

Appendix Table C-2. Releases of salmon into Warm Springs basin and Shitike Creek, 1957-72.

Year released, species or race of salmon	Origin	Release site	Number released	Size
1957: Sockeye	Leavenworth	Long Lake	30,000	Fingerling
1958: Coho	Little White Salmon	Warm Springs River	106,600	Eggs
Spring chinook	Carson	Warm Springs River	100,000	Eggs
Fall chinook	Spring Creek	Warm Springs River	300,000	Eggs
1961: Spring chinook	Carson	Warm Springs River	75,313	Subsmolts
1962: Spring chinook	Carson	Quartz Creek	150,000	1,000 fish/lb
1963: Coho	Unknown	Beaver Creek	225,000	Eggs
1964: Coho	Eagle Creek and Oxbow	Beaver Creek	685,400	Eggs
Spring chinook	McKenzie River	Warm Springs River	399,000	Fry
Spring chinook	McKenzie River	Hill Creek	232,000	Fry
Spring chinook	McKenzie River	Beaver Creek	66,000	Fry
1965: Coho	Carson	Warm Springs River	515,000	60 fish/lb
Coho	Carson	Badger Creek	34,425	25 fish/lb
Coho	Carson	Beaver Creek	100,000	--
Spring chinook	Eagle Creek	Warm Springs River	500,044	196 fish/lb
Coho	Unknown	Warm Springs River	34,325	25 fish/lb
1966: Coho	Unknown	Shitike Creek	417	Adults
Spring chinook	Eagle Creek	Warm Springs River	200,000	200 fish/lb
Spring chinook	Eagle Creek	Warm Springs River	500,000	1,700 fish/lb
Coho	Unknown	Beaver Creek	500,000	Eggs
1967: Spring chinook	Eagle Creek	Warm Springs River	211,500	34 fish/lb
Fall chinook	Little White Salmon	Warm Springs River	502,500	1,139 fish/lb
Coho	Unknown	Shitike Creek	450	Adults
1968: Fall chinook	Little White Salmon	Warm Springs River	1,000,000	856 fish/lb
Spring chinook	Round Butte	Warm Springs River	470,340	Eggs
Chinook	Unknown	Shitike Creek	121	Adults
Coho	Unknown	Shitike Creek	717	Adults
1969: Spring chinook	Carson	Warm Springs River	450,017	Eggs
1970: Chinook	Carson	Warm Springs River	24,906	Eggs
Chinook	Round Butte	Beaver Creek	65	Adults
Chinook	Round Butte	Beaver Creek	207	Jacks
Coho	Round Butte	Beaver Creek	1	Adult
Sockeye	Round Butte	Beaver Creek	19	Adults
1971: Chinook	Round Butte	Warm Springs River	155,426	Eggs
1972: Chinook	Round Butte	Warm Springs River	80,000	Eggs

Appendix Table 2. Releases of juvenile spring chinook salmon from Round Butte Hatchery into the Deschutes River 1972-84 broods.^a D = dorsal, LP = left pectoral, RP = right pectoral, Ad = adipose, LV = left ventral, RV = right ventral, An = anal, LM = left maxillary.

Brood year, release date	Release site	Number released	Size at release (fish/lb)	Fin clip or coded-wire tag code
1972:^b				
04/27/73	Pelton ladder	50,122	76.6	D-LP
04/27/73	Lake Simtustus	182,283	63.7	LP
06/05/73	Pelton Reregulating Reservoir	65,678	50.6	LP
03/04-05/74	Pelton Reregulating Dam	145,214	6.7-7.2	Ad-LP
1973:^b				
04/10-16/74	Lake Simtustus	81,110	65.0	LV
04/19/74	Lake Simtustus	65,635	61.0	No mark
04/23/74	Pelton Reregulating Reservoir	81,704	61.1	No mark
04/23/74	Pelton Reregulating Reservoir	86,775	65.0	No mark
04/23/74	Pelton Reregulating Reservoir	1,320	60.0	An
05/10/74	Pelton ladder	23,964	55.0	An
06/03/74	Pelton Reregulating Dam	61,560	26.2	D-RP
06/11/74	Lake Billy Chinook	15,000	75.0	No mark
02/14-18/75	Pelton Reregulating Dam	103,629	5.5	LV-LM
1974:				
06/03/75	Pelton Reregulating Dam	20,150	30.0	D-LP
10/20/75	Pelton Reregulating Dam	4,267	5.6	D-LV
12/19/75	Pelton Reregulating Dam	14,448	13.0	D-LV
1975:				
10/05/76	Pelton Reregulating Reservoir	27,579	9.3	09 04 06
10/05/76	Pelton Reregulating Reservoir	12,051	9.3	09 04 07
1976:				
05/02/77	Pelton Reregulating Dam	62,040	40.0	09 16 01 and 09 16 02
06/03/77	Pelton Reregulating Dam	36,675	25.0	09 16 03
06/03/77	Pelton Reregulating Dam	35,625	25.0	09 16 04
1977:				
05/31/78	Pelton Reregulating Dam	47,802	28.4	07 16 11
05/31/78	Pelton Reregulating Dam	47,598	32.3	07 16 12
05/31/78	Pelton Reregulating Dam	26,394	23.7	07 16 15
10/04/78	Pelton Reregulating Dam	26,640	13.0	07 16 54
10/04/78	Pelton Reregulating Dam	25,908	13.2	07 16 55
04/09/79	Pelton Reregulating Dam	42,000	9.1	07 16 53

^a Experimental releases totaling 70,013 were made into Pelton ladder from 1975 to 1979 (1976-77 broods) to determine migration timing but were not included in this table.

^b Race was not differentiated but most were believed to be spring chinook salmon.

Appendix Table 2 Continued.

Brood year, release date	Release site	Number released	Size at release (fish/lb)	Fin clip or coded-wire tag code
1978:				
05/10/79	Pelton ladder ^c	14,579	19.7	07 18 24
05/30/79	Pelton Reregulating Dam	54,300	22.0	07 18 25
04/14/80	Pelton Reregulating Dam	32,865	8.0	07 19 49
04/14/80	Pelton Reregulating Dam	30,758	8.8	07 19 50
04/14/80	Pelton Reregulating Dam	29,993	8.0	07 19 51
1979:				
05/12/80	Pelton ladder ^c	22,245	20.0	07 21 53
10/06/80	Pelton Reregulating Dam	29,264	5.9	07 21 54
03/10/81	Pelton Reregulating Dam	30,450	7.3	07 23 10
04/24/81	Pelton Reregulating Dam	29,200	4.9	07 23 09
03/02/81	Pelton ladder ^d	25,446	8.8	07 23 11
1980:				
10/05/81	Pelton Reregulating Dam	48,472	5.7	07 23 47
10/05/81	Pelton Reregulating Dam	29,430	11.4	07 23 49
03/02/82	Pelton ladder ^d	28,656	5.9	07 23 48
03/23/82	Pelton Reregulating Dam	25,010	4.8	07 23 50
1981:				
10/11/82	Pelton Reregulating Dam	28,538	6.4	07 25 20
10/11/82	Pelton Reregulating Dam	59,118	23.6	07 27 15
03/21/83	Pelton Reregulating Dam	57,340	9.3	07 27 14
03/02/83	Pelton ladder ^d	48,495	12.2	07 27 16
03/21/83	Pelton ladder ^d	24,847	12.2	07 27 17
1982:				
05/24/83	Pelton Reregulating Dam	28,979	19.2	07 28 36
10/05/83	Pelton Reregulating Dam	53,550	16.3	07 28 43
10/06/83	Pelton Reregulating Dam	28,200	5.6	07 28 37
04/16/84	Pelton Reregulating Dam	28,790	5.2	07 28 39
04/16/84	Pelton Reregulating Dam	28,991	5.2	07 28 40
03/05/84	Pelton ladder ^d	54,000	9.5	07 28 42
04/15/84	Pelton ladder ^d	51,000	8.4	07 28 41
1983:				
10/08/84	Pelton Reregulating Dam	60,797	12.4	07 31 31
10/09/84	Pelton Reregulating Dam	30,394	6.5	07 31 32
04/02/85	Pelton Reregulating Dam	57,749	5.8	07 31 28
03/09/85	Pelton ladder ^d	60,725	7.6	07 31 29
04/01/85	Pelton ladder ^d	60,770	7.6	07 31 30
1984:				
03/12/86	Pelton Reregulating Dam	62,952	5.7	07 33 20
03/11/86	Pelton ladder ^d	65,931	7.7	07 33 21
03/11/86	Pelton ladder ^d	75,349	7.7	LV-LM
03/11/86	Pelton ladder ^d	73,529	7.7	LP

^c Fish were transferred from the hatchery to Pelton ladder in March and allowed to migrate on their own volition beginning on the release date.

^d Fish were transferred from the hatchery to Pelton ladder in late October or early November and allowed to migrate on their own volition beginning on the release date.

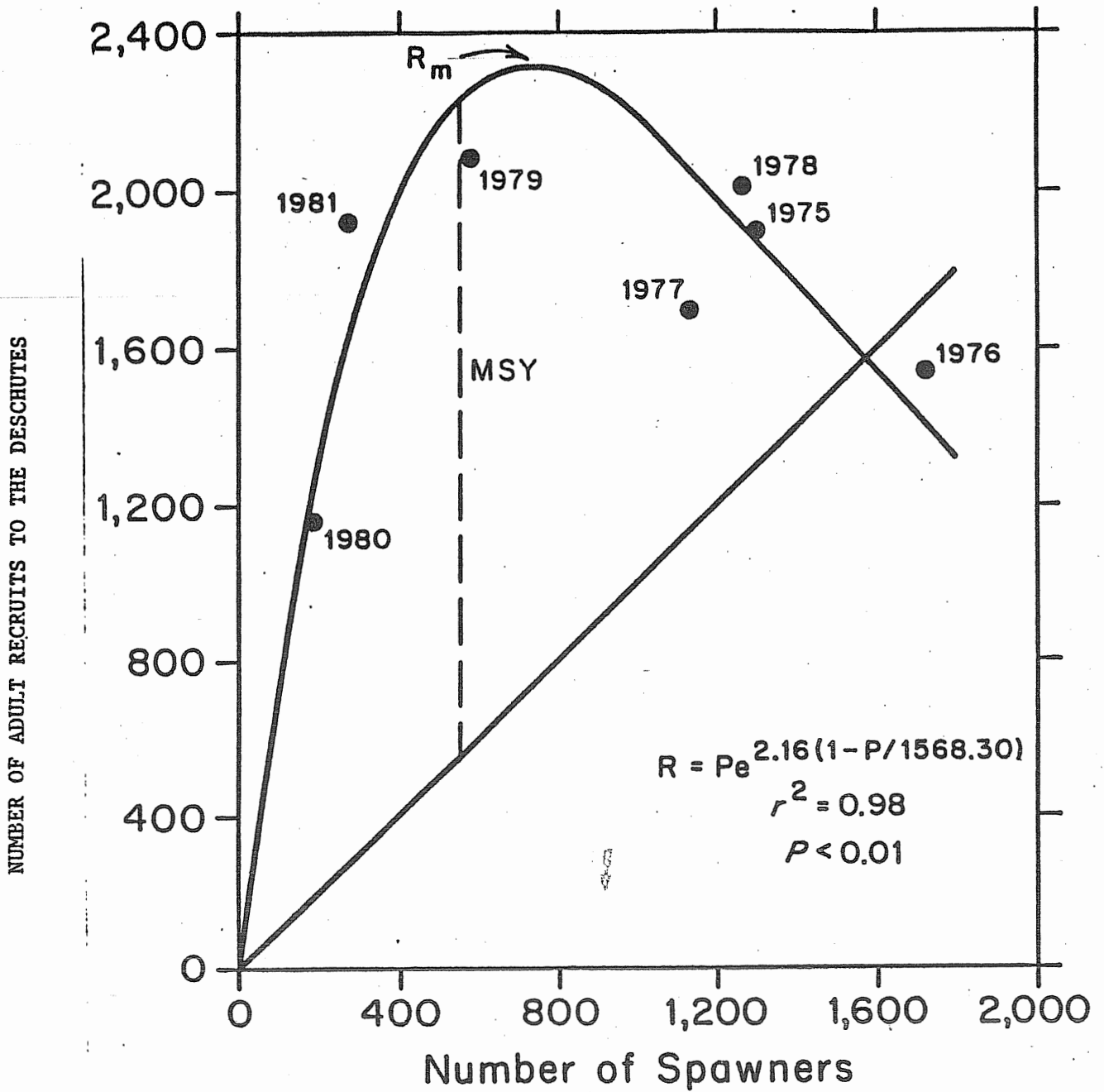
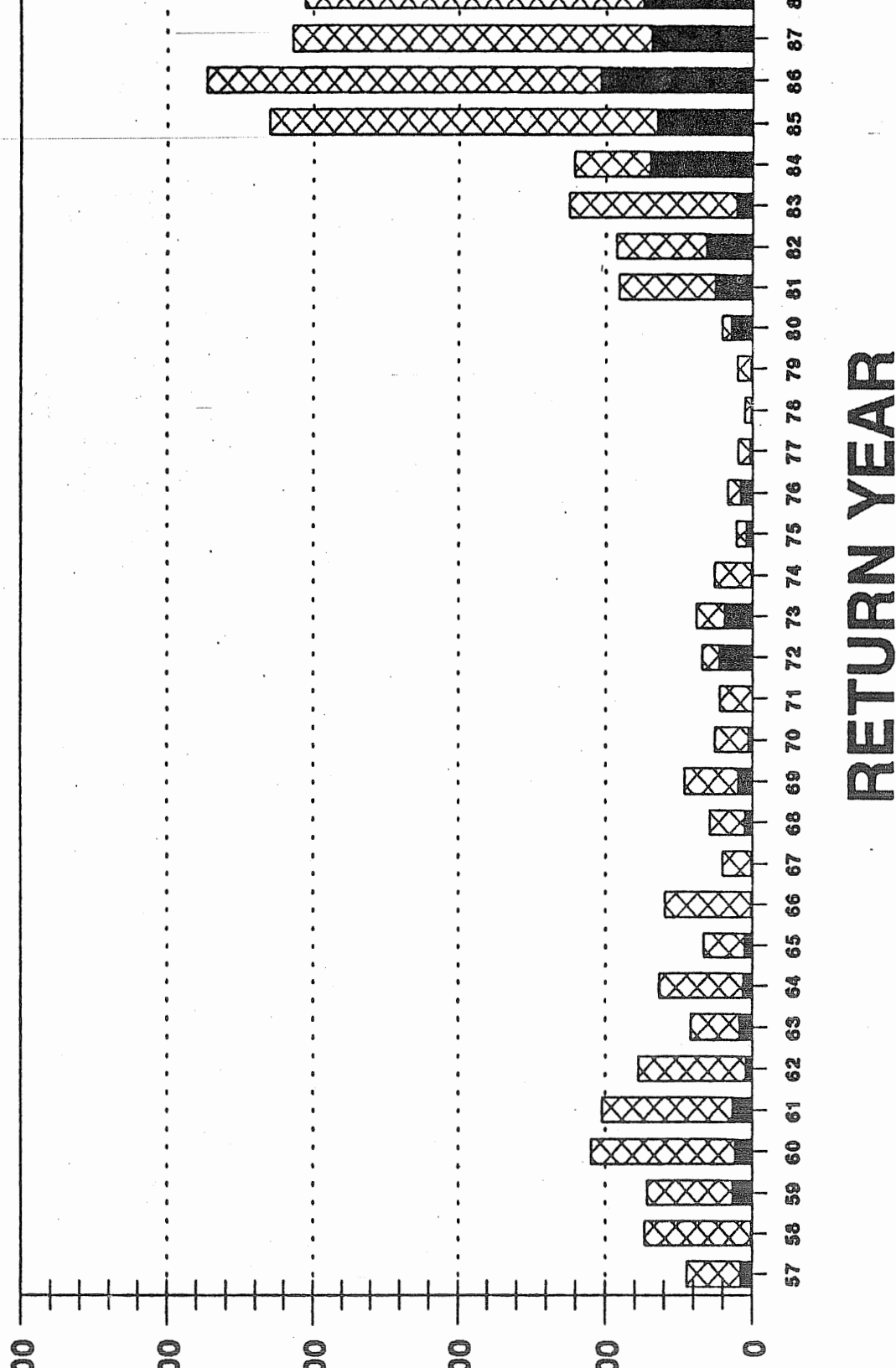


FIGURE 1. Stock-recruitment curve for spring chinook salmon in the Warm Springs River, 1975-81 broods.

Figure 2

SPRING CHINOOK RETURN PELTON TRAP (HATCHERY + WILD + STRAY)

■ Jacks ☒ Adult



RETURN YEAR

Table 3. Expanded creel census on spring chinook (April 15-June 15) at Sherars Falls, Deschutes River, 1980-1991

Year	Angler Nets+	Hours	Sport				Indian			
			Wild Adult	Jack	Hatchery Adult	Jack	Wild Adult	Jack	Hatchery Adult	Jack
1980	2,481	13,845	298	39	8	52				
1980	15	39					0			
1981	--						--			
1981	--						--			
1982	4,093	20,894	445	57	430	106				
1982	32	156					19	0	30	0
1983	3,148	16,487	308	52	246	51				
1983	163	756					11	2	14	6
1984	--						--			
1984	--						--			
1985	4,193	22,321	665	53	720	208				
1985	226	1,862					103	5	120	10
1986*	1,184	7,705	113	9	111	73				
1986*	145	1,327					22	0	27	8
1987	3,790	22,916	468	35	549	210				
1987	441	2,524					397	11	320	52
1988	4,087	19,603	566	63	975	336				
1988	403	2,549					227	13	282	65
1989	3,768	16,456	497	22	1,283	313				
1989	309	1,579					240	25	457	32
1990	6,046	30,861	725	50	1,169	113				
1990	497	2,407					291	6	406	19
1991	5,926	26,453	441	44	1,206	387				
1991	274	1,567					94	12	189	48

+ Includes dipnets, Indian hook and line, and snagging

* 5-16 to 6-15 only

REVIEW OF HATCHERY FISH USE

Mid-Columbia District

Program:

Round Butte Hatchery Summer Steelhead

Waterbody:

Deschutes River (lower 100 miles)

Species:

Steelhead, Summers, Lot 66

Brood Stock:

Brood stock were collected at the Pelton Trap beginning in 1965. Prior to 1957 broodstock was collected in Squaw Creek. Brood stock was collected in the Willamette River in 1958, Big Creek (winter steelhead) in 1959, Skamania in 1965 and Siletz in 1965-66. Prior to 1975 Deschutes summer steelhead were reared at Cedar Creek, Gant Creek, Oak Springs, and Wizard Fall hatcheries. Beginning in 1973 steelhead have been released primarily from Round Butte Hatchery. A few steelhead were reared at Warm Springs Hatchery from 1978 and 1980-84 broods. This production was discontinued after the 1984 brood (Lindsay et al, 1991).

Prior to 1983, wild, Deschutes hatchery, and stray hatchery steelhead were all used as brood stock. Beginning with the 1983 run, only fish known to be of Round Butte Hatchery origin were collected for broodstock to eliminate the possibility of introducing the upper Columbia River strain of IHN (Lindsay et al). However, beginning with the 1988 brood, wild fish were again collected for broodstock. These wild fish are spawned as a separate production group and wild gametes are not incorporated into the hatchery origin production egg takes.

Facilities:

Brood stock is collected at Pelton Trap and transported to adult holding ponds at Round Butte Hatchery. Fish are spawned and incubated at Round Butte Hatchery. Fish are transferred into burrows raceway ponds for rearing to smolt-size. Beginning with the 1989 brood, all steelhead smolts have been released immediately downstream from the Pelton Regulation Dam.

Eggs and Fish Produced:

(700k eggs are taken annually for IHD Cushman)
Sufficient eggs are taken to produce 162,000 smolts averaging 5 fish per pound at release.

Objectives:

The Portland General Electric Company hydroelectric license for the Pelton/Round Butte Complex required the company to finance construction and operation of a hatchery. They were also required to return an annual adult run of 1800 summer steelhead to the Pelton Trap. This hatchery program contributes to an important in-river sport and tribal subsistence fishery. All smolts are

released near the Pelton Trap in an attempt to encourage returning hatchery-origin adults to return to the trap and thus reduce the potential for interaction with spawning wild fish. Steelhead management objectives are to maintain an annual run of 16,000 to 22,000 fish annually to the river with a minimum spawning escapement of 6,575 wild summer steelhead.

Program Description:

Hatchery steelhead were first released into the Deschutes River in 1952 and releases continued through 1957. Except for 1960, no releases were made until 1965 when it was conceded that downstream migrants could not be passed through the Pelton/Round Butte Complex. Hatchery fish have been released annually since 1965 (Lindsay et al). Prior to the 1987 brood, hatchery smolts were released below the Pelton Regulating Dam as well as in the Maupin to Macks Canyon areas (rivermile 24 to 50). Size at release has averaged 4-6- per pound.

Success in Meeting Objectives:

Returns of Round Butte Hatchery origin adult steelhead exceeded the PGE mitigation requirements from 1975-1989, except for 1977. Returns the past two years (i.e. 89-90, 90-91) fell short of the mitigation level (see Figure 1, page H-5). Round Butte steelhead smolts released immediately below the Pelton Reregulating Dam have returned to the Pelton Trap at a mean rate of 1.8% for 1969-86 broods. Survival of individual release groups ranged from 0.2% to 4.3% (Table 1). The total return to the Deschutes River, including sport and tribal harvest in years when all creel areas below Sherars Falls were sampled averaged 4.2% for 1978-80 broods (Table 2) (Lindsay 1991 et al).

Constraints in Meeting Objectives:

IHN is commonly present at the hatchery. It was first detected in steelhead in 1975. Some of the highest steelhead losses at the hatchery followed low carrier rates in parent broodstock. Conversely, high incidences of IHN in the brood have resulted in low or no losses in the offspring. The hatchery consistently takes large numbers of steelhead eggs as a contingency for outbreaks of IHN (Nyara, 1989). (700k - 900k)

All hatchery steelhead released from Round Butte Hatchery receive multiple fin-clips. This external marking likely reduces survival and potential adult returns.

In the past five years (run years 86-87 thru 90-91) the wild/natural spawning escapement above Sherars Falls has averaged 4,417 fish. This escapement is well below the escapement goal of 6,575. The spawning escapement (escapement minus Pelton Trap counts) of Round Butte Hatchery and stray hatchery steelhead during the same period averaged 8,813 (Table 3).

Out-of-basin factors limiting adult returns include: dam mortality, predation, and commercial harvest (ocean and Columbia River).

Biological Feasibility:

This program potentially is in conflict with the wild fish management policy. The Round Butte Hatchery stock has not infused any wild/natural genetic material into the brood since 1983. This stock is probably no longer genetically similar to the wild/natural population, and yet these fish may nearly equal the numbers of wild/natural fish on the spawning grounds. However, the large number of stray hatchery fish spawning in the river combined with the Round Butte Hatchery spawners make compliance with the Wild Fish Management Policy extremely unlikely.

We need to make a conscious effort to include wild/natural adults into the hatchery brood and egg table.

Cost Effectiveness:

This is a very cost effective program for ODFW, since PGE funds all operation and maintenance costs associated with Round Butte Hatchery. The Deschutes summer steelhead provide an estimated 100,000 to 150,000 hours of angling effort annually and approximately 15,000 to 20,000 angler trips. Based on an average angler day of four hours, the value of this fishery is estimated to range from \$770,000 to \$1,155,000 annually (angler day value \$30.80 - ODFW Fish Management Manual, 1977). Steelhead production costs at Round Butte Hatchery average approximately \$110,000 annually.

Overview:

This program should continue, however, there are some changes needed. We should immediately begin incorporating wild/natural fish into the hatchery production. We should investigate the question of variability in hatchery vs wild/natural steelhead biteability. We need to reduce the number of hatchery origin steelhead spawning with the wild/natural run component.

Table 1. Percent return to Pelton trap of Deschutes hatchery summer steelhead released as juveniles immediately below Pelton Reregulating Dam, 1969-80, 1985-87 broods^a. The 1981-84 broods were not included because juveniles released at Pelton Reregulating Dam were not differentially marked from those released below Sherars Falls. Ad = adipose, LV = left ventral, RV = right ventral, LP = left pectoral, RP = right pectoral, LM = left maxillary, RM = right maxillary.

Brood year, fin clip	Number released	Adult return		Percent return
		1-salt	2-salt	
1969:				
Ad-LV	38,416 ^b	238	78	0.8
LV-LM	38,358	595	240	2.2
LV-RM	24,406	143	125	1.1
LP-RM	119,012	1,249	814	1.7
1970:				
LV	34,168 ^b	140	143	0.8
Ad-RV	47,650	216	406	1.3
Ad-RP	117,908	487	832	1.1
Ad-LV-RV	38,810	289	359	1.7
1971:				
RV	42,206	489	407	2.1
Ad-LV	25,465 ^b	478	38	2.0
Ad-LM	118,632	2,352	1,482	3.2
LV-RV	45,109	182	442	1.4
1972:				
Ad-RV	38,857	1,146	364	3.9
Ad-RP	124,438	2,652	975	2.9
1973:				
LV-RP	100,248	325	627	0.9
1974:				
LV	35,176	88	207	0.8
RV	33,910	98	262	1.1
LV-RV	35,404	87	159	0.7
1975:				
LV-RM	26,483	349	468	3.1
RV-LM	27,072	315	175	1.8
RV-RM	27,100	344	358	2.6

^a The 1969-71 broods were reared at Cedar Creek, Gnat Creek, Oak Springs, and Wizard Falls hatcheries; the 1972 brood was reared at Cedar Creek and Wizard Falls hatcheries; and the 1973-87 broods were reared at Round Butte Hatchery. Fish from Warm Springs NFH are not included.

^b Two-year smolts.

Table 1 Continued.

Brood year, fin clip	Number released	Adult return		Percent return
		1-salt	2-salt	
1976: LV-RP	82,906	360	338	0.8
1977: LV	27,195	701	475	4.3
RV	26,565	640	289	3.5
LV-RV	27,627	459	308	2.8
1978: LV-RM	27,207	399	321	2.6
RV-RM	21,334	199	386	2.7
1979: LP	28,056	170	507	2.4
LP-LM	28,744	272	337	2.1
LP-RM	24,759	192	294	2.0
1980: LV	26,813	69	79	0.6
RV	25,403	55	81	0.5
LV-RV	27,516	59	46	0.4
LV-RV-RM	25,263	26	33	0.2
1985: Ad-LP-RM	53,949	222	557	1.4
1986: Ad-LP	50,431	212	223	0.9
1987: Ad-RV-RM	53,402	222	--	--

Table 2. Percent return to the mouth of the Deschutes River of Round Butte Hatchery summer steelhead released as juveniles immediately below Pelton Reregulating Dam, 1978-80 broods. These were the only broods sampled in complete creel surveys when they returned as 1- and 2-salt adults. Fin clip abbreviations are the same as in Table 39.

Brood year, finclip	Number released	Adult return		Percent return
		1-salt	2-salt	
1978:				
LV-RM	27,207	1,092	704	6.6
RV-RM	21,334	502	770	6.0
1979:				
LP	28,056	612	1,125	6.2
LP-LM	28,744	618	750	4.8
LP-RM	24,759	434	599	4.2
1980:				
LV	26,813	153	228	1.4
RV	25,403	143	283	1.7
LV-RV	27,516	121	185	1.1
LV-RV-RM	25,263	57	47	0.4

Table 3

DESCHUTES RIVER SUMMER STEELHEAD
Spawning Escapement
above Sherars Falls

Year	Wild/Natural (escapement)	Wild/Natural (Pelton Trap)	Round Butte Hatchery (escapement)	Round Butte Hatchery (Pelton Trap)	Hatchery Stray (escapement)	Hatchery Stray (Pelton Trap)
1	3,653	82	1,990	634	2,852	400
0	4,278	136	2,758	829	3,659	524
9	3,546	123	3,849	1,254	2,909	296
8	5,367	160	9,209	1,496	8,367	784
7	6,207	467	9,064	2,628	9,803	1,550
6	9,624	686	7,382	3,153	5,056	943
5	7,721	603	7,563	3,278	3,824	795
4	8,228	814	7,250	2,338	7,684	1,553
3	6,567	343	3,524	1,535	---	180

REVIEW OF HATCHERY FISH USE

Mid-Columbia District

Program:

Deschutes River Spring Chinook Mitigation

Waterbody:

Lower Deschutes River

Species:

Chinook, Spring (Lot 66)

Broodstock:

The brood stock is a combination of Metolius and Warm Springs River stocks that have been collected at the Pelton Fish Trap and, on at least two occasions, from the Sherars Falls fish ladder. In recent years returning Round Butte Hatchery origin adults comprise the bulk of the brood, with smaller numbers of wild/natural adults comprising the remainder of the brood.

Facilities Used:

The broodstock is collected at the Pelton Fish Trap, which is located on the Deschutes River immediately downstream from the Pelton Regulation Dam (rivermile 100). The brood are transferred to holding ponds at Round Butte Hatchery. Fish are spawned and incubated at Round Butte Hatchery. Approximately 60,000 smolts are reared to smolt size in hatchery raceways ponds. The additional 210,000 fish are transferred to the old Pelton Fish Ladder in the early fall for semi-natural rearing (i.e. one feeding per day-five days per week) until they are volitionally released the following April as age 1+ smolts. The conventional hatchery reared smolts are trucked to the base of the Regulation Dam as age 1+ smolts for an early April release.

Eggs and Fish Produced:

Approximately 360,000 eggs are taken to ultimately produce 270,000 smolts. These eggs are taken from late August to mid-September.

Objectives:

The primary program objective is to mitigate for lost natural production of spring chinook that occurred upstream of the Pelton/Round Butte Hydroelectric Complex. A specific condition of the PGE hydroelectric license required construction and operation of a fish hatchery, (Round Butte) and the annual return of 1,200 adult spring chinook to the Pelton Fish Trap.

Other program objectives including providing sport and tribal fishing opportunities in the Columbia and Deschutes rivers.

This program is designed to meet mitigation and harvest objectives without negatively impacting the wild spring chinook population. Approximately 95% of the wild population spawns upstream from Warm Springs National Fish Hatchery. The upstream spawning escapement at this facility 1,000 to 1,250 wild fish. Hatchery origin fish are blocked from passing above Warm Springs Hatchery.

Program Description:

About 10 million hatchery spring chinook salmon have been released into the lower Deschutes Basin since 1966. Juveniles released into the mainstem Deschutes River prior to 1972 were reared at Wizard Falls, Oak Springs, and Fall River hatcheries. PGE constructed Round Butte Hatchery, which began operation in 1972.

During the past five years approximately 80% (210,000) of the spring chinook were reared in the Pelton Ladder from November to the following spring. The remaining 20% were reared in the hatchery and released as yearlings to approximately coincide with the volitional ladder releases. All smolts enter the river immediately downstream from the Pelton Regulating Dam. Size at release has varied with the two rearing scenarios. Hatchery-reared fish average 6-7 per pound at release, while the ladder reared fish usually average 8-10 fish per pound (Table 1).

Success in Meeting Objectives:

The return of Round Butte Hatchery origin adults to the Pelton Fish Trap has exceeded mitigation requirements (1,200 adults) since 1985 (Figure 1).

The annual spawning escapement of wild fish at the Warm Springs Hatchery and Pelton Fish Trap have averaged 1,573 fish for the past five years. This is above the wild spawning escapement goal of 1,250 fish. Unfortunately the 1991 wild spawner escapement dropped to 850 fish, the lowest escapement in fifteen years of record. However, the wild escapement from 1986-1990 remained relatively stable at 1,409 to 1,867 fish.

The annual in-river sport and tribal harvest of Round Butte fish has averaged 1,367 fish for the past five years, while the corresponding harvest of hatchery origin jack salmon has averaged 285 fish (Table 3, Page I-7).

The in-river exploitation rate on hatchery and wild spring chinook has averaged 36% and 35% respectively for the past five years (1987-91) (Table 2).

Constraints in Meeting Objectives:

Round Butte Hatchery production (i.e. 270,000 smolts) has consistently returned more hatchery adults than mitigation requires. Round Butte Hatchery fish do not spawn in the mainstem Deschutes River and straying within the basin or into other basins has been extremely rare. The ability to manually sort adults upstream past the Warm Springs Hatchery provides the unique opportunity to protect the genetic integrity of the wild

population. This program exceeds the most restrictive criteria of the Wild Fish Management Policy, while providing for an aggressive hatchery program and significant in-river sport and tribal harvest.

It is essential that all hatchery fish are marked for easy identification as returning adults. It is also essential that harvest and escapement data continue to be collected to monitor the status of the wild population. The potential negative interaction between hatchery juveniles and other resident and anadromous fish populations will probably preclude significant expansion of this program.

Biological Feasibility:

This program exceeds the most restrictive criteria of the Wild Fish Management Policy, since wild and hatchery adults are effectively segregated. Approximately 95% of the wild production occurs in the Warm Springs River system upstream from Warm Springs Fish Hatchery. Hatchery-origin fish, which all carry external marks, are physically blocked from spawning with wild fish in the upper Warm Springs River.

Except, for 1991, the wild spawning escapement has exceeded the escapement goal for the past fifteen years. However to meet the escapement goal the in-river fishery was restricted in 1981 and 1984.

The lower Deschutes Basin is a very productive system. We have not been able to identify any negative impacts of this program on other fish populations. However, realizing the system has production limits, there are no plans to significantly increase this hatchery program.

Cost Effectiveness:

It is estimated to cost approximately \$90,456 annually to produce 270,000 spring chinook smolts (i.e. \$2.71 lb - 1991). The annual in-river harvest of Round Butte Hatchery origin adult salmon has averaged 1,367 fish for the past five years. This harvest has an estimated value of \$168,414 (estimated value of spring chinook \$123.20 - 4 days @ \$30.80/day). Therefore the benefit:cost ratio for in-river harvest, alone, is approximately 1.86:1. However, when considering that approximately 24% of the Deschutes spring chinook harvest occurs out-of-basin (i.e. Ocean and Columbia River) the total estimated harvest value would likely exceed \$200,000, or a benefit:cost ratio of more than 2.21:1 for total fish harvested.

Overview:

This is an excellent program that should continue. The program exceeds the requirements of the Wild Fish Management Policy for protection of wild populations. The program is completely funded, as a mitigation requirement, by Portland General Electric. We must continue to monitor harvest and escapement in order to meet the wild fish spawning escapement goal. If wild fish exploitation rates rise we may have to implement harvest regulations to protect this population.

The opportunity may exist to significantly increase production in the unused segments of the Pelton Fish Ladder, if other recipient waters are identified. The Pelton Ladder Master Plan proposes to increase ladder releases into the Deschutes River to a total of 270,000 fish, or total release of 330,000 smolts. Concerns about the potential impact of hatchery-reared spring chinook juveniles on other resident and anadromous fish populations in the river dictate that we probably should not exceed this level of production without extensive monitoring and evaluation.

Table 1
Deschutes River Spring Chinook Releases
1987-1991

Brood Year	Release Date	Release Site	Number Released	Size at Release	Mark
1989	4/22/91	Reg. Dam	31,410	6.5	Ad-CWT
	4/23/91	Reg. Dam	28,508	5.7	Ad-CWT
	5/14/91	Reg. Dam	146,985	9.8	RM
	5/14/91	Reg. Dam	<u>63,989</u>	9.8	Ad-CWT
			270,892		
1988	4/19/90	Reg. Dam	28,608	6.0	AD-CWT
	4/20/91	Reg. Dam	29,590	6.5	Ad-CWT
	4/23/91	Reg. Dam	66,402	9.7	Ad-CWT
	4/23/91	Reg. Dam	<u>134,847</u>	9.7	LM
			259,447		
1987	4/17/89	Reg. Dam	57,714	6.8	Ad-CWT
	4/17/89	Reg. Dam	61,332	10.6	Ad-CWT
	4/17/89	Reg. Dam	<u>153,868</u>		
			272,914		
1986	4/12/88	Reg. Dam	54,221	6.9	Ad-CWT
	4/22/88	Reg. Dam	61,270	8.3	Ad-CWT
	4/22/88	Reg. Dam	74,365	8.3	LP
	4/22/88	Reg. Dam	<u>74,364</u>	8.3	LVLN
			264,220		
1985	4/13/87	Reg. Dam	59,843	6.1	Ad-CWT
	5/27/87	Reg. Dam	75,000	7.5	RP
	5/27/87	Reg. Dam	62,000	7.5	Ad-CWT
	5/27/87	Reg. Dam	<u>74,000</u>	7.5	RVRM
			270,843		

Fig. 1

SPRING CHINOOK RETURNS TO PELTON TRAP

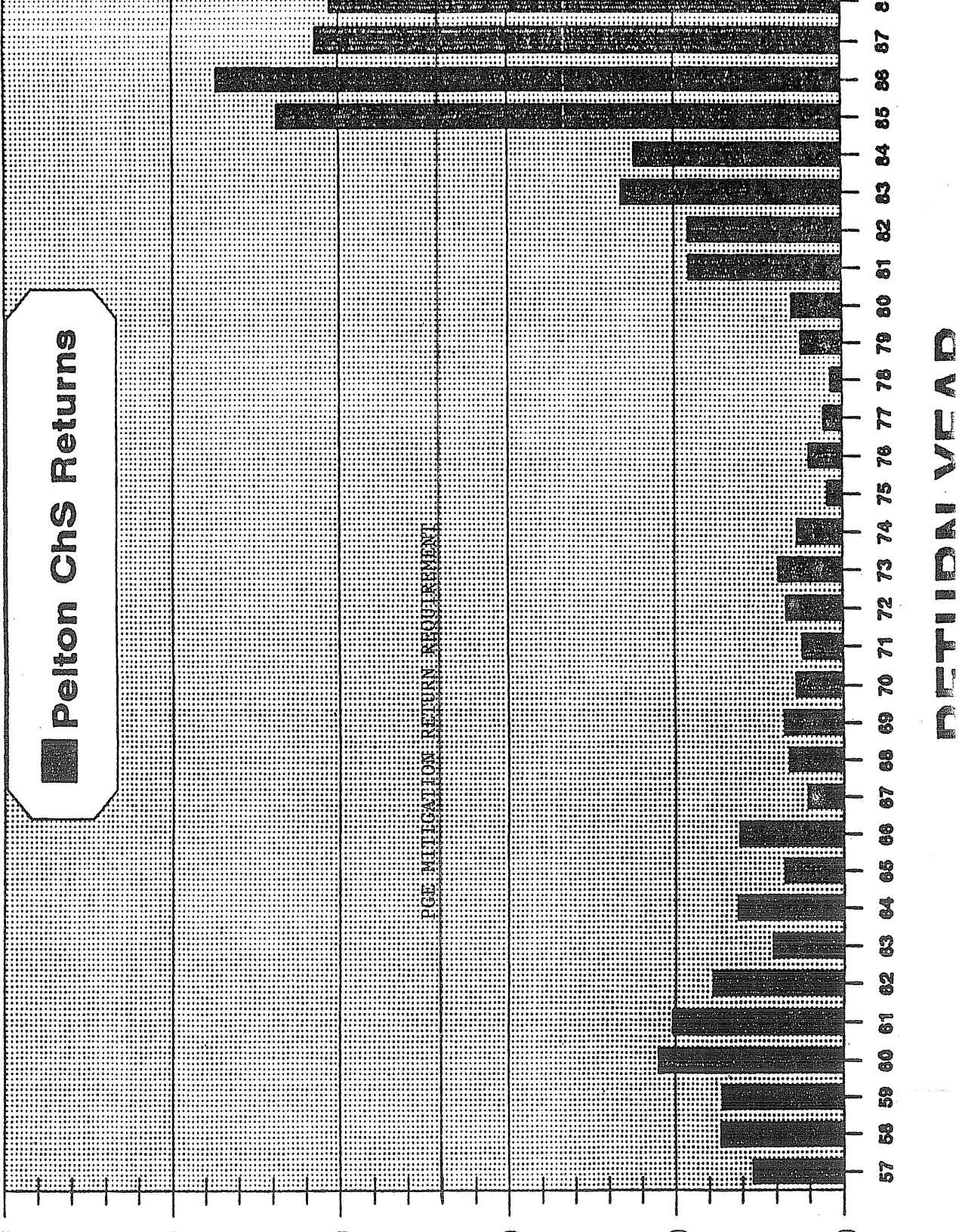


Table 2

DESCHUTES RIVER SPRING CHINOOK SALMON EXPLOITATION, 1987-91

	Wild Spring Chinook			Hatchery Spring Chinook				
	Harvest	Escapement	Population	Exploitation	Harvest	Escapement		Population
7	911	1940	2851	32%	1131	2052	3183	36%
8	869	1702	2571	34%	1658	2296	3954	42%
9	784	1459	2243	35%	2085	4779	6864	30%
0	1072	1912	2984	36%	1707	3522	5229	33%
1	591	850	1441	41%	1830	2565	4395	42%
	4227		12,090	35%	8411		23,625	36%

REVIEW OF HATCHERY FISH USE

Mid-Columbia District

Program:

Hood River Winter Steelhead Supplementation

Waterbody:

Hood River and tributaries

Species:

Steelhead, Winter (Lot 50)

Broodstock:

This brood was collected from wild/natural winter steelhead from Hood River. The first brood, collected in 1991, were caught by volunteer anglers and subsequently held until spawning. In 1992 adult brood was collected at a temporary fish trap installed in the Powerdale Dam fish ladder.

Facilities Used:

Broodstock are collected in a temporary adult migrant trap installed in the Powerdale Dam fish ladder. Fish are transferred to a spring-fed holding pond located on Rogers Spring Creek (donated for our use by the Middle Fork Irrigation District). Fish are spawned at the holding facility. The green eggs are transferred to Irrigon Hatchery for incubation and early rearing. After the fish reach 200 per pound, and have received a disease clearance, they are transferred to Oak Springs Hatchery for rearing until direct release into Hood River.

Eggs and Fish Produced:

This pilot project calls for an egg take of 45,000 eggs to produce 30,000 smolts. Eggs are taken throughout the run (i.e. January - March) and fertilized using the matrix technique. Each female's eggs are split into groups that are each fertilized using a different male, to increase genetic diversity.

Objectives:

This program is intended to restore the wild/natural goal of maintaining an average annual escapement of 5,000 fish to Hood River, while providing 2,600 fish for harvest and a spawning escapement of 2,400 fish. This program is consistent with the Wild Fish Management policy. This fishery will provide Hood River anglers with a diversity of angling opportunities.

Program Description:

This is a pilot program initiated in 1991 with a volunteer (STEP) angler brood collection program. In 1992 brood stock were collected in a fish trap installed in the Powerdale Dam fish ladder. This program supersedes a program that saw Big Creek stock smolts released from 1985-1991.

The 30,000 Hood River smolts will be released into the Middle and East forks of Hood River in April at 4-5 fish per pound. The fish will all be marked with a distinctive external mark to allow easy identification of returning adults.

Constraints in Meeting Objectives:

The wild/natural brood collection at the temporary adult migrant trap is labor intensive. Each adult must have scale samples analyzed to confirm its wild origin. Suitable adult holding facilities are difficult to find and usually not in close proximity to the brood collection site. When using small numbers of brood stock, it is a challenge to have males and females mature in a timely fashion. Hormones have been used occasionally to increase the rate of female maturation. Matrix spawning and the associated paper trail is labor intensive. The shortage of egg incubation isolation facilities requires frequent (weekly) transfer of small lots of green eggs to Irrigon Hatchery. Other production programs at Irrigon Hatchery dictate that the Hood River StW egg take be completed by mid-March. The availability of only one raceway pond at Oak Springs Hatchery limits production to 30,000 smolts.

The numbers of wild/natural fish available for brood is unpredictable. Beginning in 1992 Hood River anglers are now required to release all wild steelhead. However, the Zone 6 winter commercial gillnet season overlaps the period when these fish are passing through the Bonneville Pool. Data collected from December 15, 1991 - April 1, 1992 indicates that 35-40 percent of the fish carry scars attributed to marine mammal encounters. Therefore a high incidence of predation could also limit the population size and number of potential brood.

For twenty years the only population data available for Hood River has been harvest estimates generated from the voluntary return of angler salmon and steelhead tags. These data seem to indicate a decline in the population, but there is no other corroborative data.

Biological Feasibility:

The potential to restore the depressed population of wild/natural Hood River winter steelhead is significantly enhanced with the use of a Hood River wild/natural brood. The ability to control spawning escapement upstream from Powerdale Dam also provides the opportunity to supplement the wild/natural population and provide in-river fishing opportunities, while also meeting the spawning criteria of the Wild Fish Management Policy. All upstream migrants must pass through the Powerdale Dam fish ladder to reach the majority of spawning habitat in the basin.

Data is not available to accurately estimate the smolt production capacity for this basin. However, based on a subjective evaluation of the habitat along with several assumptions about the spacial distribution of the population, it is estimated that natural smolt production is approximately 31,000 fish. If this production estimate is accurate, hatchery supplementation will have to continue annually to meet population objectives.

Hood River production is limited by the low biomass potential of the short, high gradient, mountain-fed streams. Seasonal glacial turbidity further limits biological potential in the East and Middle forks, as well as the mainstem Hood River. An unscreened 135 cfs irrigation diversion on the East Fork undoubtedly impacts steelhead survival.

Cost Effectiveness:

This program has yet to return adult steelhead to Hood River. However, the program may show a negative benefit:cost ration in the initial years because of the labor and transportation costs associated with the pilot project (i.e. trap operation, adult transportation, adult holding, monitoring adults, spawning, transportation of eggs and fry, and voluminous record keeping).

Overview:

This project provides the best opportunity to restore this depressed wild/natural population in a manner consistent with the Wild Fish Management Policy, while continuing to provide in-river fishing opportunities. The Confederated Warm Springs Tribes and ODFW have submitted the Hood River Master Plan to the Northwest Power Planning Council for their consideration and potential approval in April, 1992. Approval of this plan could result in Bonneville Power Administration funding of a permanent adult migrant trap, sorting and holding facilities, and juvenile acclimation ponds adjacent to Powerdale Dam. This proposal provides the best opportunity to collect accurate population data and expand this pilot supplementation program for wild/natural winter steelhead. Implementation of the Hood River Master Plan could also provide construction and O & M dollars for additional raceway ponds at Oak Springs Hatchery to accommodate increased smolt production and the eventual release of up to 85,000 Hood River smolts annually into the basin.

Funding and implementation of the Hood River Master Plan could also include important monitoring and evaluation programs to assess a list of critical uncertainties, including: monitoring harvest and escapement (run-size); monitoring smolt production; determination of spacial and temporal distribution of resident and anadromous fish; and assessment of the effects of the production project on natural production of anadromous species and resident fish populations.

REVIEW OF HATCHERY FISH USE

Mid-Columbia District

Program:

South Santiam (Skamania) Summer Steelhead

Waterbody:

Hood River

Species:

Steelhead, Summer (Lot 24)

Broodstock:

Hatchery summer steelhead smolts (Hood River, Washougal, and Skamania stocks) have been released into the Hood River drainage annually since 1958. The number released has ranged from 1,800 to 185,510 smolts. The use of Hood River broodstock was discontinued in 1965. Skamania stock summer steelhead have been released annually since 1975. Eyed Skamania eggs are shipped from South Santiam Hatchery to Oak Springs Hatchery for rearing to the smolt stage.

Facilities Used:

Adult steelhead are collected at the Foster Dam fish trap and transferred to holding facilities at South Santiam Hatchery. Fish are spawned and eggs incubated to the eyed stage. Eyed eggs are shipped to Oak Springs for final incubation and rearing. Annual release of 75,000-100,000 smolts have been made in the mainstem and West Fork Hood River.

Eggs and Fish Produced:

Oak Springs Hatchery needs approximately 115,000 eyed eggs to produce 100,000 smolts for the Hood River release.

Objectives:

The management objective is to achieve and maintain an average annual escapement of approximately 8,000 summer steelhead to Hood River, and an annual spawner escapement of 1,200 wild/natural fish, and up to 1,200 genetically similar hatchery fish. The current hatchery program was designed to provide a diversity of angling opportunities for summer steelhead. It has been estimated that the Hood River Basin natural smolt production capacity is approximately 32,000 smolts. This estimate was based on a subjective evaluation of the habitat along with several assumptions about the spacial distribution of the population. If this production assumption is correct it is readily apparent that hatchery supplementation must continue if population objectives are to be reached.

Program Description:

The current hatchery program began in 1975. The annual release of 80,000 to 100,000 smolts has been split between sites on the Mainstem and West Fork Hood River. The smolts have consistently averaged 4-5 per pound when released in early to mid-April (Table 1). The fish have all been adipose-clipped.

Success in Meeting Objectives:

Unfortunately the only recent information available on summer steelhead in the Hood River Basin has been sport harvest estimates generated from voluntary angler returns of the salmon steelhead tags (Table 2). These data do not distinguish the origin of fish harvested. These data would appear to indicate that the population size has been fairly stable for the past six years.

Constraints in Meeting Objectives:

It is impossible to determine whether existing management strategies are meeting management objectives, since there is a lack of data for this population. Salmon/steelhead tag generated harvest estimates comprise all of the available data on this population for the past twenty years.

Biological Feasibility:

This program is probably inconsistent with the Wild Fish Management Policy because of the use of the genetically dissimilar stock. However, this conclusion is strictly speculative, since no accurate population or spawning escapement data exists since 1971.

It is probably safe to assume that Skamania stock returning to the South Santiam River are genetically inferior to wild Hood River summer steelhead. However, it does appear that this stock has provided adult returns to Hood River. These returns of Skamania stock likely have interbred with wild Hood River summer steelhead.

Cost Effectiveness:

Hatchery rearing and transportation costs for production of 80,000 to 100,000 smolts for release into Hood River at 4 per pound averages \$60,000 to \$75,000 (@\$3.00/lb). The Hood River summer steelhead fishery provides an annual sport harvest of approximately 3,575 with a value of approximately \$220,220 for in-river harvest (estimated value of each fish \$61.60 - 2 days/fish @ \$30.80/day). This does not include the value of sport and commercially landed fish in the Columbia River.

Overview:

This program has been effective at providing a terminal sport fishery. However, continuation of the program would likely be in direct conflict with the Wild Fish Management Policy. The draft Hood River Fish Management Plan proposes to develop a Hood River brood from wild/natural Hood River stock. The district and the Warm Springs Confederated Tribes have requested the Northwest Power Planning Council approval and Bonneville Power Administration funding for a permanent adult fish trap, sorting, and holding facilities at Powerdale Dam (rivermile 4.0). These facilities, as proposed, would provide a valuable tool to monitor the population as well as collect wild/natural brood. Proposed acclimation ponds would potentially increase the rate of adult returns while minimizing potential straying. The Powerdale fish trap could be used as a valuable tool in meeting the spawning criteria of the Wild Fish Management Policy, since all the tributaries and virtually all spawning occurs upstream from Powerdale Dam.

Table 1. Brood release of summer steelhead smolts into the Hood River Basin, 1980-1986 Broods.

Brood Year	Hatchery	Brood stock	Mark	Date	Size (fish/lb)	Number	Release site
1980	Oak Springs	Skamania	--	4/ 7/81	5.0	6,250	Hood River
	Oak Springs	Skamania	--	4/ 7/81	5.1	5,508	Hood River
	Oak Springs	Skamania	--	4/ 7/81	5.7	13,462	Hood River
	Oak Springs	Skamania	--	5/ 1/81	4.3	10,369	Hood River
	Oak Springs	Skamania	--	4/ 9/81	5.6	6,440	Lake Branch Creek
	Oak Springs	Skamania	--	4/ 9/81	6.0	6,000	Lake Branch Creek
	Oak Springs	Skamania	--	4/ 8/81	5.0	13,248	Hood River, W. Fk.
	Oak Springs	Skamania	--	4/ 8/81	5.6	14,540	Hood River, W. Fk.
	Oak Springs	Skamania	--	4/ 9/81	5.0	12,800	Hood River, W. Fk.
	Oak Springs	Skamania	--	4/10/81	4.7	10,927	Hood River, W. Fk.
1981	Oak Springs	Skamania	--	4/ 5/82	4.3	13,650	Hood River
	Oak Springs	Skamania	--	4/ 7/82	4.3	10,019	Hood River
	Oak Springs	Skamania	--	4/ 9/82	5.6	13,720	Hood River
	Oak Springs	Skamania	--	4/ 8/82	5.6	13,300	Lake Branch Creek
	Oak Springs	Skamania	--	4/ 6/82	4.3	14,566	Hood River, W. Fk.
	Oak Springs	Skamania	--	4/ 7/82	4.3	10,105	Hood River, W. Fk.
	Oak Springs	Skamania	--	4/12/82	5.6	14,270	Hood River, W. Fk.
1982	Oak Springs	Skamania	--	4/ 6/83	5.1	11,730	Hood River
	Oak Springs	Skamania	--	4/ 7/83	5.1	35,589	Hood River
	Oak Springs	Skamania	--	4/12/83	5.0	19,075	Hood River
	Oak Springs	Skamania	--	4/13/83	4.9	6,566	Hood River
	Oak Springs	Skamania	--	4/ 8/83	5.0	11,975	Lake Branch Creek
	Oak Springs	Skamania	--	4/ 9/83	5.0	12,440	Lake Branch Creek
	Oak Springs	Skamania	--	4/ 7/83	5.0	12,125	Hood River, W. Fk.
	Oak Springs	Skamania	--	4/10/83	5.0	51,515	Hood River, W. Fk.
1982	Oak Springs	Skamania	--	4/11/83	4.5	11,475	Hood River, W. Fk.
	Oak Springs	Skamania	--	4/11/83	5.0	6,900	Hood River, W. Fk.
	Oak Springs	Skamania	--	4/11/83	5.1	6,120	Hood River, W. Fk.
1983	Oak Springs	Skamania	AD	4/ 5/84	4.0	9,960	Hood River
	Oak Springs	Skamania	AD	4/ 6/84	4.0	4,600	Hood River
	Oak Springs	Skamania	AD	4/ 9/84	3.9	9,516	Hood River
	Oak Springs	Skamania	AD	4/ 9/84	5.5	6,325	Hood River
	Oak Springs	Skamania	AD	4/10/84	3.9	4,485	Hood River
	Oak Springs	Skamania	AD	4/13/84	4.9	12,985	Hood River
	Oak Springs	Skamania	AD	4/11/84	3.9	9,653	Lake Branch Creek
	Oak Springs	Skamania	AD	4/ 4/84	4.0	4,400	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/ 4/84	4.5	5,400	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/13/84	3.8	5,320	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/13/84	5.0	6,125	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/16/84	4.5	4,725	Hood River, W. Fk.

(continued)

Table 1. Continued

Brood Year	Hatchery	Brood stock	Mark	Date	Size (fish/lb)	Number	Release site
1984	Oak Springs	Skamania	AD	4/ 9/85	4.2	10,920	Hood River
	Oak Springs	Skamania	AD	4/ 9/85	5.5	7,095	Hood River
	Oak Springs	Skamania	AD	4/10/85	4.3	16,542	Hood River
	Oak Springs	Skamania	AD	4/11/85	4.3	4,300	Hood River
	Oak Springs	Skamania	AD	4/16/85	4.0	10,100	Hood River
	Oak Springs	Skamania	AD	4/16/85	4.1	5,433	Hood River
	Oak Springs	Skamania	AD	4/ 4/85	4.5	10,710	Lake Branch Creek
	Oak Springs	Skamania	--	9/10/84	55.0	57,750	Hood River, W. Fk.
	Oak Springs	Skamania	--	9/11/84	50.0	56,250	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/ 3/85	4.7	11,506	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/ 5/85	4.4	4,743	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/11/85	4.5	5,963	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/12/85	4.5	5,850	Hood River, W. Fk.
1985	Oak Springs	Skamania	AD	4/ 7/86	4.1	4,920	Hood River
	Oak Springs	Skamania	AD	4/ 8/86	4.1	4,100	Hood River
	Oak Springs	Skamania	AD	4/ 9/86	4.1	9,656	Hood River
	Oak Springs	Skamania	AD	4/10/86	4.5	21,173	Hood River
	Oak Springs	Skamania	AD	4/11/86	4.5	9,900	Hood River
	Oak Springs	Skamania	AD	4/ 7/86	4.1	9,143	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/ 8/86	4.1	14,494	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/ 9/86	4.1	9,430	Hood River, W. Fk.
1986	Oak Springs	Skamania	AD	4/ 7/87	4.0	4,700	Hood River
	Oak Springs	Skamania	AD	4/ 8/87	4.5	5,738	Hood River
	Oak Springs	Skamania	AD	4/ 9/87	4.8	11,424	Hood River
	Oak Springs	Skamania	AD	4/10/87	4.7	5,358	Hood River
	Oak Springs	Skamania	AD	4/10/87	4.8	5,760	Hood River
	Oak Springs	Skamania	AD	4/ 6/87	4.0	4,900	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/ 7/87	4.0	9,900	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/ 8/87	4.6	5,635	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/ 9/87	4.2	10,206	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/10/87	4.4	5,170	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/10/87	5.2	6,422	Hood River, W. Fk.
	Oak Springs	Skamania	AD	4/13/87	4.4	4,840	Hood River, W. Fk.

Table 2. Sport harvest of natural and hatchery summer steelhead in the Hood River drainage. Estimates are from punch-card returns (adjusted for non-response bias).

Run Year	Sport Catch
1977-78	1,770
1978-79	3,064
1979-80	1,105
1980-81	2,499
1981-82	2,854
1982-83	2,749
1983-84	2,406
1984-85	3,626
1985-86	3,745
1986-87	3,307
1987-88	3,135
1988-89	4,455
1989-90	3,226

REVIEW OF HATCHERY FISH USE

Mid-Columbia District

Program:

Hood River Spring Chinook Re-introduction

Waterbody:

Hood River Basin

Species:

Chinook, Spring (Lot 66)

Broodstock:

The brood stock are collected at the Pelton Fish Trap at the base to the Pelton Regulation Dam (Deschutes River, rivermile 100). These fish are predominately returning hatchery origin adults with a few wild/natural adults included in the production egg take.

Facilities:

Broodstock are transferred from the Pelton Trap to holding facilities at Round Butte Hatchery. Fish are spawned at Round Butte Hatchery. Green eggs are transferred to Bonneville Hatchery for incubation and rearing. Fish are marked with an Ad-CWT prior to smolting. Fish are released into the West Fork Hood River in early April at approximately 8-10 per pound.

Egg and Fish Produced:

The program plans call for an egg take of 178,000 eggs to produce 150,000 smolts. These eggs are taken during late August or early September production Round Butte egg take and are surplus to the 360,000 eggs needed at Round Butte Hatchery.

Objectives:

This program is designed to re-establish a natural reproducing spring chinook population in the Hood River Basin, while also providing Columbia River sport and commercial harvest opportunities and Hood River harvest opportunities. The ultimate goal is to attain an average annual return of 1,700 adult spring chinook to Hood River, with a spawning escapement (natural and hatchery brood) of 600 fish, and 1,100 fish available for in-river harvest.

This fishery would help to provide a diversity of Hood River angling opportunities, while striving to replace an extirpated population.

Program Description:

This program was initiated with the 1991 brood and will replace a program that has seen the release of up to 200,000 Carson stock fry or smolts from 1984-1991. The Deschutes smolts will all be released into the upper West Fork of Hood River in early April at 8-10 per pound. The fish will be 100% marked Ad-CWT.

Success in Meeting Objectives:

The first release of Deschutes stock spring chinook into the Hood River Basin is scheduled to occur April 1, 1992. Therefore we are several years away from being able to evaluate the success of the program.

Constraints in Meeting Objectives:

Brood stock availability at the Pelton Trap is unpredictable, but is expected to be adequate. The draft Hood River Fish Management Plan calls for release of up to 250,000 Deschutes stock smolts and collection of brood from adults returning to Hood River. There are presently no facilities for collection of brood in Hood River or adequate hatchery space to meet smolt production goals. We lack adequate funding to monitor harvest and adult escapement, as well as natural smolt production.

Biological Feasibility:

This program is not inconsistent with the Wild Fish Management Policy, since the indigenous Hood River spring chinook population became extinct by 1970. It is unknown how successful this stock will be at adapting to the Hood River Basin and at what level they might be able to reproduce naturally. Naturally produced spring chinook juveniles may interact with resident trout and juvenile steelhead, but only extensive monitoring and evaluation could like assess the result of this interaction.

Cost Effectiveness:

It is impossible to evaluate the benefits and costs of this program, since we are only beginning implementation. Approximately half the proposed smolt production can be reared at Bonneville Hatchery in the place of Carson stock, which was formerly released into the Hood River Basin. Therefore production costs are assumed to be comparable.

The Warm Springs Confederated Tribes and ODFW has submitted the Pelton Ladder Master Plan to the Northwest Power Planning Council. Council approval of this plan and subsequent funding by the Bonneville Power Administration could result in production of an additional 120,000 smolts in the Pelton Fish Ladder. These fish, combined with the Bonneville Hatchery production, would satisfy the projected smolt production goal. The Pelton Ladder fish would theoretically be produced with considerably less expense than conventional hatchery reared fish.

Potentially survival of these fish should be higher than comparable Deschutes River releases, since the Hood River fish only have one mainstem Columbia dam to negotiate. Ultimately the benefit:cost evaluation will depend upon the collection of good Hood River escapement and harvest estimates.

Overview:

This program provides the best opportunity to re-establish a naturally reproducing spring chinook population in the Hood River Basin. A favorable Northwest Power Planning Council decision on the Hood River and Pelton Ladder Master plans in April 1992 could assure funding for facility construction, operation, and maintenance, and monitoring and evaluation needed to insure the success of this re-introduction program. We should move ahead with this program. This fishery would contribute to sport and tribal fisheries in the Columbia and Hood rivers. Returns from Carson stock releases have generated considerable interest and an estimated harvest of 984 fish in 1990.

REVIEW OF HATCHERY FISH USE

Mid-Columbia District

Program:

WEST SLOPE CUTTHROAT - fingerling lake stocking

Water Body:

Monon Lake (Olallie Lake Basin, Mt. Hood Forest)

Species:

Cutthroat Trout, West Slope, (Lot 72)

Brood Stock:

Twin Lakes, Washington

Facilities Used:

Washington Department operation and facilities for egg take and early incubation. Transfer to Marion Forks Hatchery, with final rearing at Wizard Falls Hatchery prior to liberation.

Eggs and Fish Produced:

Unreliable and unpredictable

Program Description:

This program was initiated in 1984 with annual truck release of approximately 5,000 fingerling in October at approximately 250 per pound. This has evolved into an aerial stocking program in July of 1991 with approximately 7,000 fish at 160 per pound.

Program Objectives:

The objective is to provide a better fishery (i.e. increased angler effort and catch) than was provided by the historic brook trout fishery. Brook trout stocking was discontinued after the 1983 release.

Success in Meeting Objectives:

Based on annual population inventory (Figure 1) it is apparent that this stock performs best a larger release size (i.e. 30/lb). This program has produced fish up to 15 inches. Unfortunately there has been no creel data collected on this fishery because of it's remote location and district manpower limitations. This lake was selected because of it's close proximity to the popular Olallie Lake area, but little apparent angling effort. The lake has no surface outlet and only limited seasonal surface inflow.

Constraints in Meeting Objectives:

The lack of opportunity for angler harvest inventory makes program evaluation difficult. Unpredictable source of eggs make the program difficult to plan or predict. The location of the lake makes regular monitoring difficult (i.e. 2+ hours drive-one way).

Biological Feasibility:

This program is not inconsistent with the Wild Fish Management Policy, since this lake historically lacked any fish population. The lake or it's intermittent tributaries provide no natural production opportunities.

Cost-Effectiveness:

There is little cost involved in this program. West Slope Cutthroat have a reputation of being easily caught by the angler. Theoretically this program may provide more angling opportunity and satisfaction than the former brook trout program.

Overview:

This program should continue if we can be assured of a reliable egg source. This fishery can provide a good alternative to brook trout stocking. Success of the program may also depend on stocking with a good quality and not one that has been held back for months in freezing water.

FIGURE 1

MONON LAKE/TWIN LAKE CUTTHROAT STOCK
GILL NET INVENTORY, 1984-91

CM	YEAR						
	1984	1985	1986	1987	1988	1989	1990 1991
40		N				1	
39		O					
38							
37		I					
36		N					
35		V		1 (AD)	1 (AD)		1
34		E					
33		N	1 (AD)	1 (AD)			1 (AD)
32		T					
31		O	2 (AD)				
30		R			1	1	1 (AD)
29		Y				0	1 (AD)
28				1	2	1	1 (AD)
27			1 (AD)	2	4	2	2 (AD)
26				3	5	5	4 (AD)
25			1 (AD)		2	1	2 5 (AD)
24				2	6	4	2 4 (AD)
23				5	3	3	5 2 (AD)
22				1	3	1	9 5 (AD)
21			1	1			4 (1AD) 1 (AD)
0			1		2		2 (AD)
9						1	5 (AD) 10 (AD)
18	1 (AD)		1	4			14 (13AD)
17	6 (AD)		3	9			13 (AD)
16	5 (AD)		4	8			5 (AD)
15				1			
14							

AD marks stocked in 1983, 1990

X k Immatures	1.18	0.97	1.13	1.11	0.91	1.00
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REVIEW OF HATCHERY FISH USE

Mid-Columbia District

Program:

Catchable Trout - Stream Stocking

Waterbody:

White River

Species:

Rainbow Trout, Cape Cod (Lot 72)

Brood Stock History:

This brood originated in Massachusetts, was transferred to Washington in 1947, and finally moved to Roaring River Hatchery in 1967.

Facilities Used:

Fingerling are transferred to Oak Springs Hatchery from Klamath Hatchery in August at 100 per pound. The fish are reared at Oak Springs until their release as catchables.

Eggs and Fish Produced:

Oak Springs Hatchery receives 210,000 fingerling (100/lb) to produce 180,000 legal-sized trout.

Objectives:

This program is designed to provide a good angling experience, for anglers in two high use areas, on a glacial stream with low biological potential. Natural production in White River is limited by seasonal water turbidity and heavy bedload movement associated with normal glacial melt. This program provides angling diversity in a geographic area with unusually restrictive trout angling regulations (i.e. Deschutes River).

Program Description:

Legal-sized hatchery rainbow trout have been released into White River since at least 1952. The use of the Cape Cod stock began in 1991, because of concerns about fishing dropping out of White River and potentially interbreeding with wild Deschutes rainbow trout. Cape Cod stock are susceptible to Ceratomyxa shasta and would likely die before attempting to spawn in the Deschutes River. C. shasta is prevalent in the Deschutes River, but is not present in White River.

White River is stocked from April to July with a total of 7,000 fish released at Tygh Valley (rivermile 5-6) and Farmers Road crossing (rivermile 17). Annual releases are completed before summer stream flows become too low and before the onset of glacial turbidity. Fish are commonly 3-4 per pound when released.

Success in Meeting Objectives:

District work priorities, budget and personnel limitations, have precluded any comprehensive survey of angler use or harvest. Cursory surveys have shown high angler use in the localized reaches receiving hatchery fish.

Constraints in Meeting Objectives:

The lack of specific management objectives (i.e. hours/fish, fish/angler, angler days, etc) and detailed user and harvest data make program evaluation impossible. Angler access to the river is limited or restricted in some areas by topography and land ownership. Unscreened irrigation diversions may reduce fish survival and availability to the angler.

Biological Feasibility:

This program may be inconsistent with the Wild Fish Management Policy. However, there is little data available to quantify potential carryover of hatchery trout that may attempt to spawn with the wild population. Hatchery trout probably compete for limited feed with wild trout and may act to reduce the wild population. Hatchery trout moving downstream to the Deschutes River likely succumb to C.shasta before attempting to spawn with wild Deschutes River rainbow.

Electrophoretic sampling indicates that there has apparently been little inbreeding between wild and hatchery trout, even after forty years of trout stocking.

Cost Effectiveness:

Production and transportation costs for these 7,000 trout is estimated at \$4,400. However it is impossible to calculate the potential benefit:cost ratio for the program since there is no comprehensive user and/or harvest data.

Overview:

Continuation of this program is questionable, considering potential conflict with the WFMP, and the lack of benefit:cost data. This program does provide a diversity of stream angling opportunities. It appears that competition may be the biggest potential impact on the wild trout.

This program should be monitored and evaluated to determine potential impacts on the wild population before any expansion of the program is considered. Angler use and harvest data should be collected to determine program cost effectiveness.

REVIEW OF HATCHERY FISH USE

Mid-Columbia District

Programs:

Reservoir - Put and take rainbow legals

Waterbody:

Clear Lake (Mt Hood National Forest)

Species:

Rainbow trout, Cape Cod (Lot 72)

Broodstock:

Brood originated in Massachusetts, was transfer to Washington in 1941 and to Roaring River Hatchery in 1967.

Facilities Used:

Fingerling are transferred to Oak Springs Hatchery from Klamath Hatchery in August at 100 per pound. The fish are reared at Oak Springs until their release as catchables.

Eggs and Fish Produced:

Hatchery personnel receive 210,000 fingerling (100/lb) to produce 180,000 legal rainbow for spring/early summer release as catchable-sized trout.

Program Description:

This reservoir has been stocked annually with rainbow trout since 1954. Approximately 16,000 catchable-sized rainbow are stocked in this reservoir annually (May - 10,000, June - 6,000) to provide an acceptable trout fishery for a high use area through the summer months. This 500 acre reservoir, which is located near the crest of the Cascades, supports limited brook trout reproduction in spring areas and the short intermittent tributaries. There is no indication that successful trout reproduction occurs in or upstream from the reservoir.

Success in Meeting Objectives:

Work priorities, budget and personnel limitations have precluded angler creel sampling for the past six years. Random creel data collected in 1985 indicated that 233 anglers sampled caught 268 fish for an average of 1.2 fish/angler. The catch included 100 rainbow and 168 brook trout.

Constraints of Meeting Objectives:

The lack of use and harvest data makes an objective analysis of this program impossible. The drastic annual reservoir fluctuation, associated with seasonal irrigation withdrawals, significantly limits natural reservoir productivity. Elevated water temperatures during mid-late summer restrict fish releases to late spring and early summer. The unscreened water outlet probably results in the

downstream loss of a portion of the population during the annual irrigation withdrawal. The lack of any minimum pool further compounds the productivity and fish survival problems.

Biological Feasibility:

This program is not inconsistent with the Wild Fish Management Policy. The only known natural trout production is occurring in the brook trout population, and this is an introduced or exotic, fish population. The reservoir site was formerly a wet meadow divided by small mountain streams. If the area had an indigenous rainbow trout population, it likely has been lost to years of hatchery trout releases. The hatchery rainbow program probably results in some competition with the brook trout population, however, it would be difficult to quantify the effects of the competition.

This reservoir would probably be the most productive lake in the district if it was not subject to annual pool fluctuations of 20-30 feet.

Cost Effectiveness:

The costs associated with rearing and transportation of 16,000 catchable rainbow is estimated to be \$10,000. Unfortunately the angler use and harvest data is unavailable. Therefore it is impossible to assess the benefit:cost ratio for this program.

Overview:

This program is not inconsistent with the Wild Fish Management Policy. The Reservoir is located within fifty miles of the Portland Metropolitan area, with easy access from Highway 26. The existing program has provided important angling opportunities, and it has developed a regular angler cliental. This program should be continued.

There is a void of angler use and harvest data. A statistical sampling program could be developed to gather the data needed to analyze the benefit:cost ratio for this program. Acquisition of a reservoir minimum pool and/or better water management by the Juniper Flat Irrigation District could provide substantial fishery benefits.