HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Walla Walla River Spring Chinook Reintroduction
Species or Hatchery Stock:	Carson Stock Spring Chinook Salmon
Agency/Operator:	Confederated Tribes of the Umatilla Indian Reservation/United States Fish and Wildlife Service
Watershed and Region:	Walla Walla River, Columbia Basin
Date Submitted:	03/06/2005
Date Last Updated:	05/26/2005

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Walla Walla River Spring Chinook Reintroduction

1.2) Species and population (or stock) under propagation, and ESA status.

Carson stock Spring Chinook Salmon (*Oncorhynchus tshawytscha*) – not listed.

1.3) Responsible organization and individuals

Name (and title): Gary James, Fisheries Program Manager
Agency or Tribe: Confederated Tribes of the Umatilla Indian Reservation
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Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

Name (and title): William Thorson, Hatchery Manager
Agency or Tribe: U.S. Fish and Wildlife Service
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1.4) Funding source, staffing level, and annual hatchery program operational costs.

Carson National Fish Hatchery (NFH) is funded under the Mitchell Act program. It has 7 full time staff and an annual funding level of $574,800. The total station production capacity is 1,420,000 spring Chinook smolts. The Walla Walla program comprises 250,000 of the total program. In addition, there are two in-basin projects funded by the Bonneville Power Administration (BPA) which conduct monitoring and evaluation activities associated with this program. The Walla Walla Basin Natural Production Monitoring and Evaluation (WWBNPME) project has a budget of $520,798 and the Walla Walla Fish Passage Operations (WWFPO) project has a budget of $117,124.

1.5) Location(s) of hatchery and associated facilities.

Carson National Fish Hatchery (NFH) is located at river mile (rm) 18.0 of the Wind River, Skamania County, Washington within the Columbia River basin. However, brook trout (*Salvelins fontinalis*) have been observed this past year in the spring Chinook production ponds at Carson NFH. Because of this concern, it is planned that the fish for this program will actually come from Little White Salmon NFH in 2005 and 2006 while the screening issues are being corrected at Carson NFH. The release location for the Walla Walla program component is at rm 7.8 of the South Fork Walla Walla River in the Walla Walla Subbasin.

1.6) Type of program.

Integrated Recovery

1.7) Purpose (Goal) of program.

The purpose of the Walla Walla program is to help mitigate for fish losses in the Columbia River Basin caused by mainstem hydropower project construction and operation and other basin development by restoring spring Chinook salmon to the Walla Walla Subbasin. It is anticipated that adults from the program will provide escapement for natural production and reestablishment of spring Chinook populations to the Walla Walla Subbasin, establish an in-basin broodstock source, and contribute to treaty and non-treaty fisheries.

The Carson NFH spring Chinook salmon program was initiated in 1955. Carson NFH operates as part of the Columbia River Fisheries Development Program under *US v. Oregon* and is funded through the Mitchell Act - a program to provide for the conservation of Columbia River fishery resources. The Walla Walla reintroduction program is one component of the overall Mitchell Act spring Chinook program conducted at Carson NFH.

1.8) Justification for the program.

This specific reprogramming action was agreed upon as part of the *US v. Oregon* Interim Management Agreement in December 2004 under the Columbia River Fish Management Plan. Carson NFH was authorized by Special Act 50 Stat. 220, May 28, 1937, and placed into operation December 1937 to mitigate for the effects of federal water projects, primarily, Bonneville Dam. The hatchery was reauthorized by the Mitchell Act (16 USC 755-757; 52 Stat. 345) May 11, 1938 and amended on August 8, 1946 (60 Stat. 932) for conservation of fishery resources in the Columbia River Basin.

1.9) List of program "Performance Standards".

See Section 1.10 – For Standards and Indicators specific to Carson NFH fish propagation activities refer to the Carson NFH HGMP.

1.10) List of program "Performance Indicators"

	Benefits	
Performance Standard	**Performance Indicator**	**Monitoring and Evaluation**
Program contributes to mitigation for construction of dams as defined in the Mitchell Act of 1937.	Program provides adults for natural spawning and mainstem treaty and non-treaty harvest.	Monitor tributary adult returns and contribution to mainstem fisheries.
Program meets Columbia River Fish Management Plan (U.S. v Oregon) rebuilding objectives.	Release 250,000 spring Chinook smolts into the Walla Walla River.	Review fish transport summaries to insure release numbers fall within IHOT guidelines of + or – 10% of stated goal. Adults returns to the Walla Walla River will be enumerated and smolt to adult survival rates will be calculated for each brood year released.
Program meets Columbia River Fish Management Plan (U.S. v Oregon) harvest objectives.	Program provides adults for both tributary and mainstem treaty and non-treaty harvest.	Contribution to all mainstem and Walla Walla tributary fisheries will be determined for each brood year released.

Develop a Walla Walla Basin Carson stock broodstock.	Collect enough broodstock in-basin to fulfill program production requirements.	Guidelines still under development – run timing, run and brood composition will be monitored to ensure that broodstock collection guidelines are being followed.
Program is self sufficient utilizing in-basin broodstock.	Enough eggs are provided to Carson NFH to maintain 250,000 smolt program from Walla Walla River broodstock.	Broodstock holding and survival data and spawning data including fecundity and viability will be monitored.
Release groups are sufficiently marked in order to assess contribution to rebuilding and fisheries goals.	All fish are adipose fin clipped and 50,000 are implanted with coded wire tags.	Adults collected for broodstock, harvested, and spawn carcasses are checked for coded-wire tags to determine survival rates back to the Walla Walla River. The PSMFC data base is accessed to determine recoveries from out of basin harvest and terminal locations.
Increase ecological diversity in the Walla Walla Basin.	Reestablishment of naturally spawning spring Chinook in the basin	Monitor spawning escapement , redds, and juvenile production.
Communicate and coordinate effectively with co-managers in the Columbia River basin.	Participate in US v Oregon production advisory committee (PAC) meetings..	Provide technical information for PAC reports.
Develop outreach program to enhance public understanding, participation, and support of Walla Walla River spring Chinook reintroduction effort.	Continue coordination and cooperation efforts with Walla Walla Basin public and private interest groups to build and maintain support for spring Chinook reintroduction in the basin.	None

	Risks	
Performance Standard	**Performance Indicator**	**Monitoring and Evaluation**
Minimize impacts to ESA listed and other native species from broodstock collection activities.	Trapping and handling mortality of STS and bull trout.	Trap and recovery tank mortalities will be enumerated.
Minimize impacts to ESA listed and other native species from disease transmission.	Program will acquire transport permits from co-managers and will be in compliance with IHOT fish health transfer guidelines.	A pathologist from the Lower Columbia River Fish Health Center will examine the fish at least once per month and just prior to transfer. Fish health results will be made available to co-managers for decision on transfer.
Minimize impacts to ESA listed and other native species from juvenile hatchery releases.	Age 1+ yearling smolts will be released.	Smolts traps will monitor outmigration timing and survival.
Minimize impacts to ESA listed and other native species from program adults straying.	Number of program adults captured in other basins.	Coded wire tag recoveries of program adults from the entire Columbia Basin are accessed through the PSMFC data base and summarized.
Minimize impacts to ESA listed and other native species from program related harvest activities.	Number or percent of non-target fish taken in treaty and non-treaty mainstem and tributary fisheries.	Mainstem harvest is monitored by state and tribal agencies to meet biological opinion on fisheries. Similarly, tributary fisheries will also be monitored once implemented.

1.11) Expected size of program.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).

The Carson NFH goal is to retain 1,400 adults for brood with 1,000 adults spawned to produce the total program of 1,420,000 smolts. The Walla Walla component of 250,000 smolts comprises 17.6% of the total program and would require 246 adults be retained and 176 spawned. If broodstock are collected in-basin, 173 adults would need to be collected to produce 250,000 smolts based on Umatilla program performance.

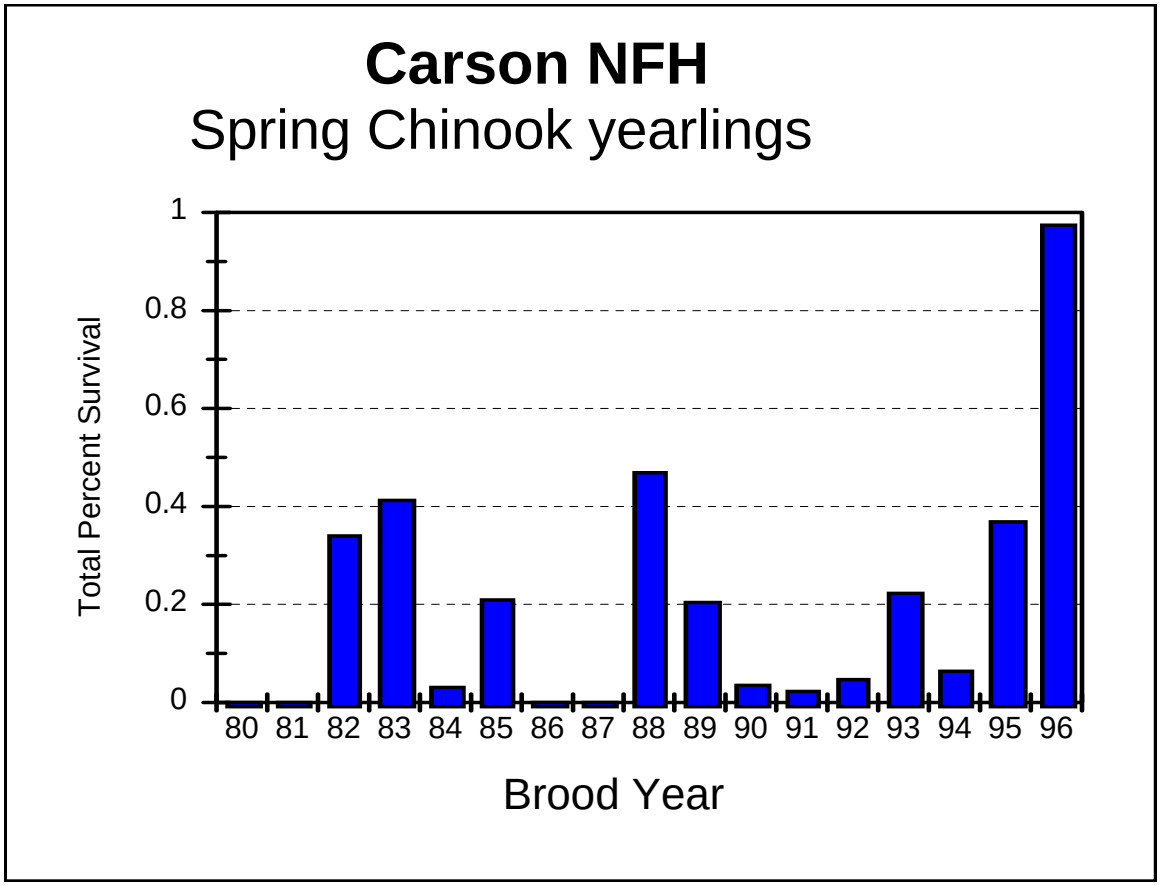
1.11.2) Proposed annual fish release levels (maximum number) by life stage and location.

Life Stage	Release Location	Annual Release Level
Yearling	South Fork Walla Walla River (rm 7.8)	250,000

1.12) Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.

The 2003BY releases in 2005 will be the first year for this component of the program. As stated in Section 1.5, the fish will come from Little White Salmon NFH in 2005 and 2006 due to screening/brook trout concerns at Carson NFH. Figure 1.12 provides historical survival data. Historical escapement numbers for the on-station Carson NFH program can be found in the Carson NFH HGMP.

Figure 1.12. Smolt to adult survival of Carson NFH spring Chinook salmon, brood years 1980-1996 (CRiS, 2002 Carson CHMP).



1.13) Date program started (years in operation), or is expected to start.

2005 will be the first year for the Walla Walla reintroduction smolt release program.

1.14) Expected duration of program.

The US v. Oregon Interim Management Agreement has identified this program as continuing through at least BY2007 (2009 releases). It is anticipated that the program will continue long term either through the Mitchell Act program or with construction of an in-basin spring Chinook hatchery through the NPCC Hatchery Master Planning process.

1.15) Watersheds targeted by program.

Target watershed is the Walla Walla Subbasin within the Columbia River Basin.

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

Two other action alternatives to address the spring Chinook restoration goals in the Walla Walla Subbasin have either been implemented or are under consideration. The first action alternative is an adult outplanting program which was initiated in 2000. Adult spring Chinook from Ringold Springs Hatchery and the Umatilla River have been outplanted into the South Fork Walla Walla River and Mill Creek. These fish have successfully spawned and produced the first returning adults in 2004. Lack of a consistent source of adults for outplanting and lack of available numbers limit the program in its ability to meet the three identified long term production goals for the Walla Walla Subbasin (natural production, broodstock, and harvest). A smolt production program has been identified as the most efficient manner in which to meet the Subbasin goals on an annual basis.

The second action alternative under development is to initiate an in-basin program by constructing a hatchery on the South Fork Walla Walla River through the NPCC Hatchery Master Planning process. A final draft Master Plan has been submitted to BPA and the proposal is proceeding through the NPCC Three-step Master Planning Process. It is anticipated that if the Master Plan is approved and the hatchery is constructed that the Carson NFH Walla Walla program fish would again be released on-station at Carson NFH.

SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS. (Non-Salmonid Species are addressed in Section 15)

2.1) List all ESA permits or authorizations in hand for the hatchery program.

On-station activities at Carson NFH are conducted under the 1999 Biological Opinion on Hatcheries (NOAA, Fisheries) and the Carson NFH HGMP submitted to NOAA Fisheries in May 2004. The purpose of this HGMP is to fulfill the NOAA Fisheries ESA obligation for the Walla Walla release program.

2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.

2.2.1) Description of ESA-listed salmonid population(s) affected by the program.

Walla Walla River summer steelhead (Mid Columbia River ESU).

- **Identify the ESA-listed population(s) that will be directly affected by the program.**

The program will not directly affect any ESA-listed fish population.

- **Identify the ESA-listed population(s) that may be <u>incidentally</u> affected by the program.**

The Walla Walla River native summer steelhead population is depressed and listed as Threatened under ESA. This stock is part of the Mid-Columbia River steelhead Evolutionarily Significant Unit (ESU). There are two distinct components of the Walla Walla population identified by the Interior Columbia Technical Recovery Team (TRT); Touchet River and Walla Walla River (which comprises the remainder of the Subbasin excluding the Touchet River system). Primary ecological interaction for the program will be with the Walla Walla River population with only limited interaction with the Touchet population during smolt outmigration through the lower river.

Age Class Structure and Size Ranges
Natural origin steelhead adults captured at Nursery Bridge Ladder during 1993-1995 were aged by Oregon Department of Fish and Wildlife (Walla Walla Subbasin Plan 2004). Sixty one percent of adult steelhead returning to the Walla Walla River had reared two winters in fresh water and two winters in the ocean (denoted 2.2; Table 1). The next largest age class had spent two winters in fresh water and one winter in the Ocean (20%, 2.1). ODFW also estimated that almost seven percent of adults appeared to be repeat spawners. In contrast, only 32% of Touchet River steelhead adults were age 2.2 with 45% age 2.1 (Table 2). Other life-history strategies were fairly rare in both basins. The Walla Walla and Touchet River population units appear to have unique life-history types based on the information presented in Tables 1 and 2.

Table 1. Percent of sample by age designation for summer steelhead adults collected at Nursery Bridge Dam on the Walla Walla River (Oregon Department of Fish and Wildlife data).

Return	**Life-History Pattern Designation (Percent of Sample)**						
Year	**2.1**	**2.2**	**2.3**	**2.4**	**3.1**	**3.2**	**Repeat**
1992-93	24%	63%	2.6%	0.0%	3%	8%	8.0%
1993-94	21%	56%	0.1%	2.0%	7%	14%	3.5%
1994-95	14%	64%	3.0%	0.0%	9%	11%	9.1%
Mean	20%	61%	5.7%	0.7%	6%	11%	6.8%

Table 2. Ages of adult summer steelhead collected from the Touchet River trap near Dayton Washington, n=507 (WDFW data published in the Walla Walla Subbasin Plan 2004).

Life-History Pattern Designation								
1.1	**1.2**	**2.1**	**2.2**	**3.1**	**3.2**	**4.1**	**4.2**	**Repeat**
1.7%	5.3%	44.9%	32%	6.2%	5%	0.2%	0.2%	3.9%

Lengths of 225 radio tagged adult steelhead ranged from 50 to 90 cm and averaged 65 cm (Table 3 and Figure 1; Mahoney 2003, Schwartz et al. draft 2005). Natural origin adult steelhead in the Walla Walla River were significantly larger than hatchery steelhead which are non-native Lyons Ferry Hatchery stock (*P* (|T|>=t is 0.0042)).

Table 3. Average fork lengths of adult steelhead captured in the Walla Walla River by CTUIR 2002-2005 (Mahoney 2003, Schwartz et al. draft 2005)

	Average Length	Standard Deviation	Range (cm)	n
All Steelhead	64.6	7.809	50-90	225
Hatchery Steelhead	62.7	6.885	50-87	82
Female Hatchery Steelhead	62.5	7.391	50-83	44
Male Hatchery Steelhead	62.9	6.339	55-87	38
Natural Steelhead	65.6	8.121	50-90	143
Female Natural Steelhead	65.7	7.392	55-90	74
Male Natural Steelhead	65.5	8.891	50-87	69

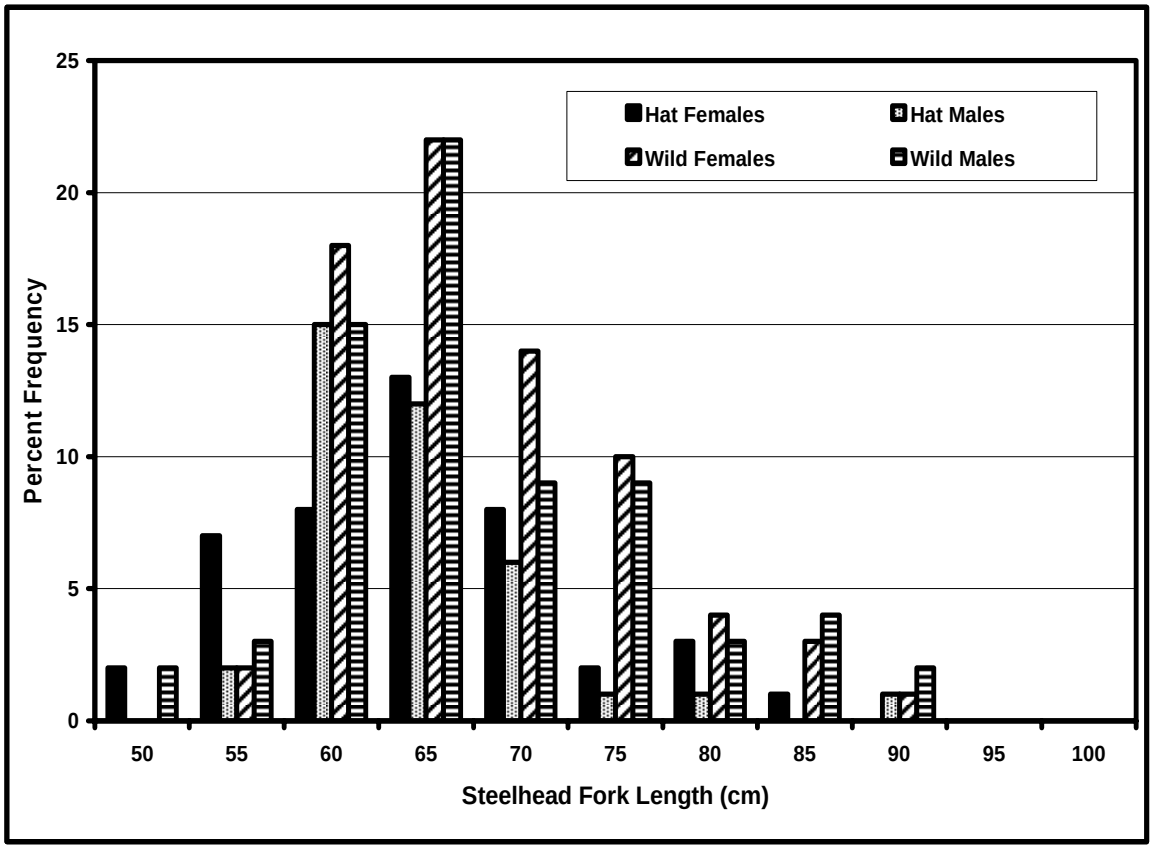


Figure 1. Length frequency histogram of hatchery and natural origin adult steelhead captured by CTUIR in the Walla Walla River, 2002-2005 (Mahoney 2003, Schwartz et al. draft 2005).

Summer steelhead juveniles have considerable overlap in fork length by age (Figure 2 and 3). Tribal biologists aged 780 *O. mykiss* but found only 10 age 4+ (150 to 330 mm) and one age 5+ at 240 mm in length (Contor et al. 2003). The variable growth of *O. mykiss* is likely related to the variety of water temperature profiles and habitat types in the basin. The small size of the older individuals is in part because larger, faster growing *O. mykiss* are thought to migrate to the ocean after their second winter. The early out-migration of the larger individuals leaves the slower growing older individuals (possibly resident fish) for collection. Growth of *O. mykiss* in the Walla Walla basin is significantly slower in the headwater areas (age 2+ $P(t>= 7.484)<0.0001$, age 1+ $P(t>= 9.085)<0.0001$, Figures 4 and 5), where water

temperatures are much colder and the oligotrophic nature of the streams limit energy pathways to fish (Contor et al. 2003).

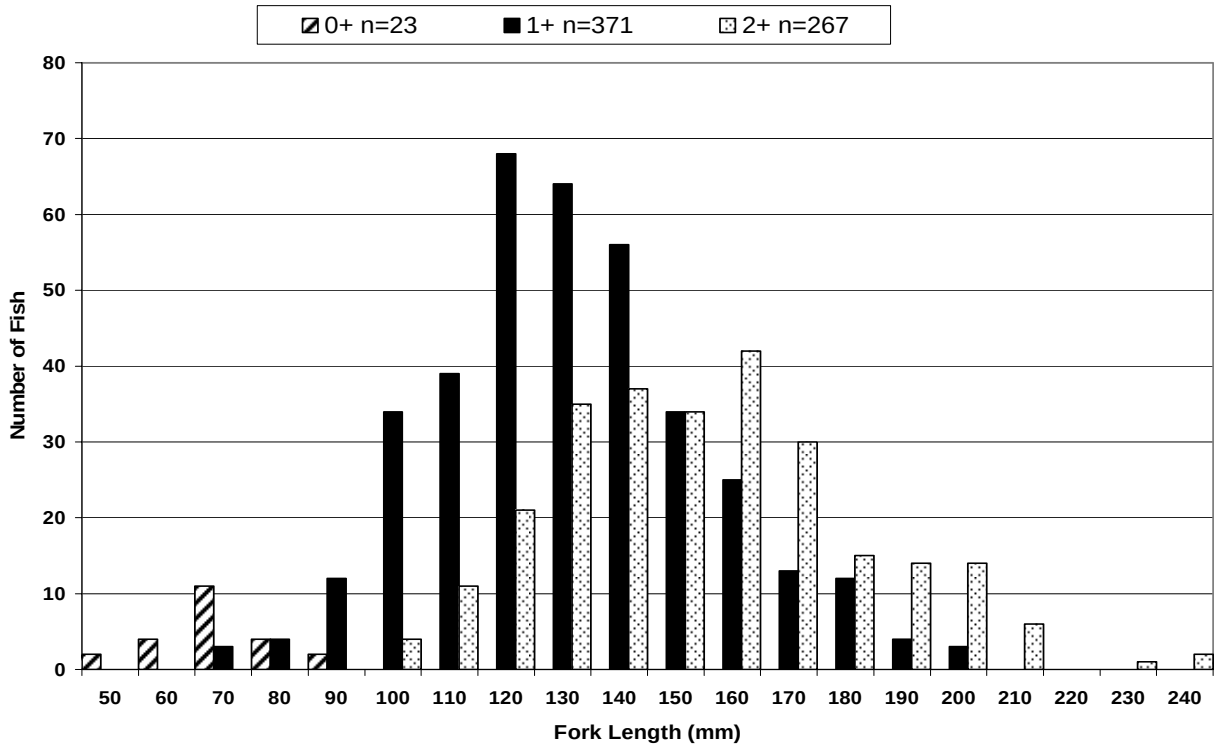


Figure 2. Age and length histogram for *O. mykiss* in the Walla Walla River Basin, ages 0+, 1+ and 2+ (from Contor et al. 2003).

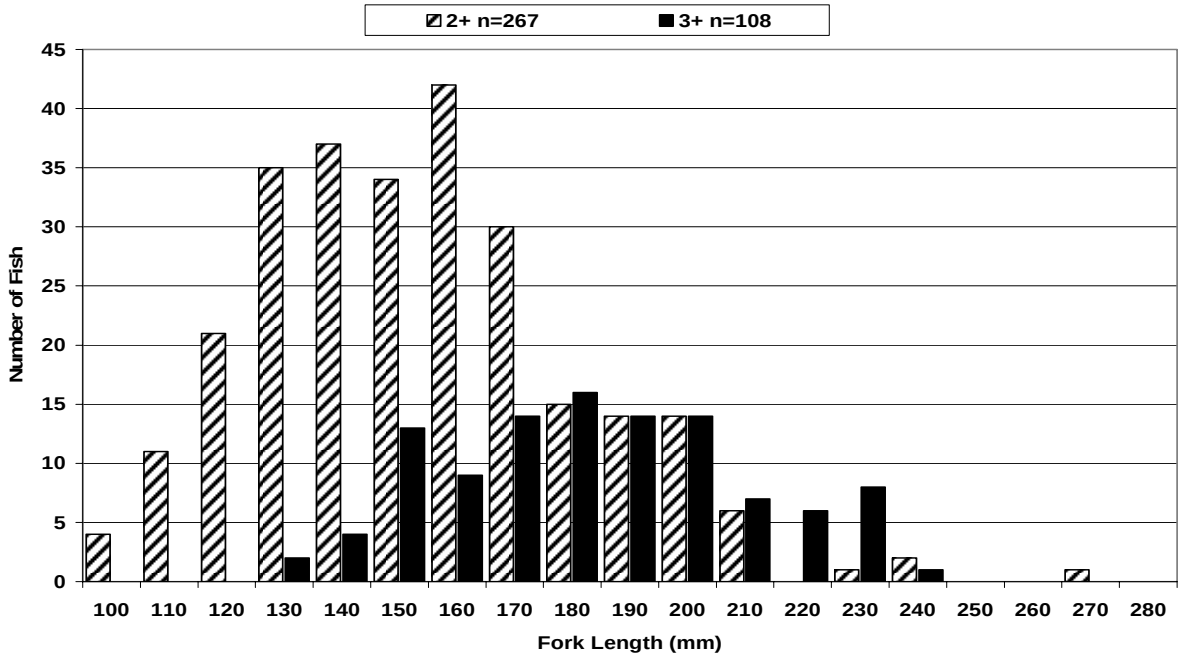


Figure 3. Age and length histogram for .*O mykiss* in the Walla Walla River Basin, age 3+; length frequencies of age 2+ fish are included for comparison (from Contor et al. 2003).

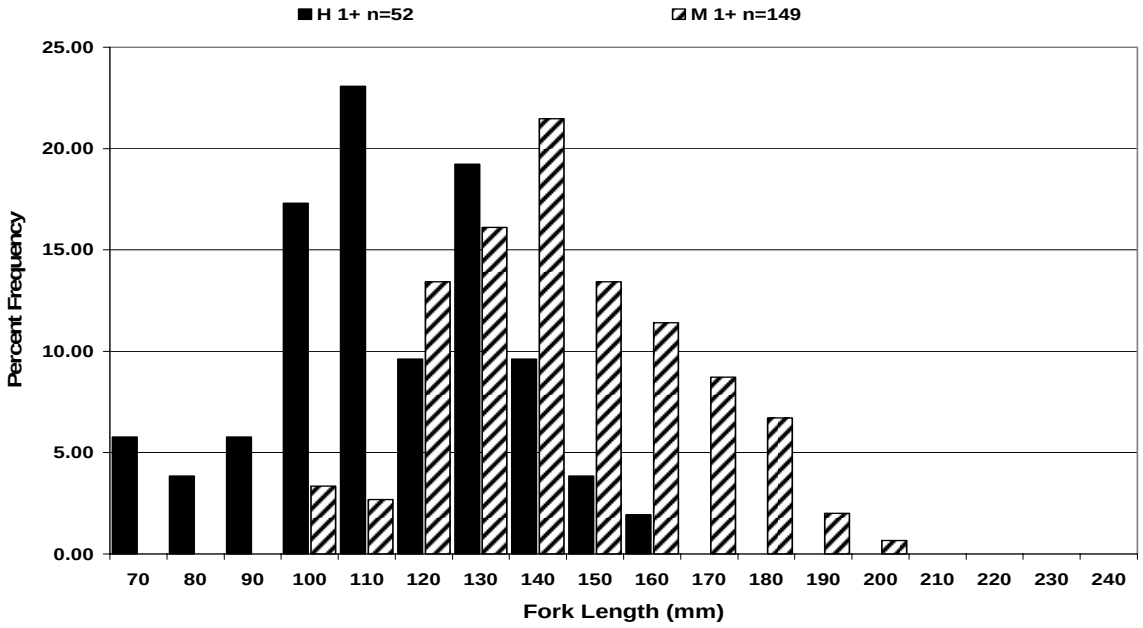


Figure 4 Length frequency histogram for age 1+ *O. mykiss* from two different areas of the Walla Walla River Basin. H 1+ fish are from four headwater reaches, N. F. Walla Walla, N. F. Touchet, Griffin Fork of the S.F. Touchet and West Pattit Creek. M 1+ fish are from mid-basin reaches of Mill Creek and the mainstem Walla Walla River near Milton-Freewater (from Contor et al. 2003).

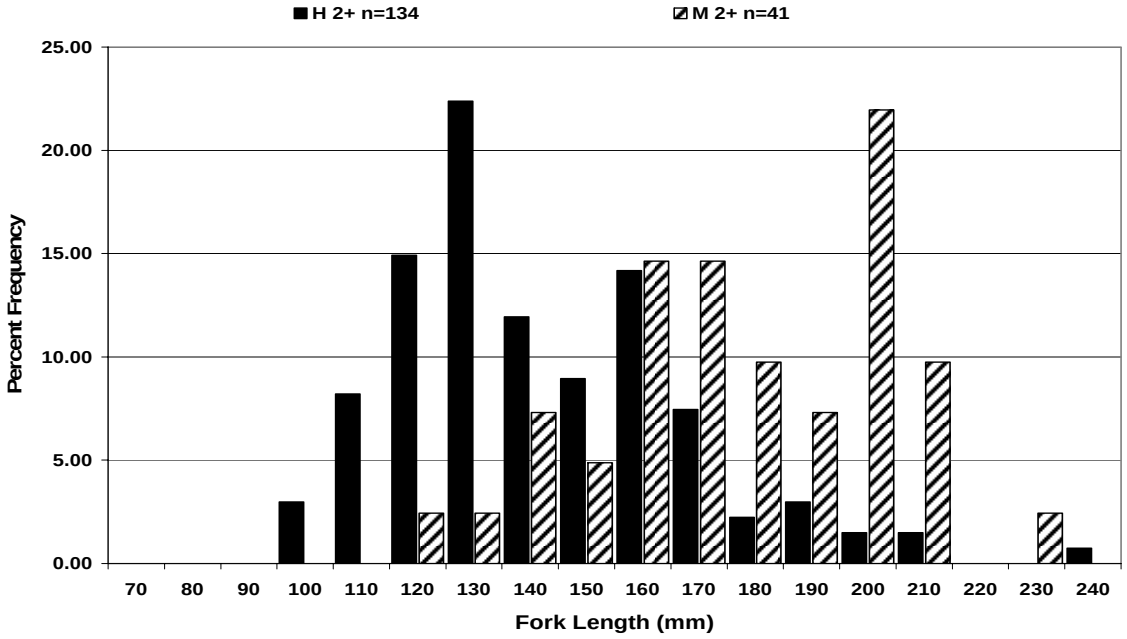


Figure 5 Length frequency histogram for age 2+ *O. mykiss* from two different areas of the Walla Walla River Basin. H 2+ fish are from four headwater reaches, N. F. Walla Walla, N. F. Touchet, Griffin Fork of the S.F. Touchet and West Pattit Creek. M 2+ fish are from mid-basin reaches of Mill Creek and the mainstem Walla Walla River near Milton-Freewater (from Contor et al. 2003).

Sex Ratio

The percent females of natural steelhead adults captured at Nursery Bridge Dam averaged 74% and ranged from 69-76% from 1993 to 2001. This is a typical sex ratio for adult steelhead in the adjacent Umatilla River Basin (Kissner 2003). At Nursery Bridge, hatchery female steelhead averaged 68% and ranged from 58-75% (Table 4).

Table 4. The number of steelhead captured at Nursery Bridge by origin and gender from 1993-2001 (CTUIR and ODFW unpublished data).

	Natural Steelhead					**Hatchery Steelhead**				
	Total	**Total**	**%**	**%**		**Total**	**Total**	**%**	**%**	
Year	**F**	**M**	**F**	**M**	**Total**	**F**	**M**	**F**	**M**	**Total**
1992-93	548	174	75.9%	24.1%	722	17	9	65.4%	34.6%	26
1993-94	321	101	76.1%	23.9%	422	2	2	50.0%	50.0%	4
1994-95	242	98	71.2%	28.8%	340	19	8	70.4%	29.6%	27
1995-96	177	81	68.6%	31.4%	258	15	5	75.0%	25.0%	20
1996-97	159	72	68.8%	31.2%	231	18	13	58.1%	41.9%	31
1997-98	223	79	73.8%	26.2%	302	12	6	66.7%	33.3%	18
1998-99	171	53	76.3%	23.7%	224	5	2	71.4%	28.6%	7
1999-00	305	104	74.6%	25.4%	409	12	4	75.0%	25.0%	16
2000-01	433	162	72.8%	27.2%	595	29	11	72.5%	27.5%	40
Average	**287**	**103**	**73.6%**	**26.4%**	**389**	**14**	**7**	**68.3%**	**31.7%**	**21**

Spawning Distribution and Timing

Adult summer steelhead enter the Walla Walla River as early as September or as late as the following spring and spawn during March, April and May. Low flows in the Walla Walla and Touchet Rivers often prevent or inhibit adult steelhead from migrating above the mouth of the Touchet River until December in most years (Walla Walla Subbasin Plan 2004). Known spawning areas are identified in Figure 6. Progeny of adults that spawn in the mid river areas are likely to have low survival due to poor summer rearing habitat, unless they can find refuge areas prior to low summer flows. Considerable variability in redd counts occurs between and within years and survey reaches. For example, on the South Fork of the Walla Walla surveyors found 0.34 redds/mile in 1999 and 4.3 redd/mile in 2001. No redds were observed in Couse Creek during 2000 while 49 were counted in 2002 (Kissner and Contor 2003). Mendel (et al. 2000, 2001, 2002, 2004) reported similar variations; in 2003 redd/mile in the Touchet Basin ranged from 0.6 to 4.5 while in 1999 redd/mile ranged from 2.0 to 20.

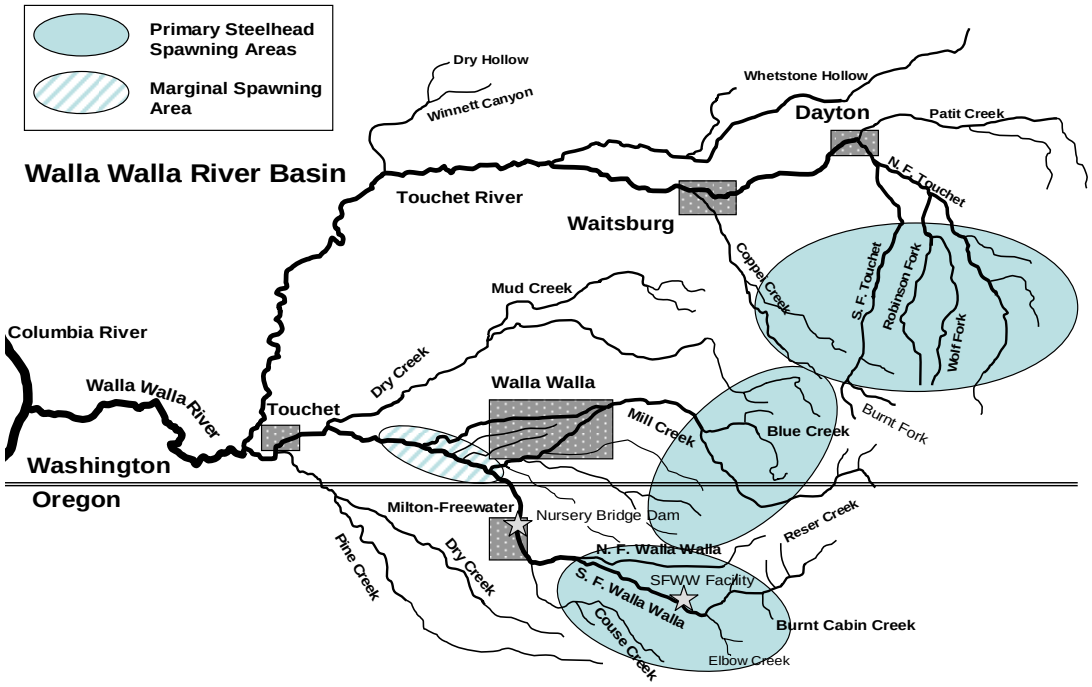


Figure 6. Primary summer steelhead spawning areas in the Walla Walla River Basin.

Juvenile Life-History, Migration and Distribution

Spawning surveys, electrofishing, juvenile trapping, PIT-tagging, and adult telemetry studies all provided information about steelhead life-histories and distribution in the Walla Walla Basin. Steelhead juveniles have a diverse life-history and may migrate from the headwaters at age 1+ (as small as 80 mm) through age 3+. Based on current information, we estimate that about 80-90% of the steelhead smolts move into the Columbia after their second winter at age 2+ (Contor et al. 2003). Juvenile steelhead utilize the headwaters and higher quality mid-basin reaches during the summers for rearing. Based on out-migrant trap data, a large number of juvenile steelhead drop down into the mid and lower reaches at the onset of fall prior to their spring migration (Contor et al. 2003).

Figure 7 represents how fish use the basin in their various life-history stages. The lower mainstem section begins at the mouth and extends up to the mouth of Mill Creek. Lower tributaries include the lower Touchet (mouth to Waitsburg), Pine Creek, both Dry Creeks and Mud Creek (near Milton-Freewater). The middle mainstem section stretches from the Mill Creek confluence upstream to Nursery Bridge Dam in Milton-Freewater. The middle tributaries include the Touchet from Waitsburg to Dayton, Mill Creek from the mouth to Blue Creek and Yellowhawk Creek and the other foothill streams such as Russell, Couse, and Cottonwood creeks. The upper mainstem and tributaries include the remainder of the basin from the middle reaches to the foothills and Blue Mountains.

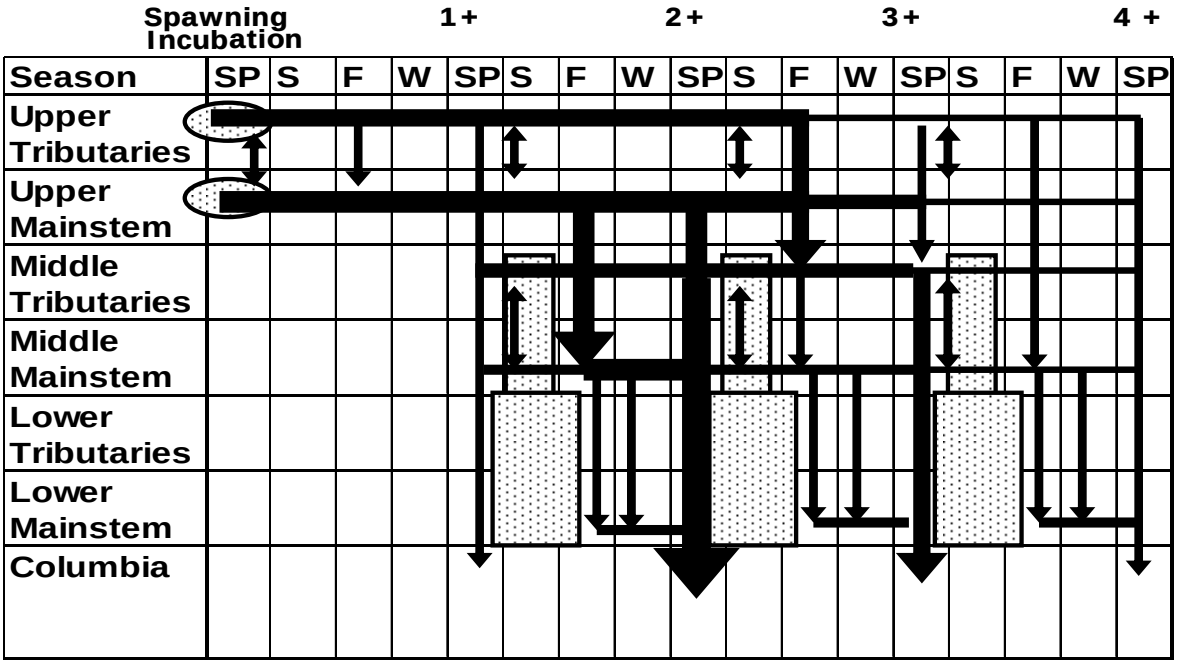


Figure 7. Preliminary summer steelhead life-history diagram for the Walla Walla River Basin. The shaded ovals represent potential redd scour from high flows. The shaded squares represent impacts from high water temperatures and lack of instream flow.

Juvenile *O. mykiss* have also been found in ephemeral streams during the spring and appear to use these habitats seasonally as conditions allow (Contor et al. 2003). During the summer, *O. mykiss* have been found wherever there is sufficient water with suitable temperatures (Figure 8). Summer rearing densities of juvenile *O. mykiss* in the primary habitat areas generally range from 10 to 70 fish/100 m^2. Densities over 200 fish/100 m^2 have been documented in some locations. Year to year variation can be substantial and observed densities in marginal habitats have ranged from 0 to 10 fish/100 m^2 (Contor et al. 2003, Mendel et al. 2000, 2001, 2002, and 2004, Schwartz et al. draft 2005).

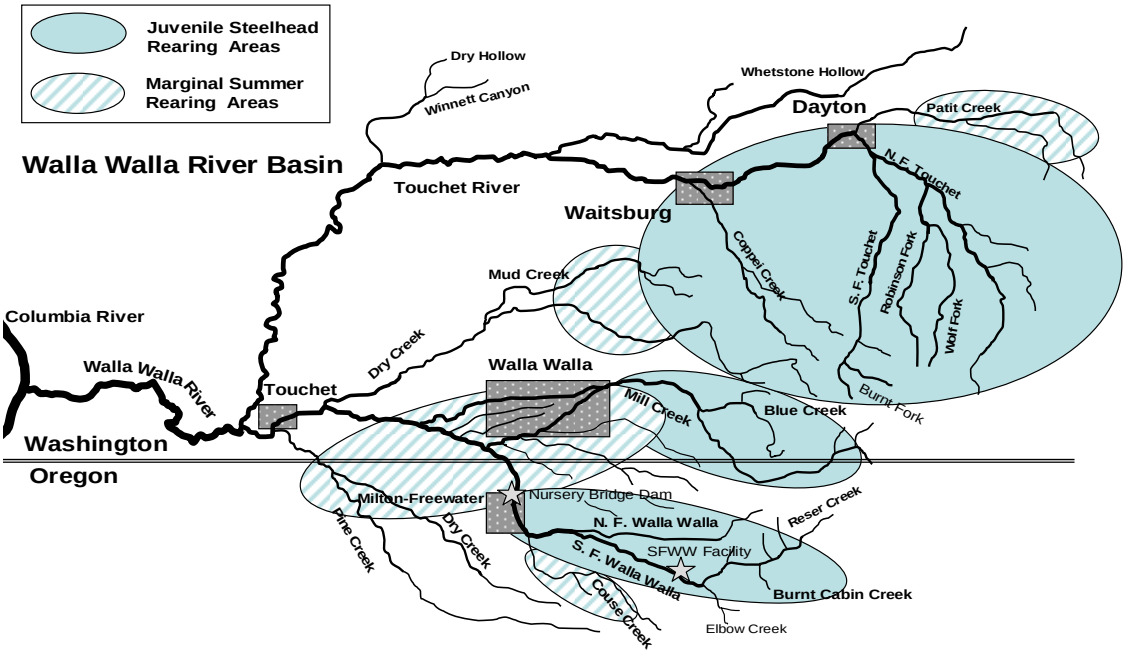


Figure 8. Summer distribution of juvenile *O. mykiss* in the Walla Walla River Basin.

Genetics
Summer steelhead in the Walla Walla River Basin are closely related to Umatilla and Snake River steelhead but have significant and unique genetic characteristics. Narum (et al. 2003) found evidence of genetic structure between populations from the Touchet and Walla Walla Rivers. In fact there was more similarity between Umatilla River steelhead and lower Snake River steelhead than between Touchet and Walla Walla River Steelhead (Narum et al. 2004). This study also suggests that the Snake River origin hatchery steelhead have not significantly interbred with either Walla Walla or Touchet River endemic steelhead. Narum also found some divergence between resident and anadromous forms within the Walla Walla but not the Touchet. Tests of Hardy-Weinberg equilibrium indicated that both anadromous and resident populations were in equilibrium but mixed life-history collections were out of equilibrium.

2.2.2) Status of ESA-listed salmonid population(s) affected by the program.

- **Describe the status of the listed natural population(s) relative to "critical" and "viable" population thresholds.**

The Walla Walla River Mid Columbia River summer steelhead run is listed as threatened. The Interior Columbia Basin Technical Recovery Team (ICTRT) is currently developing "critical" and "viable" thresholds for this population. In the preliminary guidance document for viable salmonid populations, the ICTRT described population attributes for the Touchet River and Walla Walla River populations. Both populations, when at viable levels, would be expected to have an abundance of 1,000 adults over a full brood cycle. The structure of the Touchet River population was considered to be small and/or linear, whereas, the Walla Walla River population was considered to be dendritic with multiple spawning aggregations (ICTRT 2004). The designation of structure categories for these populations relate to the level of extinction risk for the population based on the present conditions compared to

historical spatial distribution, life-history strategies, genetic variation, and natural spawner composition. Final viable salmonid population criteria for the Touchet River and Walla Walla River summer steelhead populations are expected in 2005.

- **Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.**

These data or measures are just now being evaluated by the Walla Walla Basin Natural Production M&E (WWBNPME) project.

- **Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.**

Abundance

Touchet River steelhead adult returns as estimated at Dayton, Washington have ranged from a low of 210 in 1991 to a high of 1094 in 1988 (Walla Walla Subbasin Plan, 2004). Total returns have been comprised of 80 to 92% natural origin adults. The last three years of available adult counts at Dayton were all under 300 fish (Table 5).

Table 5. Summer steelhead adult return estimates for the Touchet River at Dayton (WDFW data, Walla Walla Subbasin Plan 2004).

Year	Natural	Hatchery	Total	% Natural
1987	334	29	363	92
1988	1006	88	1094	92
1989	214	19	233	92
1990	332	29	361	92
1991	193	17	210	92
1992	374	32	406	92
1993	484	36	520	93
1994	358	19	377	95
1995	388	96	484	80
1996			No Data	
1997			No Data	
1998	385	43	428	90
1999	184	27	211	87
2000	202	18	220	92
2001	211	47	258	82

Steelhead adults returning to the upper Walla Walla River have been trapped at Nursery Bridge Ladder in Milton-Freewater since 1993 (Table 4). Adult returns have ranged from a low of 231 during the 1996-96 return year to a high of 722 in 1992-93 return. All hatchery-origin fish captured at the Nursery Bridge Ladder trap were sacrificed. Depending on flows, Nursery Bridge Dam is not a complete barrier to steelhead passage and some fish pass over the dam and do not use the ladder. ODFW conducted mark recapture studies from 1993 to 2000 and found that between 11 and 34 percent of adult steelhead passed Nursery Bridge Dam without being captured (Tim Bailey, ODFW Pendleton, unpublished data).

Videotape enumeration replaced trapping at Nursery Bridge beginning with the 2001-02 return season. Origin and sex of adult steelhead returns are not available since videotaping began. In addition, hatchery fish are no longer removed and the number of fish bypassing the video area is not estimated. The total upstream migrant steelhead enumerated by the video count was 1205, 547 and 381 for the 2001-02, 2002-03 and 2003-04 migration years respectively.

- **Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.**

Ratio of Hatchery Origin Adults in the Natural Spawning Population
At Nursery Bridge only five percent of the total adult steelhead captured were of hatchery origin from 1993 to 2001 (Table 5; CTUIR and ODFW unpublished data). These fish are most likely of non-native Lyons Ferry Hatchery stock and were removed to minimize the interaction with native steelhead spawning naturally above Nursery Bridge. However, video taping replaced trapping operations at Nursery Bridge in 2001 and hatchery fish now have unrestricted access to the headwaters.

In the Touchet River, the escapement above the Dayton weir has ranged from 80 to 92% natural origin adults. These hatchery adults are also most likely of non-native Lyons Ferry Hatchery stock as well as those observed spawning in the mainstem below the mouth of Mill Creek. Summer rearing conditions in these mid and lower sections of Walla Walla are marginal for salmonids and few juvenile salmonids have been observed in the lower reaches during the summer (Contor and Sexton 2003, Schwartz et al. draft 2005, Mendel et al. 2000, 2001, 2002, 2004).

2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of listed fish in the target area, and provide estimated annual levels of take.

- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.

Activities associated with the Walla Walla reintroduction program that may lead to take of listed salmonid populations include monitoring and evaluation and broodstock collection. Monitoring and evaluation of the spring Chinook reintroduction program will occur as part of the currently on-going WWBNPME project. Current tasks under WWBNPME project include monitoring and evaluation of the spring Chinook adult outplanting program and monitoring and evaluation of the smolt release program will be incorporated into existing activities. No new monitoring and evaluation activities directly associated with the smolt release program are anticipated. WWBNPME monitoring and evaluation activities are currently permitted by both NOAA Fisheries and USFWS under Section 10 permits #1365 and TE844468-5, respectively. Refer to these Section 10 permits for discussion of potential take activities and take levels.

At this point in-basin collection of broodstock for the release program is not proposed. In the future, as adult returns from the program are realized broodstock are anticipated to be

collected at Nursery Bridge Dam. In-basin trapping of adult spring Chinook for broodstock may result in migrational delay and handling mortality of incidentally captured summer steelhead and bull trout. Holding of broodstock collected at Nursery Bridge Dam for this program would occur at the South Fork Walla Walla Brood Holding and Spawning Facility. Operations at the South Fork facility would not change from existing activities at the facility associated with holding and spawning of adults for the Umatilla Hatchery program which are covered under the Umatilla Hatchery spring Chinook HGMP. For description of hatchery activities that may lead to take of listed salmonid populations associated with on-station fish culture practices at Carson NFH refer to the Carson NFH HGMP.

- **Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish**.

There is no past take history with this program as 2005 will be the first year of smolt releases. For past take history associated with the monitoring and evaluation program refer to the WWBNPME Section 10 permit annual reports. For past history of take associated with on-station fish culture practices at Carson NFH refer to the Carson NFH HGMP.

- **Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).**

For projected annual take levels associated with the monitoring and evaluation program refer to the WWBNPME Section 10 permits. For projected annual take levels associated with on-station fish culture practices at Carson NFH refer to the Carson NFH HGMP. For projected annual take levels associated with holding and spawning activities at the South Fork facility refer to the Umatilla Hatchery spring Chinook HGMP. Table 6 contains projected annual take levels of summer steelhead directly related to broodstock collection activities at Nursery Bridge Dam if they should occur in the future.

Table 6. Estimated listed salmonid take levels of by hatchery activity.

Listed species affected: ***Summer Steelhead*** **ESU/Population:** ***Mid Columbia River*** **Activity:** ***Broodstock Collection***				
Location of hatchery activity: ***Walla Walla River – Nursery Bridge Dam*** **Dates of activity:** ***May 1 – June 15*** **Hatchery program operator:** ***CTUIR***				
Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)			**<250**	
Capture, handle, tag/mark/tissue sample, and release d)			**<250**	
Removal (e.g. broodstock) e)				
Intentional lethal take f)				

Listed species affected: ***Summer Steelhead*** **ESU/Population:** ***Mid Columbia River*** **Activity:** ***Broodstock Collection***				
Location of hatchery activity: ***Walla Walla River – Nursery Bridge Dam*** **Dates of activity:** ***May 1 – June 15*** **Hatchery program operator:** ***CTUIR***				
Unintentional lethal take g)			**<5**	
Other Take (specify) h)				

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
e. Listed fish removed from the wild and collected for use as broodstock.
f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.
g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
h. Other takes not identified above as a category.

- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

If take levels are anticipated to exceed projections, consultation will be re-initiated with NOAA Fisheries and co-managers to modify trapping operations at Nursery Bridge Dam.

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. *Hood Canal Summer Chum Conservation Initiative*) or other regionally accepted policies (e.g. the NPPC *Annual Production Review* Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.

The program is consistent with Mitchell Act language and has been incorporated into the *US v. Oregon* Interim Management Agreement under the Columbia River Fish Management Plan. The program is also consistent with the NPCC Walla Walla Subbasin Plan and will follow the 1995 Integrated Hatchery Operations Team (IHOT) Policy and Procedures for Columbia Basin Anadromous Salmonid Hatcheries.

3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.

See Section 3.1

3.3) Relationship to harvest objectives.

Carson spring Chinook are not listed under ESA. It is anticipated that spring Chinook adults from this program will provide benefits to Columbia River fisheries. Adults from this

program will be managed in mainstem Columbia River fisheries under the auspices of *US v. Oregon* to achieve the NMFS biological opinion jeopardy standards for Snake River spring/summer Chinook of 5 to 7 percent harvest rate. The production program in the Walla Walla Subbasin is not expected to add adverse effects to listed species or other stocks of concern beyond those currently allowable under non-jeopardy biological opinions for harvest in mainstem fisheries. In the future adults from this program will also contribute to tributary fisheries in the Walla Walla Subbasin. A spring Chinook harvest plan for the Walla Walla Subbasin has not been developed at this point.

3.3.1) Describe fisheries benefiting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available. *Also provide estimated future harvest rates on fish propagated by the program, and on listed fish that may be taken while harvesting program fish.*

No harvest data exists for this program. It is anticipated that mainstem and Walla Walla tributary fisheries will both benefit form this program. For historical harvest data associated with the Carson NFH program refer to the Carson NFH HGMP.

3.4) Relationship to habitat protection and recovery strategies.

Spring Chinook have essentially been absent from the Walla Walla River subbasin for over 75 years. Losses have generally been attributed to the development of agriculture and related irrigation diversions and channel dewatering within the basin. In addition, the construction of Federal hydropower dams on the Columbia River changed the character of the mainstem migration corridor from a free-flowing river to a series of impoundments altering juvenile and adult migratory patterns. While the passage, flow, and habitat concerns have not been completely addressed, significant progress has been made in all these areas.

Minimum instream flows of 18 and 25 cfs are now required to be maintained in the mid and upper mainstem Walla Walla River as part of the United States Fish and Wildlife Service (USFWS) Amended Civil Penalty Settlement Agreement (2001) with basin irrigation districts. The US Army corps of Engineers has initiated a Feasibility study for instream flow enhancement which includes irrigation conservation, water right purchase, and storage components. In addition, juvenile and adults passage improvements have been ongoing since 1997. Improvements include removal of two decommissioned diversion structures, construction of five new or improved juvenile screen and bypass facilities, and four new or upgraded ladders have been built. In addition, two ditch consolidation projects have been completed eliminating two surface diversions in the subbasin. There are four additional screening and two fishway projects still in the planning stages.

A multitude of habitat improvement projects have been implemented by various agencies throughout the subbasin. The Inventory Section of the Subbasin Plan (Walla Walla County and Walla Walla Basin Watershed Council 2004) contains a comprehensive listing of the passage improvement and habitat projects. Based on the observed figures from the adult outplanting program a conservative spawner escapement number for the upper mainstem and South Fork is 1,035 adults. This number is very close to the estimated spawner capacity of 1,000 adults identified for this same area by the Walla Walla Subbasin Plan EDT model (Walla Walla County and Walla Walla Basin Watershed Council 2004) under “properly functioning conditions”.

3.5) Ecological interactions.

(1) The program may be negatively impacted by a variety of freshwater and marine predators such as northern pikeminnows, Caspian terns, and pinnipeds which could significantly reduce overall survival rates of program fish.

(2) Co-occurring natural steelhead populations in the Walla Walla River and ESA listed salmon and steelhead populations in the mainstem Columbia River could be negatively impacted by co-mingling with program fish in migration corridors. Impacts could potentially occur from competition for food, predation, disease transmission, or density dependent effects. In order to minimize the potential for any of these effects to occur, program fish are released as full term yearling smolts during the major outmigration period for spring Chinook observed in the neighboring Umatilla Subbasin. The intent of these actions is to limit interaction with listed steelhead juveniles within the subbasin by releasing fish at a size and time which would expedite outmigration from the subbasin. The program will also follow the protocols as outlined by IHOT (1995) to minimize the potential for disease transmission and/or transfer to occur.

(3) Other salmonid species that naturally spawn in the target stream may positively impact program fish by contributing nutrients from decaying carcasses that increase productivity of the Walla Walla River.

(4) Bull trout and summer steelhead pre-smolts rearing in the Walla Walla River may be positively impacted by the program by utilizing program fish as a food base. The program may also benefit these species by contributing nutrients from decaying carcasses that increase productivity of the Walla Walla River. Reintroduction of spring Chinook to the Walla Walla Subbasin may also play an important role in community ecology since these populations historically existed sympatrically in the basin. In addition, wild co-occurring salmonid populations may benefit in the migration corridor areas. Migrating hatchery fish may overwhelm predator populations, providing a protective effect to co-occurring wild populations.

SECTION 4. WATER SOURCE

4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

Refer to Carson NFH HGMP.

4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

Refer to Carson NFH HGMP.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

In the future, if returning spring Chinook are retained for broodstock from the Walla Walla River, they would be collected at a fish trap located in the Nursery Bridge Dam ladder. The facility consists of a vertical slot fish ladder, Alaskan steeppass, adult holding pond/trap, anesthetic tank and recovery tank. Adults ascending the ladder are blocked from volitionally exiting the ladder and diverted up the Alaskan steeppass into the trap/holding pond. The dimensions of the holding pond are 10' wide by 24' long by 3.5' deep (~850 ft3). The holding pond is covered to prevent access and jumpouts. The water supply for the holding pond is supplied directly from the Walla Walla River at a rate of ~650 gpm. The recovery tank exits directly into the ladder allowing fish to volitionally migrate upstream through the upper steps of the ladder. The dimensions of the recovery tank are 6.5' wide by 13.5' long. Depth is dependent on operating level of the ladder and could range from 4.5'-6.5' deep (~400-570 ft3) with a flow rate of ~425 gpm. There are no personnel stationed on site and no alarms or emergency backup systems are located at the trap. The construction and operation of the facility has no effect on the critical habitat for summer steelhead. For a description of Carson NFH brood collection facilities refer to the Carson NFH HGMP.

5.2) Fish transportation equipment (description of pen, tank truck, or container used).

Fish will be transported from Carson NFH in both ODFW and CTUIR fish liberation units. These units are all diesel operated tractor-trailers and range in size from 3,000 to 5,500 gallons with 6-12 inch discharge openings. The units are equipped with both liquid oxygen and electric aeration to reduce fish stress during transport. ODFW liberation protocols are used as the basic guideline for hauling operations.

5.3) Broodstock holding and spawning facilities.

The South Fork Walla Walla facility is located east of Milton-Freewater, Oregon (Figure 6). The facility is located on the South Fork of the Walla Walla River at approximately rm 5.2. The facility includes a water intake system with automatic screen cleaning that meets current NOAA Fisheries screening criteria, pump station having a pumping capacity of 8,700 gpm, ozone water treatment system, settling pond, five adult holding ponds (each 90 x 10 x 5 foot effective water depth; 4,500 cubic feet), mechanical fish crowder, alarm system, standby generator, chemical storage and spawning buildings and two homes for night watch personnel. The spawning building includes a fish lift, electroshock anesthesia system, sorting and spawning facilities, wet and dry storage rooms, walk-in cooler/freezer, and restroom and office space. For a description of Carson NFH brood holding and spawning facilities refer to the Carson NFH HGMP.

5.4) Incubation facilities.

For a description of Carson NFH incubation facilities refer to the Carson NFH HGMP.

5.5) Rearing facilities.

For a description of Carson NFH rearing facilities refer to the Carson NFH HGMP.

5.6) Acclimation/release facilities.

NA – fish are to be direct stream released into the South Fork Walla Walla River (RM 7.8).

5.7) Describe operational difficulties or disasters that led to significant fish mortality.

There have not been any operation difficulties or disasters at Carson NFH in the past 6 years.

5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

There are no backup systems or alarms at the trapping facility at the Nursery Bridge Dam ladder in the event this facility is used for broodstock collection in the future. The South Fork holding facility has an ozone effluent treatment system to minimize any potential disease transmission to the South Fork Walla Walla River. For a description of Carson NFH risk aversion measures refer to the Carson NFH HGMP.

SECTION 6. BROODSTOCK ORIGIN AND IDENTITY

Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.

6.1) Source.

Carson stock spring Chinook from Carson NFH or other Carson stock hatchery stations and the Walla Walla River.

6.2) Supporting information.

6.2.1) History.

From 1955 thru 1964 approximately 500 spring Chinook salmon were trapped annually at Bonneville Dam on the Washington side of Columbia River and transported to the holding ponds at Carson NFH. Genetic data indicate that the Carson stock was derived from a mixture of upper Columbia and Snake River populations passing Bonneville Dam (Campton 2000 Draft). The adult fish were held and spawned, with their progeny reared and released at Carson. The first returns to Carson NFH occurred in 1959 when 107 fish entered the hatchery (99 jacks, 2 adult females and 6 adult males). This run of spring Chinook has been maintained since. Carson origin spring Chinook eggs, fry, and fingerlings have been transferred to a wide range of localities within the Northwest including Alaska. In addition to Carson NFH, this stock is being currently being propagated at many locations, including Leavenworth and Little White Salmon NFHs, Ringold Springs Hatchery, and Umatilla Hatchery.

6.2.2) Annual size.

Not applicable to Carson NFH. Broodstock collection guidelines are currently being developed as part of the Walla Walla Hatchery Master Plan. It is anticipated that these guidelines would be completed prior to brood being collected for this program from the Walla Walla River

6.2.3) Past and proposed level of natural fish in broodstock.

Not applicable to Carson NFH.

6.2.4) Genetic or ecological differences.

Genetic or ecological difference between hatchery and "natural" stocks is unknown. However, it is likely that little genetic or ecological differences exist between the fish returning to Carson NFH and those fish spawning naturally in Walla Walla River. Returning natural spring Chinook to the Walla Walla River are likely progeny of Carson stock adult outplants from Ringold Springs Hatchery and the Umatilla River.

6.2.5) Reasons for choosing

Carson stock spring Chinook have been used in the initial adult outplanting reintroduction efforts and are the only founder stock readily available.

6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

Not applicable as spring Chinook in the Walla Walla River have been extirpated for over 75 years and reintroductions have been made using non-listed Carson stock.

SECTION 7. BROODSTOCK COLLECTION

7.1) Life-history stage to be collected (adults, eggs, or juveniles).

Adult spawners returning to Carson NFH are to be used initially. In the future broodstock may be collected from the Walla Walla River. These fish would be held and spawned at the South Fork Walla Walla facility and eggs supplied to Carson NFH for rearing.

7.2) Collection or sampling design.

Adult spring Chinook return to Carson NFH from May to August. Spawning occurs in August and early September. Fish are collected from throughout the spectrum of the run. Broodstock collection guidelines are currently being developed for the Walla Walla River.

7.3) Identity

Voluntary hatchery returns are used in the spawning process. If any "natural" spring Chinook voluntarily enter the hatchery, they are incorporated into the brood stock. However,

because spring Chinook are not native to the Wind River, these fish also likely of Carson stock origin. Unmarked spring Chinook currently returning to the Walla Walla River are likely Carson stock progeny from the adult outplanting program. Marked hatchery adults returning in the future would be from Carson stock releases.

7.4) Proposed number to be collected:

7.4.1) Program goal (assuming 1:1 sex ratio for adults):

Current program goal for Carson NFH is to spawn 500 females and 500 males. The 1,400 adult escapement goal allows for maintaining the 1:1 spawning criteria, to cull eggs from high titer BKD infected fish, and for any pre-spawning mortalities that may occur during the extended holding period of adults at the hatchery. The Walla Walla component (250,000 smolts) comprises 17.6% of the total Carson NFH program (1,420,000 smolts) and would require 246 adults be retained and 176 spawned. If broodstock are collected in-basin, 173 adults would need to be collected to produce 250,000 smolts based on Umatilla program performance. In addition, jacks would be collected at a rate of 1:10 adult males.

7.4.2) Broodstock collection levels for the last twelve years (e.g. 1988-99), or for most recent years available:

Refer to Carson NFH HGMP.

7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.

Refer to Carson NFH HGMP. In the future, if broodstock are collected from the Walla Walla River, all adults trapped but not retained for brood would be allowed to spawn naturally in the Walla Walla River. Surplus adults collected for brood in excess of egg take needs would be outplanted for natural spawning.

7.6) Fish transportation and holding methods.

No transportation necessary at Carson NFH. If broodstock are collected from the Walla Walla River, fish would be loaded onto diesel operated tractor-trailers and range in size from 3,000 to 3,500 gallons with 12 inch discharge openings for transport to the South Fork Walla Walla facility. Transfer time is approximately 30 minutes. The units are equipped with both liquid oxygen and electric aeration to reduce fish stress during transport. ODFW liberation protocols are used as the basic guideline for hauling operations. It is anticipated that brood collected at Nursery Bridge Dam would be treated similar to brood collected for the Umatilla program. On the day of collection, each fish is injected with Oxytetracycline 100 and Erythromycin 200 at a rate of approximately 10mg/kg/fish. The fish are given a second injection at the same dosage rate in July at the South Fork Walla Walla facility. Beginning in June, fish are treated with formalin three days per week to help control fungus. A one-hour flow-through treatment at approximately 167 ppm is used.

7.7) Describe fish health maintenance and sanitation procedures applied.

Refer to Carson NFH HGMP. CTUIR follows guidelines developed by IHOT.

7.8) Disposition of carcasses.

Refer to Carson NFH HGMP. CTUIR typically landfills all carcasses after fish health examination.

7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.

Natural summer steelhead headed for the upper Walla Walla Subbasin have to pass through Nursery Bridge Dam and the later portion of the steelhead run would be trapped during broodstock collection operations. If take levels are anticipated to exceed projections, consultation will be re-initiated with NOAA Fisheries and co-managers to modify trapping operations at Nursery Bridge Dam.

SECTION 8. MATING

Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.

8.1) Selection method.

Refer to Carson NFH HGMP. Broodstock collection and spawning guidelines are currently being developed for the Walla Walla River. If brood are collected from the Walla Walla River it is anticipated that mating protocols would follow those used in the Umatilla program. Beginning in mid August, fish are sorted and spawned once per week. A spawning ratio of 1:1 is utilized whenever possible. If a shortage of males occurs, a ratio of two males to four females may be used. Eggs from each female are fertilized individually and the eggs from four females are pooled to form one family group.

8.2) Males.

Refer to Carson NFH HGMP. Broodstock collection and spawning guidelines are currently being developed for the Walla Walla River. If brood are collected from the Walla Walla River it is anticipated that protocols would follow those used in the Umatilla program. A spawning ratio of 1:1 is utilized whenever possible. If a shortage of males occurs, a ratio of two males to four females may be used. Jacks are incorporated into the broodstock at the rate of 1:10 adult males with the intent that they are spawned at the same rate. Back up males or repeat male spawners are not used.

8.3) Fertilization.

Refer to Carson NFH HGMP. Broodstock collection and spawning guidelines are currently being developed for the Walla Walla River. If brood are collected from the Walla Walla River it is anticipated that protocols would follow those used in the Umatilla program. A spawning ratio of 1:1 is utilized whenever possible. If a shortage of males occurs, a ratio of two males to four females may be used. Eggs from each female are fertilized individually and the eggs from four females are pooled to form one family group. After pooling, egg groups are rinsed and water hardened in a 75ppm iodophor solution.

8.4) Cryopreserved gametes.

Cryopreservation of gametes is not performed at Carson NFH and would not be anticipated for the Walla Walla River program.

8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

Not applicable to Carson NFH or Walla Walla River program.

SECTION 9. INCUBATION AND REARING -

Specify any management *goals* (e.g. "egg to smolt survival") that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

9.1) Incubation:

9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.

Refer to Carson NFH HGMP.

9.1.2) Cause for, and disposition of surplus egg takes.

Refer to Carson NFH HGMP

9.1.3) Loading densities applied during incubation.

Refer to Carson NFH HGMP.

9.1.4) Incubation conditions.

Refer to Carson NFH HGMP.

9.1.5) Ponding.

Refer to Carson NFH HGMP.

9.1.6) Fish health maintenance and monitoring.

Refer to Carson NFH HGMP.

9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.

Refer to Carson NFH HGMP.

9.2) Rearing:

9.2.1) Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to smolt) for the most recent twelve years (1988-99), or for years dependable data are available.

Refer to Carson NFH HGMP.

9.2.2) Density and loading criteria (goals and actual levels).

Refer to Carson NFH HGMP.

9.2.3) Fish rearing conditions

Refer to Carson NFH HGMP.

9.2.4) Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.

Refer to Carson NFH HGMP.

9.2.5) Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.

Refer to Carson NFH HGMP.

9.2.6) Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).

Refer to Carson NFH HGMP.

9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.

Refer to Carson NFH HGMP.

9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.

Refer to Carson NFH HGMP.

9.2.9) Indicate the use of "natural" rearing methods as applied in the program.

Refer to Carson NFH HGMP.

9.2.10) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish under propagation.

Refer to Carson NFH HGMP.

SECTION 10. RELEASE

Describe fish release levels, and release practices applied through the hatchery program.

10.1) Proposed fish release levels.

Age Class	Number	Size (fpp)	Release Date	Location
Yearling	250,000	18	March 15 – April 15	South Fork Walla Walla River

10.2) Specific location(s) of proposed release(s).

Stream, river, or watercourse: South Fork Walla Walla River
Release point: rm 7.8
Major watershed: Walla Walla River
Basin or Region: Columbia River

10.3) Actual numbers and sizes of fish released by age class through the program.

Refer to Carson NFH HGMP

10.4) Actual dates of release and description of release protocols.

There have been no previous releases into the Walla Walla River. The program goal is to release 250,000 yearlings direct stream released into the South Fork Walla Walla River in March/April. This time period is during the main migration period for natural spring Chinook smolts observed in the Umatilla River. Refer to Carson NFH HGMP for on-station releases.

10.5) Fish transportation procedures, if applicable.

Fish will be transported from Carson NFH in both ODFW and CTUIR fish liberation units. These units are all diesel operated tractor-trailers and range in size from 3,000 to 5,500 gallons with 6-12 inch discharge openings. The units are equipped with both liquid oxygen and electric aeration to reduce fish stress during transport. ODFW liberation protocols are used as the basic guideline for hauling operations – smolts would be loaded at approximately 1pound per gallon of water. Transport time is estimated at four hours.

10.6) Acclimation procedures.

All fish will be direct stream released.

10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.

All fish are adipose clipped prior to release to identify them as hatchery fish upon return. Additionally, 50,000 fish are coded-wire tagged for production evaluation. A portion of the release is PIT tagged as part of WWBNPME evaluations.

10.8) Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

Not applicable.

10.9) Fish health certification procedures applied pre-release.

Refer to Carson NFH HGMP.

10.10) Emergency release procedures in response to flooding or water system failure.

Fish will be released directly from Carson NFH into the Wind River.

10.11) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

Fish are reared to smolt stage and released during the primary migration period to minimize the time spent in the migratory corridor. This minimizes potential interaction with any listed fish in the Walla Walla and Columbia rivers. In addition, pre-release disease sampling is conducted to ensure fish are generally in good health.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1) Monitoring and evaluation of "Performance Indicators" presented in Section 1.10.

11.1.1) Describe plans and methods proposed to collect data necessary to respond to each "Performance Indicator" identified for the program.

The WWBNPME project BPA statement of work outlines a complete work plan for assessing the program performance indicators.

11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.

The WWBNPME project is funded by BPA. The WWBNPME work plan includes tasks for assessing the program performance indicators.

11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

Potential take associated with monitoring and evaluation activities is discussed in Section 2.2.3. All monitoring and evaluation activities will attempt to minimize adverse effects to listed species.

SECTION 12. RESEARCH

12.1) Objective or purpose.

There is currently no research beyond normal program monitoring and evaluation.

12.2) Cooperating and funding agencies.

This program currently has no funding allocated for research.

12.3) Principle investigator or project supervisor and staff.

N/A

12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.

Not listed.

12.5) Techniques: include capture methods, drugs, samples collected, tags applied.

N/A

12.6) Dates or time period in which research activity occurs.

N/A

12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.

N/A

12.8) Expected type and effects of take and potential for injury or mortality.

N/A

12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached "take table" (Table 1).

N/A

12.10) Alternative methods to achieve project objectives.

No alternatives are proposed at this time.

12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.

N/A

12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.

N/A

SECTION 13. ATTACHMENTS AND CITATIONS

Literature Cited

Contor, Craig and Amy Sexton, editors. 2003. The Walla Walla Basin natural production monitoring and evaluation project. 1999-2002 progress report. The Confederated Tribes of the Umatilla Indian Reservation, Project No. 2000-030-00. Bonneville Power Administration, Portland Oregon.

Contor, Craig R., Brian Mahoney and Tim Hanson. 2003. Juvenile salmonid monitoring: In Craig R. Contor and Amy Sexton, editors. 2003. The Walla Walla Basin natural production monitoring and evaluation project. 1999-2002 progress report. The Confederated Tribes of the Umatilla Indian Reservation, Project No. 2000-030-00. Bonneville Power Administration, Portland Oregon.

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Mendel, Glen, Jeremy Trump and David Karl. 2002. Assessment of salmonid fishes and their habitat conditions in the Walla Walla River Basin of Washington: 2001 Annual Report. Project 1998-020-00. Bonneville Power Administration, Portland Oregon. 133 pages.

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SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

"I hereby certify that the information provided is complete, true and correct to the best of my knowledge and belief."

Name, Title, and Signature of Applicant:

Certified by_____ Date:_____

SECTION 15. PROGRAM EFFECTS ON OTHER (AQUATIC OR TERRESTRIAL) ESA-LISTED POPULATIONS. (Anadromous salmonid effects are addressed in Section 2)

15.1) List all ESA permits or authorizations for USFWS ESA-listed, proposed, and candidate salmonid and non-salmonid species associated with the hatchery program.

The USFWS has issued a letter (dated 3/18/2005) stating that the Walla Walla smolt release program is "not likely to affect" the listed bull trout population in the subbasin.

15.2) Describe USFWS ESA-listed, proposed, and candidate salmonid and non-salmonid species and habitat that may be affected by hatchery program.

LISTED

Common Name	Scientific Name	Status
Fish:		
Bull trout [1]	*Salvelins confluentus*	Threatened
Wildlife:		
Bald eagle	*Haliaeetus leucocephalus*	Threatened

[1] listing unit is the Columbia River Distinct Population Segment
[2] listing unit is the Middle Columbia River ESU

Wintering bald eagles (*Haliaeetus leucocephalus*) may occur in the subbasin. Wintering activities generally occur from October 31 through March 31.

Columbia Basin bull trout (*Salvelinus confluentus*) are listed as Threatened and occur in the project area. There are at least two bull trout life history types in the Walla Walla Basin; resident and fluvial. The ad-fluvial life history type, if it still exists, would include bull trout that migrate down to the mainstem Columbia River. In the Touchet River, juvenile and/or adult bull trout have been found from the spawning areas in the

headwaters down stream to Waitsburg; however most fish were found above Dayton. In the Walla Walla River some fish have been observed below the mouth of Mill Creek; but most are found above Milton-Freewater in the Walla Walla River and above the mouth of Blue Creek in Mill Creek.

PROPOSED

None

CANDIDATE

Common Name	Scientific Name
Columbia spotted frog	*Rana luteiventris*
Washington ground squirrel	*Spermophilus washingtoni*
Yellow-billed Cuckoo	*Coccyzus americanus*
Western Boreal Toad	*Bufo boreas*

CRITICAL HABITAT

Critical habitat for bull trout has been designated in subbasin.

15.3) Analyze effects.

Within the Walla Walla Basin the status of bull trout appears to be viable with a modestly robust population. In recent years redd counts in the South Fork Walla Walla River have been on an increasing trend (Table 7). Hatchery juveniles may provide a forage base benefit to bull trout.

Table 7. Number of Bull Trout Redds Observed Annually in the South Fork of the Walla Walla River since 1994 (Oregon Department of Fish and Wildlife data published in the Walla Walla Subbasin Plan 2004, Appendix AD4)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
143	111	184	180	276	431	336	483	330	362

There is no anticipated take of listed species as associated with operation of the program (see USFWS letter dated 3/18/2005).

15.4 Actions taken to minimize potential effects.

The conclusion at this time is that the program will not adversely affect bull trout (see USFWS letter dated 3/30/2005) or any other listed species.

15.5 References

USFWS (U.S. Fish and Wildlife Service). Letter to CTUIR re: Release of juvenile spring Chinook salmon in the Walla Walla River Basin. March 30, 2005.

Walla Walla County and Walla Walla Basin Watershed Council. 2004. Walla Walla Subbasin Plan. Prepared for the Northwest Power and Conservation Council.