HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

DRAFT

1.

Hatchery Program	Upper Yakima Coho Reintroduction Feasibility Project
Species or Hatchery Stock	Coho Salmon (Oncorhynchus kisutch)
Agency/Operator	Yakama Nation and Washington Department of Fish and Wildlife
Watershed and Region	Yakima River Subbasin/Columbia Plateau Province
Date Submitted	nya
Date Last Updated	nya

Section 1: General Program Description

1.1 Name of hatchery or program.

1. Upper Yakima Coho Reintroduction Feasibility Project

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

1. Coho Salmon (Oncorhynchus kisutch)
2. ESA Status: Not listed and not a candidate for listing

1.3 Responsible organization and individuals.

3.

Name (and title):	Joe Blodgett Fish Production Biologist and Facility Manager
Agency or Tribe:	Yakima Nation
Address:	P. O. Box 151, Toppenish, WA 98948
Telephone:	(509) 865-6262, Ext. 6706
Fax:	(509) 865- 6293
Email:	jblodgett@yakama.com

Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program.

4.

Co-operators	Role
Bonneville Power Administration	Funding Entity- Administrator
U.S. Bureau of Reclamation	Owner of facility land; and minor funding entity for facility upgrades and public education
U.S. Fish and Wildlife Service	Mitchell Act Funds (Willard Fish Production/Acclimation of Out of Basin Production); Decision on Listed Species;Fish Pathogology Monitoring & Analyses
National Marine Fisheries Service	Decision on Listed Species

1.4 Funding source, staffing level, and annual hatchery program operational costs.

5.

Funding Sources
Bonneville Power Administration
Yakama Nation
U.S. Bureau of Reclamation (Funds for facility improvements, public education, in-kind land land contribution)
Mitchell Act
nya
nya
nya

6.

Operational Information	Number
Full time equivalent staff	11
Annual operating cost (dollars)	1141042

Comments:

nc
9 scientific techs

2 management biologists for Marion Drain and Prosser Hatcheries

ABOVE OPERATIONAL INFORMATION (FULL-TIME STAFF AND ANNUAL OPERATING COST) IS APPLICABLE TO LOWER YAKIMA PROGRAMS (FALL CHINOOK AND COHO).

LITTLE WHITE SALMON/WILLARD NFH COMPLEX

13 full-time

Annual Operating Dollars

Little White Salmon/Willard NFH Complex is $1.14M for all programs.

Reviewer Comments:

nc
nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Fiander, W. Yakama Nation. Personal Communication. 12 May 2003.

1.5 Location(s) of hatchery and associated facilities.

2.

Broodstock source	Yakima River and Little White Salmon-Willard NFH Complex
Broodstock collection location (stream, RKm, subbasin)	Prosser Dam- Right Bank Fish Ladder, Yakima, RKm 75.4; and Little White Salmon NFH/ Little White Salmon/RKm 2.0/Little White Salmon
Adult holding location (stream, RKm, subbasin)	Prosser Hatchery (Off river of the Yakima River ~0.75 miles downstream of Prosser Dam , RKm 75.1, Yakima Subbasin; and Little White Salmon NFH/Little White Salmon/RKm 2.0/ Little White Salmon
Spawning location (stream, RKm, subbasin)	Prosser Hatchery (Off river of the Yakima River ~0.75 miles downstream of Prosser Dam , RKm 75.16Yakima Subbasin; and Little White Salmon NFH/Little White Salmon/RKm 2.0/ Little White Salmon
Incubation location (facility name, stream, RKm, subbasin)	Prosser Hatchery (Off river of the Yakima River ~0.75 miles downstream of Prosser Dam , RKm 75.16, Yakima Subbasin; and Willard NFH/Little White Salmon/RKm 6.5/Little White Salmon
Rearing location (facility name, stream, RKm, subbasin)	Prosser Hatchery (Off river of the Yakima River ~0.75 miles downstream of Prosser Dam , RKm 75.1, Yakima Subbasin; and Willard NFH/Little White Salmon/RKm 6.5/Little White Salmon

Comments:

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

1.6 Type of program.

8. Integrated

Comments:

text from Yakima River Coho HGMP:

Initially this was a production program designed to provide upriver production for the Tribal fisheries. Beginning in 1997 a transition occurred, adopting the program into the YKFP, changing the scope of the program towards supplementation with goal to establish self-sustaining populations in the basin. Harvest goals, however, have remained the same.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

1.7 Purpose (Goal) of program.

9. The purpose of this hatchery program is to provide harvest , to contribute to conservation/recovery and research and education.
10. the purpose of the program is mitigation for hydro impacts .

Comments:

text from Yakima River Coho HGMP:

The Yakima Coho Reintroduction Program?s short-term goal (Phase 1) is to determine the feasibility of re-establishing a naturally spawning coho population and a significant fall fishery for coho within the Yakima River Basin, while keeping adverse ecological impacts within acceptable limits.

The long-term goal (phase two) is to design and implement a hatchery production program based on outcomes from the Phase one feasibility study. The YKFP Policy Group will determine the course of actions to be pursued for the Phase Two program. For example, will it consist of supplementation of naturalized populations, harvest augmentation, or some other kind of production program. This decision will be consistent with YKFP goals and the U.S. vs. Oregon decision and the Columbia River Fisheries Management Plan (CRFMP).
nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

1.8 Justification for the program.

138

- Hatchery fish accessible to fisheries because the fish produced are differentially marked to enable selective harvest.
- Hatchery fish accessible to fisheries because the fish produced are available in sufficient number to the fisheries (location, time, gear) that are intended to benefit from the program (i.e. to meet the harvest goals).

Comments:

nc
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

nc
nc
nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
nds
nds
nds

1.9 List of program "Performance Standards".

11

The program adheres to the following fish culture guideline(s) and standard(s):
IHOT
PNFHPC
tribal
federal

Comments:

text from Yakima River Coho HGMP:

These are the program objectives as stated in the draft Yakima Coho Planning Status Report (2001) for the YKFP.

Experimental

-Determine the feasibility of re-establishing a sustainable, naturally spawning coho population in the Yakima Basin with sufficient productivity to sustain a meaningful in-basin fishery in most years.

Natural Production

-Optimize production of naturalized populations of coho with respect to abundance and distribution.

Ecological Interactions

-Minimize adverse impacts of coho reintroduction on Non-taxa Target of Concern (NTTOC).

-Limit losses of wild and hatchery coho smolts to native and exotic predators to levels that do not significantly limit coho production potential.

Genetic

-Establish a Yakima River coho stock with heritable life history traits adapted to the Yakima River Basin.

Harvest

-Expand harvest opportunities for treaty Tribal and sport fisheries inside and outside of the Yakima River Basin while meeting objectives for genetics, experimentation, natural production and ecological interactions.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

1.10 List of program "Performance Indicators", designated by "benefits" and "risks".

139

Indicators of Harvest Benefits

Indicator	Performance Standard	Indicator is Monitored
Spawner to spawner survival of hatchery fish	Expand harvest opportunities for treaty Tribal and sport fisheries inside and outside of the Yakima River Basin while meeting objectives for genetics, experimentation, natural production and ecological interactions, and Determine the feasibility of re-establishing a sustainable, naturally spawning coho population in the Yakima Basin with sufficient productivity to sustain a meaningful in-basin fishery in most years.	Y
Contribution of hatchery fish to target fisheries	Expand harvest opportunities for treaty Tribal and sport fisheries inside and outside of the Yakima River Basin while meeting objectives for genetics, experimentation, natural production and ecological interactions, and Determine the feasibility of re-establishing a sustainable, naturally spawning coho population in the Yakima Basin with sufficient productivity to sustain a meaningful in-basin fishery in most years.	Y
Angler success (hatchery fish per angler day) in target recreational fisheries	Expand harvest opportunities for treaty Tribal and sport fisheries inside and outside of the Yakima River Basin while meeting objectives for genetics, experimentation, natural production and ecological interactions, and Determine the feasibility of re-establishing a sustainable, naturally spawning coho population in the Yakima Basin with sufficient productivity to sustain a meaningful in-basin fishery in most years.	Y
Contribution of hatchery fish to cultural needs	Expand harvest opportunities for treaty Tribal and sport fisheries inside and outside of the Yakima River Basin while meeting objectives for genetics, experimentation, natural production and ecological interactions, and Determine the feasibility of re-establishing a sustainable, naturally spawning coho population in the Yakima Basin with sufficient productivity to sustain a meaningful in-basin fishery in most years.	Y
Selective harvest success (expected benefits of mass marking)	nya	nya

Indicators of Conservation Benefits

141

Indicator	Performance Standard	Indicator is Monitored
Genetic and life history diversity (over time)	Establish a Yakima River coho stock with heritable life history traits adapted to the Yakima River Basin, and Optimize production of naturalized populations of coho with respect to abundance and distribution.	Establish a Yakima River coho stock with heritable life history traits adapted to the Yakima River Basin, and Optimize production of naturalized populations of coho with respect to abundance and distribution.
Spawner to spawner reproductive success of hatchery fish	Optimize production of naturalized populations of coho with respect to abundance and distribution.	Y
Reproductive success of the receiving (supplemented) naturally spawning population	Optimize production of naturalized populations of coho with respect to abundance and distribution.	Y
Contribution to the abundance of the naturally spawning population	Optimize production of naturalized populations of coho with respect to abundance and distribution.	Y
Time and location of spawning	Optimize production of naturalized populations of coho with respect to abundance and distribution.	Y
Contribution to ecosystem function (e.g. through nutrient enhancement, food web effects, etc.)	nya	nya

Indicators of Harvest Risks

140.

Indicator	Performance Standard	Indicator is Monitored
Harvest impacts on co-mingled stocks	unk	unk
Bias in run size estimation of natural stocks due to masking effect	unk	unk
Lack of harvest access (under harvest due e.g. to co-mingling with weaker stocks)	unk	unk

Indicators of Conservation Risks

142.

Indicator	Performance Standard	Indicator is Monitored
Unintended contribution of hatchery fish to natural spawning (through straying)	Minimize adverse impacts of coho reintroduction on Non-taxa Target of Concern (NTTOC).	Y
Loss of genetic and life history diversity	Establish a Yakima River coho stock with heritable life history traits adapted to the Yakima River Basin, and Optimize production of naturalized populations of coho with respect to abundance and distribution.	Y
Loss of reproductive success	Optimize production of naturalized populations of coho with respect to abundance and distribution..	Y
Ecological interactions through competition with natural stocks (by life stage)	Minimize adverse impacts of coho reintroduction on Non-taxa Target of Concern (NTTOC).	Y
Ecological interactions through predation on natural stocks (by life stage)	Minimize adverse impacts of coho reintroduction on Non-taxa Target of Concern (NTTOC).	Y
Adverse effects of hatchery operations and facilities on fish migration Disease transfers	nya	nya

The following plans and methods are proposed to collect data for each Performance Indicator: Plans and methods are generally setforth in the Yakima/Klickitat Fisheries Project relative to colecting data that is responsive to monitoring and evaluating program performance standards/ indicators.

Specific program performance objectives as stated in the Planning Status Report (PSR) for the YKFP.

text from Yakima River Coho HGMP:

-Estimate annual life stage survival rates

- Egg-to-smolt: derived from adult counts, known fecundity rate and estimated smolt count past CJMF.

- Smolt-to-smolt (natural and hatchery): derived from PIT data analysis at CJMF and the lower Columbia mainstem dams.

144. - Smolt-to-adult (natural and hatchery): derived from, 1) PIT tag data and 2) estimated smolt divided into the Prosser adult counts.

-Temporal and spatial spawning distribution: Radio telemetry study and selected foot surveys.

-Hatchery Experimental Design (location, release time, and stock): PIT tag and CWT data analysis from the eight treatment groups.

-Smolt Production: Monitored annually at CJMF.

-Adult Returns: Monitored annually at Prosser, Cowiche and Roza dams.

-Genetic monitoring of reverse domestication: Develop and implement a genetics monitoring plan.

-Predation on other species (NTTOC): Monitored through the YKFP indirect and direct predation studies.

-Other potential ecological interactions: Monitored through snorkel surveys in the upper Yakima and Naches rivers.

The program contributes to information gain in the following way(s): Hatchery program contributes to research to improve performance and cost effectiveness
143. New information affects change to the hatchery program through a structured adaptive decision making process
Hatchery program participates in basin wide-coordinated research efforts
Hatchery program actively contributes to public education

Comments:

Program performance indicators are centered on the NPPCs definition of supplementation developed by the Regional Assessment of Supplementation Programs (RASP): "Supplementation is the use of artificial propagation in an attempt to maintain or increase natural production while maintaining the long term fitness of the target population, and keeping the ecological and genetic impacts on nontarget populations within specified biological limits" (RASP 1992).

Specific program performance objectives as stated in the Planning Status Report (PSR) for the YKFP.

Natural Production

1) Optimize natural production with respect to abundance and distribution.

2) Use supplementation as described by RASP (1991) (i.e., to increase natural production and increase harvest opportunities, while keeping genetic and ecological impacts within acceptable limits) to provide scientific benefits to the region.

Ecological Interactions

1)Keep adverse impacts of program supplementation on non-target taxa of concern (NTTOC) within prescribed limits.

2)Limit losses of wild and hatchery smolts to native and exotic predators to levels that do not significantly limit the scope for increase in natural production.

Genetic

1)Minimize genetic risks as described by Busack and Currens (1995) (extinction, loss of within-population variability, loss of between-population variability, and domestication selection) to program stocks.

Harvest

1)Increase harvest opportunities for all fishers consistent with the requirements of genetic, natural production, and experimentation objectives.

Experimentation

1)Use supplementation as described by RASP (1991) (i.e., to increase natural production and increase harvest opportunities, while keeping genetic and ecological impacts within acceptable limits) to provide scientific benefits to the region.

List of Performance Indicators designated by "benefits" and "risks"

Benefits to coho

-Accumulation of life history information: egg-to-smolt, smolt-to-smolt and smolt-to-adult survival rates; temporal and spatial spawning distribution; growth rates; size at smolting; gross juvenile summer spatial distribution.

-Differential survival differences between smolt releases made in the Naches vs upper Yakima subbasins; an in-basin vs out-of-basin stock; and an early vs a late smolt release date.

-Monitoring the long-term trend of smolt outmigrants past CJMF and adult up migrants past Prosser, Cowiche and Roza dams.

-Genetic monitoring of reverse domestication, as the program utilizes naturalized Yakima broodstock in a higher proportion through time. How does life stage survival rates change? What phenotypic changes occur through time to the Yakima population has natural production increases and as the percent of Yakima NOR adults are used for broodstock

Risks to other species

-Predation on other species (NTTOC) by program fish as indicated by stomach content analyses.

-Other potential ecological interactions as indicated by residualism, distribution, and habitat surveys.

Program performance indicators are centered on the NPPCs definition of supplementation developed by the Regional Assessment of Supplementation Programs (RASP): "Supplementation is the use of artificial propagation in an attempt to maintain or increase natural production while maintaining the long term fitness of the target population, and keeping the ecological and genetic impacts on nontarget populations within specified biological limits" (RASP 1992).

Specific program performance objectives as stated in the Planning Status Report (PSR) for the YKFP.

Natural Production

1) Optimize natural production with respect to abundance and distribution.

2) Use supplementation as described by RASP (1991) (i.e., to increase natural production and increase harvest opportunities, while keeping genetic and ecological impacts within acceptable limits) to provide scientific benefits to the region.

Ecological Interactions

1)Keep adverse impacts of program supplementation on non-target taxa of concern (NTTOC) within prescribed limits.

2)Limit losses of wild and hatchery smolts to native and exotic predators to levels that do not significantly limit the scope for increase in natural production.

Genetic

1)Minimize genetic risks as described by Busack and Currens (1995) (extinction, loss of within-population variability, loss of between-population variability, and domestication selection) to program stocks.

Harvest

1)Increase harvest opportunities for all fishers consistent with the requirements of genetic, natural production, and experimentation objectives.

Experimentation

1)Use supplementation as described by RASP (1991) (i.e., to increase natural production and increase harvest opportunities, while keeping genetic and ecological impacts within acceptable limits) to provide scientific benefits to the region.

Program performance indicators are centered on the NPPCs definition of supplementation developed by the Regional Assessment of Supplementation Programs (RASP): "Supplementation is the use of artificial propagation in an attempt to maintain or increase natural production while maintaining the long term fitness of the target population, and keeping the ecological and genetic impacts on nontarget populations within specified biological limits" (RASP 1992).

Specific program performance objectives as stated in the Planning Status Report (PSR) for the YKFP.

Natural Production

1) Optimize natural production with respect to abundance and distribution.

2) Use supplementation as described by RASP (1991) (i.e., to increase natural production and increase harvest opportunities, while keeping genetic and ecological impacts within acceptable limits) to provide scientific benefits to the region.

Ecological Interactions

1)Keep adverse impacts of program supplementation on non-target taxa of concern (NTTOC) within prescribed limits.

2)Limit losses of wild and hatchery smolts to native and exotic predators to levels that do not significantly limit the scope for increase in natural production.

Genetic

1)Minimize genetic risks as described by Busack and Currens (1995) (extinction, loss of within-population variability, loss of between-population variability, and domestication selection) to program stocks.

Harvest

1)Increase harvest opportunities for all fishers consistent with the requirements of genetic, natural production, and experimentation objectives.

Experimentation

1)Use supplementation as described by RASP (1991) (i.e., to increase natural production and increase harvest opportunities, while keeping genetic and ecological impacts within acceptable limits) to provide scientific benefits to the region.

Program performance indicators are centered on the NPPCs definition of supplementation developed by the Regional Assessment of Supplementation Programs (RASP): "Supplementation is the use of artificial propagation in an attempt to maintain or increase natural production while maintaining the long term fitness of the target population, and keeping the ecological and genetic impacts on nontarget populations within specified biological limits" (RASP 1992).

Specific program performance objectives as stated in the Planning Status Report (PSR) for the YKFP.

Natural Production

1) Optimize natural production with respect to abundance and distribution.

2) Use supplementation as described by RASP (1991) (i.e., to increase natural production and increase harvest opportunities, while keeping genetic and ecological impacts within acceptable limits) to provide scientific benefits to the region.

Ecological Interactions

1)Keep adverse impacts of program supplementation on non-target taxa of concern (NTTOC) within prescribed limits.

2)Limit losses of wild and hatchery smolts to native and exotic predators to levels that do not significantly limit the scope for increase in natural production.

Genetic

1)Minimize genetic risks as described by Busack and Currens (1995) (extinction, loss of within-population variability, loss of between-population variability, and domestication selection) to program stocks.

Harvest

1)Increase harvest opportunities for all fishers consistent with the requirements of genetic, natural production, and experimentation objectives.

Experimentation

1)Use supplementation as described by RASP (1991) (i.e., to increase natural production and increase harvest opportunities, while keeping genetic and ecological impacts within acceptable limits) to provide scientific benefits to the region.

nc
nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Yakima Klickitat Planning Status Report. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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

198. nya

Data source:

nds

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

Age Class	Maximum Number	Size (fish/lb)	Release Date	Location: Stream	Location: Release Point (RKm)	Location: Major Watershed	Location: Ecoprovince
Eggs	nya	nya	nya	nya	nya	nya	nya
Unfed Fry	nya	nya	nya	nya	nya	nya	nya
Fry	nya	nya	nya	nya	nya	nya	nya
Fingerling	nya	nya	nya	nya	nya	nya	nya
Yearling	500000	12-15	May 7 (Early Release) and May 28 (Late Release)	Easton Pond (Yakima R.), and Hatchery Slough (Chel3um Hatchery)	nya	Yakima	Columbia Plateau

Comments:

PROGRAM DESCRIPTION

Broodstock Capture:

Willard National Fish Hatchery (out-of- basin stock), and Prosser Dam, right bank steep-pass ladder (Yakima stock).

Broodstock Holding to Maturity:

Prosser Hatchery, (Yakima broodstock), and Willard National Fish Hatchery (out-of-basin broodstock).

Fish Spawning, Incubation, Rearing:

Spawning: Prosser Hatchery (Yakima broodstock), and Willard National Fish Hatchery (out-of-basin broodstock).

Incubation: Prosser Hatchery, (Yakima stock), and Willard National Fish Hatchery (out-of-basin stock).

Initial Rearing: Prosser Hatchery, (Yakima stock), and Willard National Fish Hatchery (out-of-basin stock).

Final Rearing and Acclimation: Yakima Basin and out-of-basin stocks - Yakima River: Easton D.O.T. Ponds and Hatchery Slough.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River, 07 October 2002.

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

33.

Return Year	Total Catch (all ages)	Natural Escapement		Hatchery Spawning	
		NoRs	HoRs	NoRs	HoRs
Goal	nya	nya	nya	nya	nya
1990	nya	nya	nya	nya	nya
1991	nya	nya	269	nya	nya
1992	nya	nya	190	nya	nya
1993	nya	nya	165	nya	nya
1994	nya	nya	560	nya	nya
1995	nya	nya	725	nya	nya
1996	nya	nya	1338	nya	nya
1997	nya	nya	1312	nya	nya
1998	nya	nya	4679	nya	nya
1999	nya	nya	3711	nya	196
2000	425	nya	5671	106	4
2001	54	nya	3133	80	411

Comments:

1. There was likely some NoR escapement from 1991 through 2000. However, HoR releases were only 100% marked beginning in brood year 1998, therefore enumeration of HoR and NoR escapement was only fully possible beginning in 2001.

2. Yakima River harvest in years other than 2000 and 2001 was likely at or near zero. However, these coho are also harvested in marine fisheries from Alaska south into Oregon and northern California, and in Columbia River fisheries from the mouth to the Hanford Reach. Fishery managers anticipate that a Yakima River fishery will develop when runs exceed 10,000 coho annually on a consistent basis.

Data source:

B. Bosch/YN, Prosser Count, Harvest, and Prosser Hatchery data files, 5/12/03.

Status and Goals of Stocks and Habitats

34.

Brood Year	NoRs		HoRs		Combined (HoRs + NoRs)	
	Smolt to Adult Survival(%)	Recruits per Spawner	Smolt to Adult Survival(%)	Recruits per Spawner	Smolt to Adult Survival(%)	Recruits per Spawner
Goal	nya	nya	nya	nya	nya	nya
1988	nya	nya	1.99	nya	0.046	nya
1989	nya	nya	0.15	nya	0.036	nya
1990	nya	nya	0.07	nya	0.034	nya
1991	nya	nya	0.05	nya	0.100	nya
1992	nya	nya	0.13	nya	0.088	nya
1993	nya	nya	0.09	nya	0.142	nya
1994	nya	nya	0.08	nya	0.136	nya
1995	nya	nya	0.21	nya	0.448	nya
1996	nya	nya	0.17	nya	0.259	nya
1997	nya	nya	0.14	nya	0.591	nya
1998	nya	nya	0.32	nya	0.527	nya
1999	nya	nya	0.15	nya	0.053	nya

Comments:

HoR SAR data from Annual Stock Assessment CWT data for Cascade Hatchery/Tanner Creek Stock released in the Yakima River.

1. Smolt-to-Adult survival % given is the smolt release to Prosser adult return rate for the aggregate (HoR and NoR) stock.

2. NoR recruit per spawner rates are only available beginning with the 1998 brood when all hatchery-origin releases were 100% marked. The data given are the estimated NoR adult and jack returns per total natural escapement for these brood years and should be considered preliminary- Bill Bosch, 5/12/03.

Data source:

Annual Stock Assessment Coded Wire Tag Program (ODFW), Annual Report 2001. Source of data/information: B. Bosch/YN, Prosser Count, Harvest, and Prosser Hatchery data files, 5/12/03.

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

7. The first year of operation for this hatchery was 1983 .

Comments:

LWS/Willard Yakima Coho Program was initiated in 1983.

Prosser Coho Program was initiated in 1997

Out basin stocks have been outplanted into the Yakima Subbasin since 1981. The use of locally adapted coho for the program was initiated in 1994.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

1.14 Expected duration of program.

148. The final year of the program is undetermined.

149. The program is expected to end when goals can be met by other means not requiring artificial production.

Comments:

Phase One, is scheduled to for completion in 2005, after which time the long-term the permanent hatchery program will be implemented based on YKFP policy decisions.

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

1.15 Watersheds targeted by program.

1. Yakima River Subbasin/Columbia Plateau Province

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

The hatchery program is a part of a strategy to meet conservation and/or harvest goals for the target stock. The tables below indicate what the short- and long-term goals are for the stock in terms of stock status (biological significance and viability), habitat and harvest. The letters in the table indicate High, Medium, or Low levels for the respective attributes. Changes in these levels from current status indicate expected outcomes for the hatchery program and other strategies (including habitat protection and restoration).

18.

	Biological Significance	Viability	Habitat
Current Status	L	M	L
Short-term Goal	L	M	L
Long-term Goal	M	H	M

This table shows current status and goals for harvest opportunity. **H** implies harvest opportunity every year, **M** opportunity most years, **L** some years, and **N** no opportunity.

19. 20. 21. 22. 23.

Fishery type		Location of Fishery				
		Marine	L. Columbia	Zone 6	U. Columbia	Subbasin
Commercial	Current Status	H	H	H	nya	N
	Short-term Goal	H	H	H	nya	N
	Long-term Goal	H	H	H	nya	M
Ceremonial	Current Status	nya	nya	H	nya	H
	Short-term Goal	nya	nya	H	nya	H
	Long-term Goal	nya	nya	H	nya	H
Subsistence	Current Status	nya	nya	H	nya	H
	Short-term Goal	nya	nya	H	nya	H
	Long-term Goal	nya	nya	H	nya	H
Recreational	Current Status	H	H	H	H	H
	Short-term Goal	H	H	H	H	H
	Long-term Goal	H	H	H	H	H
Catch and Release	Current Status	dna	dna	dna	dna	dna
	Short-term Goal	dna	dna	dna	dna	dna
	Long-term Goal	dna	dna	dna	dna	dna

Opportunities to reduce risk and/or increase survival of the target population or increase program efficiency include:

HGMP:

- NOAA Fisheries Program Designation: Yakima River Coho
- (Alternative) Do not attempt reintroduction.
- (Alternative) Plant fry. Scatter plant coho fry into tributaries throughout the Yakima.
- (Alternative) Release adult coho salmon into tributaries throughout the Yakima system.
- (Alternative) Develop new upper basin hatchery/rearing facilities and increase the release of acclimated, locally-adapted smolts.
- (Alternative) Collect local brood in-basin, but spawn and rear these fish out-of-basin. Bring the smolts back for acclimation and release from upriver sites.
- (Reform or Investment) Collect local brood at Roza and Cowiche, upgrading the Cowiche collection facility as necessary.
- (Reform or Investment) Build a full facility and smaller satellite facilities in the upper Yakima Basin as necessary.

APRE:

- APRE Form Program Designation: Yakima-Upper Yakima Coho
- Sufficient broodstock should be collected to maintain an effective population size of 1000 fish per generation.
- 10% or more of the broodstock should be derived from wild fish each year.
- If the wild population has 150 fish or more, collection of wild broodstock should be limited to 30% of the population.
- Hatchery intake screening for the incubation water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.
- Juvenile rearing density and loading guidelines used at the facility should be based on life-stage specific survival studies conducted on-site.
- The program should use a diet and growth regime that mimics natural seasonal growth patterns.
- Fish produced should be qualitatively similar to natural fish in growth rate.
- Volitional releases during natural out-migration timing should be practiced.
- Fish should be released at an optimum time and size that has been determined by a site-specific survival study.
- The facility should operate within the limitations established in National Pollution Discharge Elimination System permit.
- Adults from this program should not make up more than 30% of the natural spawning escapement (for the species/race) in the subbasin.

Comments:

nc
nc
nc
nc
nc
nc

Data source:

nds
nds
nds
nds
nds
nds

Section 2: Program Effects on ESA-Listed Salmonid Populations

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

150 The program has the following permits or authorizations: nya.

Comments:

nc

Data source:

nds

2.2.1 Descriptions, status and projected take actions and levels for ESA-listed natural populations in the target area.

Yakima summer steelhead (mid-Columbia ESU)

145 Bull trout (Columbia River Distinct Population Segment)

15 nya

92 Listed stocks may be directly affected by nya.

The following ESA listed natural salmonid populations occur in the subbasin where the program fish are released:

ESA listed stock	Viability	Habitat
Upper Yakima Steelhead-Natural	L	L
Satus Steelhead-Natural	L	L
Toppenish Steelhead-Natural	L	L
Naches Steelhead-Natural	L	L
Bull Trout- Natural	nya	nya
H, M and L refer to high, medium and low ratings, low implying critical and high healthy.		

Comments:

nc
nc
nc
nc

Data source:

http://nwr.noaa.gov/ http://endangered.fws.gov/
nds
nds
nc

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

nya

Most recent available spawning escapement estimates are shown in the table below:

Upper Yakima Steelhead-Natural

Return Year	Total Catch (all ages)	Natural Escapement		Hatchery Spawning	
		NoRs	HoRs	NoRs	HoRs
Goal	nya	nya	nya	nya	nya
1990	28	782	nya	nya	nya
1991	148	2095	nya	nya	nya
1992	72	1089	nya	nya	nya
1993	3	551	nya	nya	nya
1994	0	925	nya	nya	nya
1995	20	485	nya	nya	nya
1996	0	956	nya	nya	nya
1997	50	1019	nya	nya	nya
1998	12	1058	nya	nya	nya
1999	0	1380	nya	nya	nya
2000	8	2834	nya	nya	nya
2001	11	4514	nya	nya	nya

Satus Steelhead-Natural

Return Year	Total Catch (all ages)	Natural Escapement		Hatchery Spawning	
		NoRs	HoRs	NoRs	HoRs
Goal	nya	nya	nya	nya	nya
1990	nya	nya	nya	nya	nya
1991	nya	nya	nya	nya	nya
1992	nya	nya	nya	nya	nya
1993	nya	nya	nya	nya	nya
1994	nya	nya	nya	nya	nya
1995	nya	nya	nya	nya	nya
1996	nya	nya	nya	nya	nya
1997	nya	nya	nya	nya	nya
1998	nya	nya	nya	nya	nya
1999	nya	nya	nya	nya	nya
2000	nya	nya	nya	nya	nya
2001	nya	nya	nya	nya	nya

Toppenish Steelhead-Natural

Return Year	Total Catch (all ages)	Natural Escapement		Hatchery Spawning	
		NoRs	HoRs	NoRs	HoRs
Goal	nya	nya	nya	nya	nya
1990	nya	nya	nya	nya	nya
1991	nya	nya	nya	nya	nya
1992	nya	nya	nya	nya	nya
1993	nya	nya	nya	nya	nya
1994	nya	nya	nya	nya	nya
1995	nya	nya	nya	nya	nya
1996	nya	nya	nya	nya	nya
1997	nya	nya	nya	nya	nya
1998	nya	nya	nya	nya	nya
1999	nya	nya	nya	nya	nya
2000	nya	nya	nya	nya	nya
2001	nya	nya	nya	nya	nya

Naches Steelhead-Natural

Return Year	Total Catch (all ages)	Natural Escapement		Hatchery Spawning	
		NoRs	HoRs	NoRs	HoRs
Goal	nya	nya	nya	nya	nya
1990	nya	nya	nya	nya	nya
1991	nya	nya	nya	nya	nya
1992	nya	nya	nya	nya	nya
1993	nya	nya	nya	nya	nya
1994	nya	nya	nya	nya	nya
1995	nya	nya	nya	nya	nya
1996	nya	nya	nya	nya	nya
1997	nya	nya	nya	nya	nya
1998	nya	nya	nya	nya	nya
1999	nya	nya	nya	nya	nya
2000	nya	nya	nya	nya	nya
2001	nya	nya	nya	nya	nya

Bull Trout- Natural

Return Year	Total Catch (all ages)	Natural Escapement		Hatchery Spawning	
		NoRs	HoRs	NoRs	HoRs
Goal	nya	nya	nya	nya	nya
1990	nya	nya	nya	nya	nya
1991	nya	nya	nya	nya	nya
1992	nya	nya	nya	nya	nya
1993	nya	nya	nya	nya	nya
1994	nya	nya	nya	nya	nya
1995	nya	nya	nya	nya	nya
1996	nya	nya	nya	nya	nya
1997	nya	nya	nya	nya	nya
1998	nya	nya	nya	nya	nya
1999	nya	nya	nya	nya	nya
2000	nya	nya	nya	nya	nya
2001	nya	nya	nya	nya	nya

Comments:

nc
nc
1. There was likely some NoR escapement from 1991 through 2000. However, HoR releases were only 100% marked beginning in brood year 1998, therefore enumeration of HoR and NoR escapement was only fully possible beginning in 2001.

2. Yakima River harvest in years other than 2000 and 2001 was likely at or near zero. However, these coho are also harvested in marine fisheries from Alaska south into Oregon and northern California, and in Columbia River fisheries from the mouth to the Hanford Reach. Fishery managers anticipate that a Yakima River fishery will develop when runs exceed 10,000 coho annually on a consistent basis.

Data source:

nds
nds
http://nwr.noaa.gov/ http://endangered.fws.gov/

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.

Upper Yakima Spring Chinook

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

	Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/ mark / tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Naches Spring Chinook-Natural

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

	Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/ mark / tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

American River Spring Chinook-Natural

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

	Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/ mark / tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Yakima Fall Chinook

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Marion Drain Fall Chinook

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Naches Coho

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Upper Yakima Coho

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Upper Yakima Steelhead-Natural

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Satus Steelhead-Natural

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Toppenish Steelhead-Natural

152

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Naches Steelhead-Natural

152

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Yakima Summer Chinook-Natural

152

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Bull Trout- Natural

152

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Upper Yakima River Rainbow Trout-Natural

152

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	

Other take (specify) (h)	nya	nya	nya	nya

Naches Rainbow Trout-Natural

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Lake Rainbow Trout-Hatchery

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Lakes Brown Trout-Hatchery

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Cutthroat-Natural

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Lake Cutthroat-Hatchery

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Kokanee-Hatchery

152

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

	Annual Take of Listed Fish by life Stage (number of fish)			
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Kokanee-Natural

152

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

153

	Annual Take of Listed Fish by life Stage (number of fish)			
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Comments:

nc
nc
nc

Data source:

nds
nds
nds

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.

155 nya

Comments:

nc

Data source:

nds

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

156

Document Title	Type
The Columbia River Fish Management Plan	MP
US v Washington	CO
Yakama Nation and US Bureau Reclamation Prosser Hatchery Agreement	MOU
Yakama Nation and US Fish & Wildlife Service Fish Health Agreement	MOU

Comments:

Information in this section includes status of species and potential impacts in the Yakima Basin.

Since the 1990s, various entities in the Pacific Northwest have renewed the region?s focus on reintroduction of coho to the mid-Columbia.

The four Columbia River Treaty Tribes (Nez Perce, Umatilla, Warm Springs, and Yakama) identified coho reintroduction in the mid-Columbia as a priority in the Wy-Kan-Ush-Mi-Wa-Kish-Wit document, commonly referred to as the Tribal Restoration Plan (TRP) (CRITFC 1995). It is a comprehensive plan put forward by the Tribes to restore the Columbia River fisheries. This project is the initial phase necessary to determine the feasibility of implementing that long-term vision in the mid-Columbia region.

In 1996, the Northwest Power Planning Council (NPPC) recommended the tribal mid-Columbia reintroduction project for funding by BPA, which has responsibilities under the Northwest Electric Power Planning and Conservation Act of 1980 to protect, mitigate, and enhance fish and wildlife that have been affected by the construction and operation of the Federal Columbia River Power System. It was identified as one of fifteen high-priority projects for the Columbia River basin, and was incorporated into the NPPC?s Fish and Wildlife Program (program measures 7.1H, 7.4A, 7.4F, and 7.4O). The project will be subject to a Step-Two Review by the Council once the feasibility phase is completed and the time is ripe to consider full implementation of the long-term vision.

The release of coho from lower Columbia hatcheries into mid-Columbia tributaries is also recognized in the Columbia River Fish Management Plan, a court-mandated plan under the jurisdiction of U.S. v. Oregon, involving Federal, state and tribal fish managers in the Columbia basin (CTWSR et al. 1988). While this project is not mandated under that court order, fish produced under that plan supply the project.

The draft Yakima Coho, Project Status Review (YKFP, 2001) prepared by the YKFP, Monitoring Implementation Planning Team (MIPT) provides direction for objectives and strategies for Phase One of the program.

The U.S. District Court ruled on March 22, 1974 that the Yakama Nation and Washington Department of Fish and Wildlife co-manage fish resources in Washington state. This decision is commonly referred to as the Boldt Decision.

A Memorandum of Understanding, dated 12/27/93, stipulates that the Wenatchee National Forest (WNF) and the YN will cooperatively manage fish resources on the Wenatchee National Forest.

The YN has a Memorandum of Understanding with the BOR, which stipulates responsibilities between the two parties pertaining to the Prosser Hatchery facility.

The YN has a subcontract with the USFWS to monitor fish health at the main hatchery facility and satellite acclimation facilities.

Mitchell Act funds are used for in-basin acclimation of out-of-basin fish transported to the Yakima Basin.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

3.3 Relationship to harvest objectives.

The stated YKFP harvest objective is to, "Expand harvest opportunities for treaty Indian and sport fisheries inside and outside of the Yakima River Basin while meeting objectives for genetics, experimentation, natural production and ecological interactions."

The Yakama Nation has set an in basin coho subsistence fishery since mid 1990?s, however, harvest has been virtually zero. This is largely due to the commercial Zone 6 fishery, which overlaps in time to a large extent with the Yakima fishery season.

157

In 1998 WDFW instituted an in-basin sport harvest in the Yakima basin. There is an unofficial harvest maximum of 10% of the adult escapement to the river mouth. The two agencies cooperate in setting the geographic boundaries and fishing season. The WDFW is also providing bio-sample data from fish caught in the fishery to the YKFP monitoring and evaluation program.

Comments:

nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

3.4 Relationship to habitat protection and recovery strategies.

YN, state, federal, local (irrigation districts)entities are working together to improve habitat and water resources in the Yakima Subbasin, by overcoming major inhibitig factors to the recovery of coho salmon.

Major inhibiting factors to coho production are:

1)Sublethal to lethal water temperatures typically by June below Prosser Dam (RM 47).

2)Low flow conditions (especially in poor water years) between Prosser Dam and the Chandler power plant outfall.

3)Predation by birds (especially in poor water years), and both native and exotic piscivorous fish (especially smallmouth bass).

4)Loss of structurally complex rearing habitat.

5)Excessive sediments from irrigation drains (though this is being slowly addressed in recent years) in major spawning areas.

6)Smolt mortality associated with predation in the vicinity of bypass outfalls at Wapato, Sunnyside and Prosser Dams, and a number of smaller Yakima Basin dams (e.g., Marion Drain re-use diversion, Columbia and Richland Ditches at Horn Rapids Dam).

7)Adult mortality associated with mainstem Columbia dams.

8)Smolt mortalities associated with traversing mainstem Columbia dams and impoundments.

The following discussion on the historic decline of coho stocks in the Yakima Basin is an excerpt taken from the draft Yakima Coho, Project Status Report (1999).

The decline of coho salmon in the Yakima Basin occurred in two major phases. The first phase, covering the years 1850 through roughly 1900, saw Yakima runs (of coho and all other anadromous salmonids) decline approximately 90% from historical values (Davidson 1953; Tuck 1995; Lichatowich 1996). In the second phase, covering the years 1900 through 1980, a remnant coho population slowly dwindled to extinction. The major cause of decline in the catastrophic first phase was clearly diversion of water for irrigation (Tuck 1995; Lichatowich 1996).

In his thesis on the impacts of irrigation development on anadromous fish in the Yakima Basin, Tuck (1995) documents the fact that significant irrigation withdrawals began in the 1870?s and accelerated dramatically after the railroad reached Yakima in 1884. By the mid-1890?s, most smaller tributaries were ?completely appropriated? (viz., were dried up by late spring) by a host of irrigation diversions. Tuck also documents the ?complete appropriation? of the mainstem Yakima itself by 1905. Tuck (1995) and Lichatowich (1996) point out that peak diversion rates in excess of 90% occurred throughout the period of smolt outmigration. The single most destructive aspect of early irrigation development was the diversion of literally millions of smolts and fry into irrigation ditches and ultimately into fields and orchards. Except for one small diversion on the Naches River, which was screened in 1928, none of the hundreds of diversions in the Yakima Basin were screened until the Puttlic Works Administration program of 1934 ? 1940 (Tuck, 1995). Therefore, the probability that a smolt would survive from the upper Yakima to the Columbia was extremely small, and the bulk of the phase 1 decline can be attributed primarily to smolt entrainment in irrigation diversions. Factors such as mainstem harvest, Columbia hydroelectric projects and widespread alteration of the floodplain and river channel would later become important factors contributing to the decline of Yakima coho.

Irrigation dams and diversions continued to play a dominant role in the second phase of coho decline until 1940, when most of the major screening facilities were completed. Although diversions continued to impact coho after 1940, primarily through predation at bypass outfalls and entrainment attributable to poor design and/or mechanical failure (Fiest et al. 1991; WDF 1967), other factors became relatively more important. These factors include:

158.

? Construction of major storage reservoirs which blocked fish access to hundreds of miles of habitat and allowed flows in most of the basin to be regulated for irrigation.

? Structural changes to the river channel, floodplain and riparian corridor associated with agricultural and residential development that eliminated structurally complex rearing habitat for juveniles.

? Maximum water temperatures in the lower hundred miles of the Yakima mainstem that reached or exceeded lethal levels.

? Adult and juvenile mortalities associated with the Columbia River hydropower system.

? Decreases in the abundance of prey organisms for juvenile salmonids attributable to the regulated hydrograph.

? Intensive mixed-stock coho harvests beginning in the 1960?s.

The causes of the loss of rearing habitat and increased water temperatures are very much interrelated. They include:

? Elimination of riparian vegetation.

? The filling in of side channels and wetlands.

? Extensive channelization of the mainstem Yakima and Naches in formerly anatomosing reaches and the confinement of many other reaches to a single channel by dikes and roads.

? The elimination of regular spring floods, which charged wetlands and shallow aquifers with the cool water that provided summer base flows.

? The general reduction of groundwater input to base flows attributable to anthropogenic disruptions of shallow aquifers.

The reduced frequency of spring floods attributable to the construction of storage reservoirs and the radical narrowing of the floodplain attributable to extensive channelization and diking also reduced the productivity of coho populations. An important hydrologic function of floodplains is to reduce the amplitude of flood events by spreading the water laterally and into shallow aquifers. When this is impossible, as it is in much of the Yakima Basin, floods become destructive, displacing juveniles downstream and scouring redds. In addition, a confined river is unable to sweep organic materials and invertebrates from the floodplain, and is thus unable to increase the food supply for juvenile salmonids and their prey.

Between 1941 and 1958, the remnant upper Yakima coho population was severely impacted by operations at Roza Dam. Until a new facility was installed in 1889 , the ladder at Roza Dam was dewatered whenever the pool was lowered at the end of the irrigation season. From 1941 through 1958, the pool was lowered, on average, from October 19 through March 17 (data from the BOR Yakima Project Office?s online HYDROMET system). Therefore, based on historical coho passage times at Roza, the fish ladder was inaccessible to roughly 70% of the run. A power plant was added to Roza Canal in 1959, providing an economic incentive to keep water flowing through the canal (and the ladder) during as much of the year as possible. After installation of the power plant, the canal and ladder remained flowing continuously except during periods of severe icing. From 1959 through 1980, access was denied to only about 30% of the run.

Native Yakima coho probably went extinct around 1980. Pre-terminal returns of Yakima coho (McNary Dam coho counts minus the sum of Priest Rapids and Ice Harbor counts) declined sharply about 1980, and no coho adults were observed at Prosser Dam in 1984 . The decade of the 1970s saw a number of extreme drought years (1973, 1977, and 1979), which, in concert with lower Columbia River fishing pressure and long-standing habitat problems, apparently pushed Yakima coho over the brink. The Mitchell Act provided funding for hatcheries that supported a mixed-stock coho fishery. Harvest rates geared to hatchery fish sometimes exceeded 90% on returning coho during the 1960s and 1970s (TAC 1997), resulting in over harvest of wild coho stocks in the middle Columbia and Snake Rivers (NMFS 1991).

Comments:

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

3.5 Ecological interactions.

The following species co-occur to a significant degree with the program fish in either freshwater or early marine life stages.

159.

- Steelhead
- Chum
- Sockeye
- Coho
- Chinook
- Bull Trout

Comments:

text from Yakima River Coho HGMP:

Describe salmonid and non-salmonid fishes or other species that could:

(1) negatively impact program

Pikeminnows, smallmouth bass, and avian predation have a yet non-quantified impact on coho hatchery smolts. Mergansers have been identified as a problem at certain acclimation sites. Gulls, especially during low flow periods are a known predator at the fish bypass outfall sites (i.e. Chandler) for all salmonid smolts. These impacts by both piscivorous fishes and birds are being investigated through two YKFP funded predation studies- one directed toward fish and the other towards birds.

(2) be negatively impacted by program

No significant impacts to other salmonid species have been demonstrated. A two-year coho smolt predation study was initiated in 1998 to investigate the potential predation of hatchery coho smolts on newly emergent spring chinook fry in the upper Yakima (Dunningan 1999). Impacts of these hatchery coho smolt releases were concluded as having no significant impact on the wild spring chinook population.

(3) positively impact program

There is no definitive information concerning this issue, however, this question is being addressed through the YKFP indirect predation study.

(4) be positively impacted by program

Though not rigorously investigated, the addition of carcasses to tributaries and side channels, especially in the upriver reaches, is a benefit for nutrient enrichment to the stream itself, as well as, to terrestrial animals, which feed on the carcasses.

Data source:

nds

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.

The following statements describe the adult holding water source:

12

- The water source is gravity flow.
- The water source is pumped.
- The water source is specific-pathogen free.
- Water is available from multiple sources.
- Water is from the natal stream for the cultured stock.
- The water used results in natural water temperature profiles that provide optimum maturation and gamete development.
- The water used meets or exceeds the recommended Integrated Hatchery Operations Team (IHOT) water quality guidelines for temperature.
- The water used meets or exceeds the recommended Integrated Hatchery Operations Team (IHOT) water quality guidelines for ammonia, carbon dioxide, chlorine, pH, copper, dissolved oxygen, hydrogen sulfide, dissolved nitrogen, iron, and zinc
- The water supply is protected by flow alarms at the intake(s).
- The water supply is protected by flow and/or pond level alarms at the holding pond(s).
- The water supply is protected by back-up power generation.
- Hatchery intake screening complies with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility guidelines.

The following statements describe the incubation water source:

13

- The water source is gravity flow.
- The water source is pumped.
- The water source is pathogen-free.
- The water source is specific-pathogen free.
- The water used provides natural water temperature profiles that results in hatching/emergence timing similar to that of the naturally produced stock.
- Incubation water can be heated or chilled to approximate natural water temperature profiles.
- The water used meets or exceeds the recommended Integrated Hatchery Operations Team (IHOT) water quality guidelines for temperature.
- The water supply is protected by flow alarms at the intake(s).
- The water supply is protected by flow and/or pond level alarms at the holding pond(s).

The following statements describe the rearing water source:

14

- The water source is gravity flow.
- The water source is specific-pathogen free.
- The water source is accessible to anadromous fish.
- Water is from the natal stream for the cultured stock.
- The water used provides natural water temperature profiles that results in hatching/emergence timing similar to that of the naturally produced stock.
- Rearing water has a chemical profile significantly different from natural stream conditions to provide adequate imprinting of hatchery fish and minimize the attraction of naturally produced fish into the hatchery.
- The hatchery operates to allow all migrating species of all ages to by-pass or pass through hatchery related structures.
- Adequate flows are maintained to provide unimpeded passage of adults and juveniles in the by-pass reach created by hatchery water withdrawals.
- The water used meets or exceeds the recommended Integrated Hatchery Operations Team (IHOT) water quality guidelines for temperature.
- The water used meets or exceeds the recommended Integrated Hatchery Operations Team (IHOT) water quality guidelines for ammonia, carbon dioxide, chlorine, pH, copper, dissolved oxygen, hydrogen sulfide, dissolved nitrogen, iron, and zinc.
- The water supply is protected by flow alarms at the intake(s).
- The water supply is protected by flow and/or pond level alarms at the holding pond(s)
- The water supply is protected by back-up power generation.
- Hatchery intake screening complies with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility guidelines.

Comments:

Above information applies to Prosser Hatchery.

Derive additional information from LWS/Willard NFH Complex manager.

text from Yakima River Coho HGMP:

The Yakima River (Chandler Canal) and two wells supply the water needed to operate the Prosser Hatchery. The Yakima River and Naches River acclimation sites are supplied by their respective river sources.
Above information applies to Prosser Hatchery.

Derive additional information from LWS/Willard NFH Complex manager.
Above information applies to Prosser Hatchery.

Derive additional information from LWS/Willard NFH Complex manager.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

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.

15 The production from this facility falls below the minimum production requirement for an NPDES permit, but the facility operates in compliance with state or federal regulations for discharge .

Comments:

Currently the Prosser program falls below limits, but projected program will require NPDES, and Application process for NPDES permit is in progress.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.

Section 5. Facilities

5.1 Broodstock collection facilities (or methods).

Brookstock for this program is collected:

16

- by volitional return to adult capture pond.
- at another facility.
- by methods described below. ** NO STATEMENT PROVIDED FOR THIS CHOICE **

188

Ponds (number)	Pond Type	Volume (cu. ft)	Length (ft.)	Width (ft.)	Depth (ft.)	Available Flow (gpm)
1	Vinyl line Raceway	22000	150	50	4	1100
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya

Comments:

Above information applies to Prosser Hatchery: Yakima broodstock for Prosser Hatchery are collected at Prosser Dam, right bank fishway steep-pass ladder.

Derive additional information from LWS/Willard NFH Complex manager.

Above information applies to Prosser Hatchery.

Derive additional information from Little White Salmon/Willard NFH Complex

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

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

99 IHOT guidelines for transportation are followed.

187

Equipment Type	Capacity (gallons)	Supplemental Oxygen (y/n)	Temperature Control (y/n)	Normal Transit Time (minutes)	Chemical(s) Used	Dosage (ppm)
Adult Transfer Tanker Truck	700	Y	N	5	Light dose MS	nya
Juvenile Transfer Tanker Truck	2500	Y	N	150	nya	nya
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya

Comments:

Adults are captured at steep pass at Prosser Dam. Trucked ½ mile to Prosser Hatchery and held in large holding ponds. They are treated with formalin and checked weekly for ripeness. When ripe they are spawned at Prosser Hatchery.
Above information applies to Prosser Hatchery

Derive LWS/Willard NFH information from complex manager.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

5.3 Broodstock holding and spawning facilities.

Spawning for this program takes place:

16

- in a covered facility.
- at a remote location.** NO STATEMENT PROVIDED FOR THIS CHOICE *** NO STATEMENT PROVIDED FOR THIS CHOICE **

94 Integrated Hatchery Operations Team (IHOT) adult holding guidelines followed for adult holding , density , water quality , alarm systems and predator control measures to provide the necessary security for the broodstock.

188

Ponds (number)	Pond Type	Volume (cu. ft)	Length (ft.)	Width (ft.)	Depth (ft.)	Available Flow (gpm)
1	Vinyl line Raceway	22000	150	50	4	1100
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya

Comments:

Above information applies to Prosser Hatchery: Yakima broodstock for Prosser Hatchery are collected at Prosser Dam, right bank fishway steep-pass ladder.

Derive additional information from LWS/Willard NFH Complex manager.

text from Yakima River Coho HGMP:

Coho broodstock are held and spawned at the Prosser Hatchery. One plastic lined pond (150 ft by 150 ft) is used to hold the broodstock. All adults are held in the pond until ready to be spawned. Fish are spawned in the spawning shed. The unfertilized gametes are taken to the incubation room where eggs are fertilized.
Above information applies to Prosser Hatchery.

Derive additional information from Little White Salmon/Willard NFH Complex

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

5.4 Incubation facilities.

189

Incubator Type	Units (number)	Flow (gpm)	Volume (cu.ft.)	Loading-Eyeing (eggs/unit)	Loading-Hatching (eggs/unit)
Deep Trough with perforated plates (10 cells per trough)- Prosser Hatchery	5	5	nya	60000 per cell	nya
Vertical Stack (16 trays/stack)- Prosser Hatchery	15 stacks	5	nya	nya	5000
Vertical Stack (Green- Eyed @ Little White Salmon NFH)	36 stacks	3	nya	8000	nya
Vertical Stack (Green- Eyed @ Willard NFH)	28 stacks	3-5	nya	nya	5000

Comments:

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

5.5 Rearing facilities.

190

Ponds (number)	Pond Type	Volume (cu.ft)	Length (ft.)	Width (ft.)	Depth (ft.)	Flow (gpm)	Maximum Flow Index	Maximum Density Index
16	Stainless Wall with Vinyl Line Raceways- Prosser Hatchery	3375	75	15	3	750	nya	0.75
6	Raceways- Flow Through (Per Acclimation Site)- Yakima Basin	5400	100	12	4.5	650	0.11	0.66
52	Nursery Tanks @ Willard NFH	91	nya	nya	nya	nya	nya	nya
50	Concrete Raceways @ Willard NFH	1408	80	8	2.2	nya	nya	nya

Comments:

Prosser Hatchery:

Above information for acclimation ponds was derived from Upper Yakima Spring Chinook CleElum Hatchery Procedures Manual, Working Draft, March 1998.

Note: Called and spoke directly with Bill Fiander (YN Program Mangager)on 10 January 2003 regarding acclimation facilities information (e.g. water source/Q and raceway specs/Q) for program. He will email information ASAP- probably will receive information week of January 12-18.

Derive additional information from Little White Salmon/Willard NFH Complex

text from Yakima River Coho HGMP:

Rearing

Fry are ponded at 1,100 fpp from the vertical stacks into the three upper, outside raceways. When the parr reach 500 fpp they are transferred to the four lower, outside raceways.

Acclimation/release

In 2000 (the current experimental design scheme through 2002) there were four acclimation sites chosen for the coho acclimation. There are two sites on the upper Yakima ? Easton D.O.T. Ponds and Hatchery Slough. There are two sites on the Naches- Lost Creek Ponds and Stiles Ponds. Each site had an early- released May 7, and a late- released May 28, release group. All fish were delivered to their respective acclimation site March 22-30. The initial number of fish at each site was as follows:

Lost Creek Ponds: early group- 122,214 coho; late group 113,791 coho.

Easton D.O.T. Ponds: early group - 123,386 coho; late group - 124,028 coho.

Hatchery Slough: early group ? 124,028 coho; late group ? 124,028 coho.

Stiles Pond: early group ? 123,991 coho; late group 119,339 coho.

There were approximately 20,000 PIT tagged coho per release group (8 mark groups). The coho were brought into the acclimation sites at 22 fish/lb. The early release groups were about 17 fish/lb at release, and the late release groups about 14 fish/lb.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Upper Yakima Spring Chinook CleElum Hatchery Procedures Manual, Working Draft, March 1998. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

5.6 Acclimation/release facilities.

190

Ponds (number)	Pond Type	Volume (cu.ft)	Length (ft.)	Width (ft.)	Depth (ft.)	Flow (gpm)	Maximum Flow Index	Maximum Density Index
16	Stainless Wall with Vinyl Line Raceways- Prosser Hatchery	3375	75	15	3	750	nya	0.75
6	Raceways- Flow Through (Per Acclimation Site)- Yakima Basin	5400	100	12	4.5	650	0.11	0.66
52	Nursery Tanks @ Willard NFH	91	nya	nya	nya	nya	nya	nya
50	Concrete Raceways @ Willard NFH	1408	80	8	2.2	nya	nya	nya

Comments:

Prosser Hatchery:

Above information for acclimation ponds was derived from Upper Yakima Spring Chinook CleElum Hatchery Procedures Manual, Working Draft, March 1998.

Note: Called and spoke directly with Bill Fiander (YN Program Mangager)on 10 January 2003 regarding acclimation facilities information (e.g. water source/Q and raceway specs/Q) for program. He will email information ASAP- probably will receive information week of January 12-18.

Derive additional information from Little White Salmon/Willard NFH Complex

text from Yakima River Coho HGMP:

Rearing

Fry are ponded at 1,100 fpp from the vertical stacks into the three upper, outside raceways. When the parr reach 500 fpp they are transferred to the four lower, outside raceways.

Acclimation/release

In 2000 (the current experimental design scheme through 2002) there were four acclimation sites chosen for the coho acclimation. There are two sites on the upper Yakima ? Easton D.O.T. Ponds and Hatchery Slough. There are two sites on the Naches- Lost Creek Ponds and Stiles Ponds. Each site had an early- released May 7, and a late- released May 28, release group. All fish were delivered to their respective acclimation site March 22-30. The initial number of fish at each site was as follows:

Lost Creek Ponds: early group- 122,214 coho; late group 113,791 coho.

Easton D.O.T. Ponds: early group - 123,386 coho; late group - 124,028 coho.

Hatchery Slough: early group ? 124,028 coho; late group ? 124,028 coho.

Stiles Pond: early group ? 123,991 coho; late group 119,339 coho.

There were approximately 20,000 PIT tagged coho per release group (8 mark groups). The coho were brought into the acclimation sites at 22 fish/lb. The early release groups were about 17 fish/lb at release, and the late release groups about 14 fish/lb.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Upper Yakima Spring Chinook CleElum Hatchery Procedures Manual, Working Draft, March 1998. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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

160. None

Comments:

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.

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.

70. Fish are not reared in multiple facilities or with redundant systems to reduce the risk of catastrophic loss.

78. The facility is sited so as to minimize the risk of catastrophic fish loss from flooding.

79. Staff is notified of emergency situations at the facility.

80. The facility is continuously staffed to assure the security of fish stocks on-site.

Comments:

Prosser Hatchery: Most of time, but experienced flooding in 1996. No fish loss, but were released into the river early.

LWS/Willard NFH= YES
nc
Prosser Hatchery: Staff members are on-site 24/7 during critical phases of the program, and the facility is enclosed in chain linked fence, and periodic patrols of law enforcement (local and tribal) maintain a security envelope of facility.

LWS/Willard NFH: Manager lives on-site.
nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

Section 6. Broodstock Origin and Identity

6.1 Source.

17. The broodstock chosen represents natural populations native or adapted to the watersheds in which hatchery fish will be released.

Comments:

Yakima Broodstock Source:

Coho were extirpated from the Yakima Basin, but through coho planting from out of basin facilities (e.g. Little White Salmon/Willard), a natural reproducing population was accomplished.

LWS/Willard NFH Broodstock Source: Columbia River Early run coho.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

6.2.1 History.

	Broodstock Source	Origin	Year(s) Used Begin	Year(s) Used End
	Cascade Hatchery Early Run Coho (ODFW)	H	U	U
	Lewis River Hatchery Early Run Coho (WDFW)	H	U	U
	Little White Salmon/Willard NFH Complex (USFWS)	H	1983	U
	Yakima River	N	1997	U
183.	nya	nya	nya	nya
	nya	nya	nya	nya
	nya	nya	nya	nya
	nya	nya	nya	nya
	nya	nya	nya	nya
	nya	nya	nya	nya
	nya	nya	nya	nya
	nya	nya	nya	nya

Comments:

Because coho salmon have been extirpated in the Yakima basin, the research into the feasibility of reintroducing the species relies on development of a coho brood stock from lower Columbia River populations. No wild stock from the mid-Columbia exists to use, and wild stocks from other areas such as British Columbia currently are unavailable. The domesticated Lower Columbia River stock (which originated from the Toutle River stock, with recent infusions of Sandy River stock) has been used since 1985. These fish have come as smolts from the Willard, Cascade, and/or Eagle Creek hatcheries. The numbers from each hatchery are negotiated annually, but the fish are from essentially the same stock regardless of which of the three lower river hatcheries they come from.

The project will rely less on the lower river stock (Willard) as the Yakima basin adult returns increase. In 1997 the Yakima program began collecting naturalized spawners at Prosser Dam. The long-term goal is to meet all smolt production goals using in basin (Yakima NORs) broodstock. Eventually broodstock collection will occur at Cowiche and Roza dams as the numbers of natural spawners increase into these two subbasins.

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

6.2.2 Annual size.

22. It is unknown whether the program collects sufficient numbers of donors from the natural stock to minimize founder effects.

23.

25.

27.

28.

Comments:

Broodstock is collected from adults returning to Prosser Dam/Chandler Canal area, and these fish are derivatives of introduced stocks from outside of the subbasin.

Broodstock for program is randomly collected at Prosser Dam facility over the adult run entry pattern.

text from Yakima River Coho HGMP:

In-basin broodstock are collected at Prosser Dam (RM 47), at the right ladder. Broodstock collection occurs between mid-September through mid-November, and fish are collected in proportion to the population run time past Prosser Dam. Based on the pre-season run forecast and the number of experimental and broodstock fish required, the total number of fish to be collected is proportioned in weekly increments throughout the run. This results in a pre-season, weekly collection target number (low in the tails of the run, and higher in the peak). At the beginning of a new week the steep-pass ladder is operated, and all fish are taken (no selection) until the weak?s target collection number is met.
The program objectives is to produce a self-sustaining natural population greater than 1000 fish per generation. The program guidelines set forth annual number of broodstock required for the program to meet this objective.

Yakima Broodstock: It is assumed that more than 10% of the broodstock are from naturally produced fish; but the current adult population cannot be discriminated between hatchery and naturally produced fish since fish have not been 100% marked.

LWS/Willard NFH Broodstock: It is assumed that 100% of broodstock is hatchery origin.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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

93

Return Year	Total Catch (all ages)	Natural Escapement		Hatchery Spawning	
		NoRs	HoRs	NoRs	HoRs
Goal	nya	nya	nya	nya	nya
1990	nya	nya	nya	nya	nya
1991	nya	nya	269	nya	nya
1992	nya	nya	190	nya	nya
1993	nya	nya	165	nya	nya
1994	nya	nya	560	nya	nya
1995	nya	nya	725	nya	nya
1996	nya	nya	1338	nya	nya
1997	nya	nya	1312	nya	nya
1998	nya	nya	4679	nya	nya
1999	nya	nya	3711	nya	196
2000	425	nya	5671	106	4
2001	54	nya	3133	80	411

Comments:

1. There was likely some NoR escapement from 1991 through 2000. However, HoR releases were only 100% marked beginning in brood year 1998, therefore enumeration of HoR and NoR escapement was only fully possible beginning in 2001.

2. Yakima River harvest in years other than 2000 and 2001 was likely at or near zero. However, these coho are also harvested in marine fisheries from Alaska south into Oregon and northern California, and in Columbia River fisheries from the mouth to the Hanford Reach. Fishery managers anticipate that a Yakima River fishery will develop when runs exceed 10,000 coho annually on a consistent basis.

Data source:

B. Bosch/YN, Prosser Count, Harvest, and Prosser Hatchery data files, 5/12/03.

6.2.4 Genetic or ecological differences.

19 The broodstock chosen displays morphological and life history traits similar to the natural population.

Comments:

Broodstock is derived from adults returning (naturally produced fish of hatchery origin-including LWS/Willard NFH) to Yakima River.

text from Yakima River Coho HGMP:

The primary reason for choosing Lower River brood stock to begin with is that it is the closest stock available geographically and it is the only early stock in the Columbia River basin.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.

6.2.5 Reasons for choosing.

18 The native stock has been extirpated, however the broodstock chosen is likely to adapt to the system based on life history and evolutionary history.

20

21 The broodstock chosen has the desired life history traits to meet harvest goals.

Comments:

text from Yakima River Coho HGMP:

The question of reverse domestication is going to be investigated as part of the genetics monitoring and evaluation program. At this time no definitive differences between NORs and HORs or their progeny has been observed. Part of the hatchery treatments is to investigate differences in survival between in-basin and out-of-basin stocks.
nc
Broodstock is derived from adults returning (naturally produced fish of hatchery origin-including LWS/Willard NFH) to Yakima River. The broodstock appears to meet the management and harvest objectives set forth in this phase of the program.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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.

The following procedures are in place that maintain broodstock collection within programmed levels:

161

- The collection plan for natural origin adults is in place that prevents collection of surplus fish

Comments:

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.

Section 7. Broodstock Collection

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

191

Year	Adults				
	Females	Males	Jacks	Eggs	Juveniles
Planned	nya	nya	nya	nya	nya
1990	868	902	0	nya	nya
1991	2985	2550	0	nya	nya
1992	1584	1328	0	nya	nya
1993	319	315	4	nya	nya
1994	802	713	0	nya	nya
1995	523	552	29	nya	nya
1996	240	227	5	nya	nya
1997	1353	1199	48	nya	nya
1998	1464	1449	10	nya	nya
1999	372	372	0	nya	nya
2000	1168	1077	25	nya	nya
2001	1365	1365	0	nya	nya

Comments:

Above information applies to LWS/Willard NFH Broodstock Collection.

Prosser Hatchery Broodstock Collection:

1997: 17 females, 15 males

1998: 28 females, 20 males

1999: 146 females, 140 males

2000: 175 females, 168 males

Waiting for additional data/information from Joe Blodgett as requested per emails over past several weeks (last email 01/13/03).

text from Yakima River Coho HGMP:

Production goals are based upon experimental requirements for Phase One feasibility study of the program.

2000 ? 2005

For the period 2000-2005, the Project will require approximately 1,000,000 smolts annually to accomplish the YKFP?s experimental objectives. Assuming a 50% female sex ratio for returning Yakima and Naches River coho, and a mean fecundity of 2900 eggs/female, 15% pre-spawning mortality and 85% egg to smolt survival, the Project must collect approximately 750 adults in order to meet its smolt production objectives. From 2000-2003, the fish would be used to test for acclimation site, temporal, and stock survival differences between fish released in the upper Yakima River subbasin and those released in the Naches River subbasin. In addition, the released fish would be used to complete ecological interaction studies. From 2004-2005, released fish would be used to develop localized broodstock.

From 2000 ? 2005, the Project expects to release up to 1 million coho smolts . It is expected that the majority of these fish would be produced by broodstock captured by the project (e.g. the 300,000 expected to be produced in 1999). Fish not produced by the project would be obtained from various lower Columbia River facilities. Fish obtained from other facilities will be programmed for release in the Yakima and

Naches River subbasins. All fish released will be used to meet program research and production goals.

Data source:

Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

7.2 Collection or sampling design

16.
- Broodstock collected by volitional return to adult capture pond.
- Broodstock collected at another facility.

22. unk

23.

24. Representative samples of the population are collected with respect to size, age, sex ratio, run and spawn timing, and other traits important to long-term fitness.

25. unk

27. unk

28. unk

Comments:

Broodstock is collected from adults returning to Prosser Dam/Chandler Canal area, and these fish are derivatives of introduced stocks from outside of the subbasin.

Broodstock for program is randomly collected at Prosser Dam facility over the adult run entry pattern.

text from Yakima River Coho HGMP:

In-basin broodstock are collected at Prosser Dam (RM 47), at the right ladder. Broodstock collection occurs between mid-September through mid-November, and fish are collected in proportion to the population run time past Prosser Dam. Based on the pre-season run forecast and the number of experimental and broodstock fish required, the total number of fish to be collected is proportioned in weekly increments throughout the run. This results in a pre-season, weekly collection target number (low in the tails of the run, and higher in the peak). At the beginning of a new week the steep-pass ladder is operated, and all fish are taken (no selection) until the weak?s target collection number is met.
YN broodstock collection guidelines and protocols specified random selection of adults over the run entry pattern. These YN guidelines and protocols are currently informal, but a formal document is being the YN.
YN broodstock collection guidelines and protocols specified random selection of adults over the run entry pattern, and should improve the probability of survival for the entire population.
The program objectives is to produce a self-sustaining natural population greater than 1000 fish per generation. The program guidelines set forth annual number of broodstock required for the program to meet this objective.
Yakima Broodstock: It is assumed that more than 10% of the broodstock are from naturally produced fish; but the current adult population cannot be discriminated between hatchery and naturally produced fish since fish have not been 100% marked.

LWS/Willard NFH Broodstock: It is assumed that 100% of broodstock is hatchery origin.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

7.3 Identity.

100. Marking techniques are used to distinguish among hatchery population segments.

101. 100% of the hatchery fish released are marked so that they can be distinguished from the natural population.

102. Marked fish can be identified using non-lethal means.

106. Wild fish make up unk % of the broodstock for this program.

Comments:

text from Yakima River Coho HGMP:

Beginning with the 2001 adult return (2000 smolt release) 100% of all the hatchery coho are adipose clipped and CWT'ed (snout). This marking scheme will occur at least through the 2002 smolt release. Prior to 2001 a varying proportion of smolts were adipose clipped and CWT'ed.
Beginning with the 2001 adult return (2000 smolt release) 100% of all the hatchery coho are adipose clipped and CWT (snout). This marking scheme will occur at least through the 2002 smolt release. Prior to 2001 a varying proportion of smolts were adipose clipped and CWT

nc
nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

7.4 Proposed number to be collected:

198. **7.4.1 Program goal (assuming 1:1 sex ratio for adults):**
nya

7.4.2 Broodstock collection levels for the last twelve years (e.g. 1990-2001), or for most recent years available.

	Adults				
Year	Females	Males	Jacks	Eggs	Juveniles
Planned	nya	nya	nya	nya	nya
1990	868	902	0	nya	nya
1991	2985	2550	0	nya	nya
1992	1584	1328	0	nya	nya
1993	319	315	4	nya	nya
1994	802	713	0	nya	nya
1995	523	552	29	nya	nya
1996	240	227	5	nya	nya
1997	1353	1199	48	nya	nya
1998	1464	1449	10	nya	nya
1999	372	372	0	nya	nya
2000	1168	1077	25	nya	nya
2001	1365	1365	0	nya	nya

101.

Comments:

Above information applies to LWS/Willard NFH Broodstock Collection.

Prosser Hatchery Broodstock Collection:

1997: 17 females, 15 males

1998: 28 females, 20 males

1999: 146 females, 140 males

2000: 175 females, 168 males

Waiting for additional data/information from Joe Blodgett as requested per emails over past several weeks (last email 01/13/03).

text from Yakima River Coho HGMP:

Production goals are based upon experimental requirements for Phase One feasibility study of the program.

2000 ? 2005

For the period 2000-2005, the Project will require approximately 1,000,000 smolts annually to accomplish the YKFP?s experimental objectives. Assuming a 50% female sex ratio for returning Yakima and Naches River coho, and a mean fecundity of 2900 eggs/female, 15% pre-spawning mortality and 85% egg to smolt survival, the Project must collect approximately 750 adults in order to meet its smolt production objectives. From 2000-2003, the fish would be used to test for acclimation site, temporal, and stock survival differences between fish released in the upper Yakima River subbasin and those released in the Naches River subbasin. In addition, the released fish would be used to complete ecological interaction studies. From 2004-2005, released fish would be used to develop localized broodstock.

From 2000 ? 2005, the Project expects to release up to 1 million coho smolts . It is expected that the majority of these fish would be produced by broodstock captured by the project (e.g. the 300,000 expected to be produced in 1999). Fish not produced by the project would be obtained from various lower Columbia River facilities. Fish obtained from other facilities will be programmed for release in the Yakima and Naches River subbasins. All fish released will be used to meet program research and production goals.

Data source:

Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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

The following procedures are in place that maintain broodstock collection within programmed levels:

161.
- The collection plan for natural origin adults is in place that prevents collection of surplus fish.

Comments:

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.

7.6 Fish transportation and holding methods.

187.

Equipment Type	Capacity (gallons)	Supplemental Oxygen (y/n)	Temperature Control (y/n)	Normal Transit Time (minutes)	Chemical(s) Used	Dosage (ppm)
Adult Transfer Tanker Truck	700	Y	N	5	Light dose MS	nya
Juvenile Transfer Tanker Truck	2500	Y	N	150	nya	nya
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya

188.

Ponds (number)	Pond Type	Volume (cu. ft)	Length (ft.)	Width (ft.)	Depth (ft.)	Available Flow (gpm)
1	Vinyl line Raceway	22000	150	50	4	1100
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya

33. Broodstock is collected and held in a manner that results in less than 10% prespawning mortality.

99. IHOT guidelines for transport are followed for this program.

Comments:

Above information applies to Prosser Hatchery

Derive LWS/Willard NFH information from complex manager.

Above information applies to Prosser Hatchery.

Derive additional information from Little White Salmon/Willard NFH Complex

nc
Adults are captured at steep pass at Prosser Dam. Trucked ½ mile to Prosser Hatchery and held in large holding ponds. They are treated with formalin and checked weekly for ripeness. When ripe they are spawned at Prosser Hatchery.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

7.7 Describe fish health maintenance and sanitation procedures applied.

98. "Fish transfers into the subbasin are inspected and accompanied by notifications as described in IHOT and PNFHPC guidelines.

92. Integrated Hatchery Operations Team (IHOT), Pacific Northwest Fish Health Protection committee (PNFHPC), state or tribal guidelines are followed for broodstock fish health inspection , transfer of eggs or adults and broodstock holding and disposal of carcasses.

Comments:

nc
nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

7.8 Disposition of carcasses.

92. Integrated Hatchery Operations Team (IHOT), Pacific Northwest Fish Health Protection committee (PNFHPC), state or tribal guidelines are followed for broodstock fish health inspection , transfer of eggs or adults and broodstock holding and disposal of carcasses.

103. Hatchery adults are distributed by staff within the subbasin to provide hatchery adults are distributed (by staff) within the subbasin to provide ecological benefits .

The following procedures are in polace that maintain broodstock collection within programmed levels:

161. - The collection plan for natural origin adults is in place that prevents collection of surplus fish

Comments:

nc
Carcasses are distributed into subbasin waters in vicinity of the facility.

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

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.

29. The program has NO guidelines for acceptable contribution of hatchery fish to natural spawning.

30.

92. Integrated Hatchery Operations Team (IHOT), Pacific Northwest Fish Health Protection committee (PNFHPC), state or tribal guidelines are followed for broodstock fish health inspection , transfer of eggs or adults and broodstock holding and disposal of carcasses.

Comments:

The primary objective of the program is the restoration/recovery of a natural spawning population using hatchery and hatchery/natural derivatives.
nc
nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

Section 8. Mating

8.1 Selection method.

35. Males and females available on a given day are mated randomly.

39.

Comments:

Prosser Hatchery:

Spawning occurs on a weekly basis utilizing whatever females and males are ripe for that particular week.

Males

Eggs are fertilized with more than one male whenever possible, however, to the extent possible, males are only used once (one-to-one spawning). Jacks are incorporated into the mating scheme.

Fertilization

Three males in a cup and three females in a bucket are fertilized. Males and females are selected randomly.

LWS/Willard NFH Complex:

Fish are sorted over a one to two day period with ripe females being spawned and green females sent back to the ponds until 100% of the fish have been chacked. Enough male fish are sent back to the pond with the green females to ensure a 1:1 spawning ratio. The eggs collected during this sorting process are considered a ?take?. Male spawners are randomly selected during the take with up to five percent of males used being jacks.

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

8.2 Males.

38. Precocious males are used as a set percentage or in proportion to their contribution to the adult run.

37. Back-up males are used in the spawning protocol.

Comments:

Prosser Hatchery:

Males

Eggs are fertilized with more than one male whenever possible, however, to the extent possible, males are only used once (one-to-one spawning). Jacks are incorporated into the mating scheme.

LWS/Willard NFH Complex:

Up to five percent of males used are jacks. The number of jacks spawned on a given day is subjectively defined by hatchery staff up to the five percent maximum and is dependent on availability and ripeness.

Prosser Hatchery:

Males

Eggs are fertilized with more than one male whenever possible, however, to the extent possible, males are only used once (one-to-one spawning). Jacks are incorporated into the mating scheme.

LWS/Willard Hatchery Complex:

During low escapement years, males have been re-used on an as-needed basis to maximize the total number of females available to spawn. In low escapement years, it is better to spawn the available females (and not lose that genetic material), than discard them. Under these conditions, reusing male fish does not compromise the genetic diversity of the hatchery stocks. It was determined that, in all instances, a minimum escapement need had been met to maintain genetic diversity, although some male fish had to be reused to achieve production goals.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

8.3 Fertilization.

36. Gametes are pooled prior to fertilization.

39.

41. IHOT PNFHPC tribal federal guidelines are followed for culture practices for this program.

40. Disinfection procedures that prevent pathogen transmission between stocks of fish are implemented during spawning.

Comments:

Prosser Hatchery= YES

Three males in a cup and three females in a bucket are fertilized. Males and females are selected randomly.

LWS/Willard NFH Complex: Answer= NO
nc
text from Yakima River Coho HGMP:

These are the program objectives as stated in the draft Yakima Coho Planning Status Report (2001) for the YKFP.

Experimental

-Determine the feasibility of re-establishing a sustainable, naturally spawning coho population in the Yakima Basin with sufficient productivity to sustain a meaningful in-basin fishery in most years.

Natural Production

-Optimize production of naturalized populations of coho with respect to abundance and distribution.

Ecological Interactions

-Minimize adverse impacts of coho reintroduction on Non-taxa Target of Concern (NTTOC).

-Limit losses of wild and hatchery coho smolts to native and exotic predators to levels that do not significantly limit coho production potential.

Genetic

-Establish a Yakima River coho stock with heritable life history traits adapted to the Yakima River Basin.

Harvest

-Expand harvest opportunities for treaty Tribal and sport fisheries inside and outside of the Yakima River Basin while meeting objectives for genetics, experimentation, natural production and ecological interactions.
Per IHOT and U.S. Fish & Wildlife guidelines.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

8.4 Cryopreserved gametes.

162. Cryopreserved gametes are not used.

Comments:

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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.

35. Males and females available on a given day are mated randomly.

36. Gametes are pooled prior to fertilization.

37. Back-up males are used in the spawning protocol.

38. Precocious males are used as a set percentage or in proportion to their contribution to the adult run.

39.

Comments:

Prosser Hatchery:

Spawning occurs on a weekly basis utilizing whatever females and males are ripe for that particular week.

Males

Eggs are fertilized with more than one male whenever possible, however, to the extent possible, males are only used once (one-to-one spawning). Jacks are incorporated into the mating scheme.

Fertilization

Three males in a cup and three females in a bucket are fertilized. Males and females are selected randomly.

LWS/Willard NFH Complex:

Fish are sorted over a one to two day period with ripe females being spawned and green females sent back to the ponds until 100% of the fish have been checked. Enough male fish are sent back to the pond with the green females to ensure a 1:1 spawning ratio. The eggs collected during this sorting process are considered a "take". Male spawners are randomly selected during the take with up to five percent of males used being jacks.

Prosser Hatchery= YES

Three males in a cup and three females in a bucket are fertilized. Males and females are selected randomly.

LWS/Willard NFH Complex: Answer= NO
Prosser Hatchery:

Males

Eggs are fertilized with more than one male whenever possible, however, to the extent possible, males are only used once (one-to-one spawning). Jacks are incorporated into the mating scheme.

LWS/Willard Hatchery Complex:

During low escapement years, males have been re-used on an as-needed basis to maximize the total number of females available to spawn. In low escapement years, it is better to spawn the available females (and not lose that genetic material), than discard them. Under these conditions, reusing male fish does not compromise the genetic diversity of the hatchery stocks. It was determined that, in all instances, a minimum escapement need had been met to maintain genetic diversity, although some male fish had to be reused to achieve production goals.

Prosser Hatchery:

Males

Eggs are fertilized with more than one male whenever possible, however, to the extent possible, males are only used once (one-to-one spawning). Jacks are incorporated into the mating scheme.

LWS/Willard NFH Complex:

Up to five percent of males used are jacks. The number of jacks spawned on a given day is subjectively defined by hatchery staff up to the five percent maximum and is dependent on availability and ripeness.

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

Section 9. Incubation and Rearing.

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

192

Year	Egg Take	Green-Eyed Survival (%)	Eyed-Ponding Survival (%)	Egg Survival Performance Std.	Fry-fingerling Survival (%)	Rearing Survival Performance Std.	Fingerling-Smolt Survival (%)
1990	nya	nya	nya	nya	nya	nya	nya
1991	nya	nya	nya	nya	nya	nya	nya
1992	nya	nya	nya	nya	nya	nya	nya
1993	nya	nya	nya	nya	nya	nya	nya
1994	2499034	86.2	86.2	nya	nya	nya	87.9
1995	1520315	86.1	84.8	nya	nya	nya	83.7
1996	653713	81.2	80.6	nya	nya	nya	96.0
1997	3459191	80.2	78.5	nya	nya	nya	95.0
1998	4074779	82.3	79.8	nya	nya	nya	89.4
1999	1101735	81.9	81.0	nya	nya	nya	93.1
2000	3721023	83.6	78.2	nya	nya	nya	96.1
2001	3721023	77.9	77.9	nya	nya	nya	NA

Comments:

Above information applies to LWS/Willard NFH

1) Numbers in Eyed-Ponding Survival Column= Green-Ponding Survival.

2) Numbers in Fingerling-Smolt Survival are for fish releases into Little White Salmon river.

Prosser Hatchery: Waiting for data/information from Joe Blodgett as requested per emails over past several weeks (last email 01/13/03).

text from Yakima River Coho HGMP:

The egg take has ranged from 50K to 350K since broodstock collection was initiated in 1997. The egg take goal is 1M smolts. The rearing protocol allows for an egg-to-smolt survival rate of 65%. The unwritten egg-to-ponding survival goal is 90% (currently at 70% due unidentified mortality cause(s).

Data source:

Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

9.1.2 Cause for, and disposition of surplus egg takes.

163 None at this point in the program.

45.

46 Families are NOT incubated individually.

58 No culling of juveniles occur.

60.

61.

44 0 (eggs are never culled)

Comments:

nc
nc
nc
nc
nc
Culling for dead and disease eggs only

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

9.1.3 Loading densities applied during incubation.

51 Integrated Hatchery Operations Team (IHOT) species-specific incubation recommendations were followed for water quality , flows , temperature , substrate and incubator capacities.

47 Families within spawning groups are mixed randomly at ponding so that unintentional rearing differences affect families equally.

42 Eggs are incubated under conditions that result in equal survival of all segments of the population to ponding.

Comments:

Above information applies to Vertical Stack incubators at Prosser.

Deep troughs at Prosser Hatchery: a= Yes, b= yes, c= yes, d & e= no

LWS/Willard NFH Complex: a= Yes, b= yes, c= yes, d & e= no
nc
text from Yakima River Coho HGMP:

Loading density is approximately 5,000 eggs per tray (Heath). Egg size is not currently recorded.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

9.1.4 Incubation conditions.

49 Incubation takes place in home stream water.

50 The program does NOT use water sources that result in hatching/emergence timing similar to that of the naturally produced population.

51 Integrated Hatchery Operations Team (IHOT) species-specific incubation recommendations were followed for water quality , flows , temperature , substrate and incubator capacities.

53 Eggs are NOT monitored to determine fertilization efficiency and embryonic development.

42 Eggs are incubated under conditions that result in equal survival of all segments of the population to ponding.

47 Families within spawning groups are mixed randomly at ponding so that unintentional rearing differences affect families equally.

46 Families are NOT incubated individually.

43 Incubation conditions are manipulated as to synchronize ponding of fry.

Comments:

Prosser Hatchery: Incubation water is a on-site shallow well source that is probably recharged from sources similar to the Chandler Canal/ Yakima surface water.
nc
Above information applies to Vertical Stack incubators at Prosser.

Deep troughs at Prosser Hatchery: a= Yes, b= yes, c= yes, d & e= no

LWS/Willard NFH Complex: a= Yes, b= yes, c= yes, d & e= no
Monitored for Temperature Units

text from Yakima River Coho HGMP:

In 2000 we had soft shell in the coho eggs. No formal fish health screenings occur during incubation. However, adult broodstock are screened for routine bacteria and viruses at the time of spawning by USFWS.
nc
nc
nc
Prosser Hatchery= YES

Temperature control to micmic natural conditions.

LWS/Willard NFH= NO

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

9.1.5 Ponding.

The procedures used for determining when fry are ponded include:

55. - Fry are ponded based on visual inspection of the amount of yolk remaining

46. Eggs are NOT incubated in a manner that allows volitional ponding of fry.

Comments:

text from Yakima River Coho HGMP:

Fry are volitionally ponded at nearly 100% button up. This occurs at approximately 1,400 TUs. Fry are approximately 35mm in fork length at ponding. Any remaining fry are ponded the end of March.
Prosser Hatchery= No

Fry are moved from vertical trays to outside ponds at nearly 100% button up. This occurs at approximately 1,400 TUs. Fry are approximately 35mm in fork length at ponding. Any remaining fry are ponded the end of March.

LWS/Willard NFH= NO

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

9.1.6 Fish health maintenance and monitoring.

52. Disinfection procedures are implemented during incubation that prevent pathogen transmission between stocks of fish on site.

53. Eggs are not monitored when needed to determine fertilization efficiency and embryonic development.

54. Following eye-up stage, eggs are inventoried, and dead or undeveloped eggs removed and disposed of as described in the disease control guidelines.

56. Dead or culled eggs are discarded in a manner that prevents transmission to receiving watershed.

Comments:

nc
Monitored for Temperature Units

text from Yakima River Coho HGMP:

In 2000 we had soft shell in the coho eggs. No formal fish health screenings occur during incubation. However, adult broodstock are screened for routine bacteria and viruses at the time of spawning by USFWS.
Per IHOT and U.S.Fish & Wildlife Fish Health and Pathology Guidelines

Prosser Hatchery: Eggs thrown into dumpster.

LWS/Willard NFH Complex: According to the USFWS fish health policy in 713 FW.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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.

47. Families within spawning groups are mixed randomly at ponding so that unintentional rearing differences affect families equally.

49. Incubation takes place in home stream water.

50. The program does NOT use water sources that result in hatching/emergence timing similar to that of the naturally produced population.

51. Integrated Hatchery Operations Team (IHOT) species-specific incubation recommendations were followed for water quality , flows , temperature , substrate and incubator capacities.

52. Disinfection procedures are implemented during incubation that prevent pathogen transmission between stocks of fish on site.

56. Dead or culled eggs are discarded in a manner that prevents transmission to receiving watershed.

61. Families are NOT culled to minimize family size variation.

Comments:

nc
Prosser Hatchery: Incubation water is a on-site shallow well source that is probably recharged from sources similar to the Chandler Canal/ Yakima surface water.
nc
Above information applies to Vertical Stack incubators at Prosser.

Deep troughs at Prosser Hatchery: a= Yes, b= yes, c= yes, d & e= no

LWS/Willard NFH Complex: a= Yes, b= yes, c= yes, d & e= no
nc
Prosser Hatchery: Eggs thrown into dumpster.

LWS/Willard NFH Complex: According to the USFWS fish health policy in 713 FW.
nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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 (1990-2001), or for years dependable data are available.

192.

Year	Egg Take	Green-Eyed Survival (%)	Eyed-Ponding Survival (%)	Egg Survival Performance Std.	Fry-fingerling Survival (%)	Rearing Survival Performance Std.	Fingerling-Smolt Survival (%)
1990	nya	nya	nya	nya	nya	nya	nya
1991	nya	nya	nya	nya	nya	nya	nya
1992	nya	nya	nya	nya	nya	nya	nya
1993	nya	nya	nya	nya	nya	nya	nya
1994	2499034	86.2	86.2	nya	nya	nya	87.9
1995	1520315	86.1	84.8	nya	nya	nya	83.7
1996	653713	81.2	80.6	nya	nya	nya	96.0
1997	3459191	80.2	78.5	nya	nya	nya	95.0
1998	4074779	82.3	79.8	nya	nya	nya	89.4
1999	1101735	81.9	81.0	nya	nya	nya	93.1
2000	3721023	83.6	78.2	nya	nya	nya	96.1
2001	3721023	77.9	77.9	nya	nya	nya	NA

Comments:

Above information applies to LWS/Willard NFH

1) Numbers in Eyed-Ponding Survival Column= Green-Ponding Survival.

2) Numbers in Fingerling-Smolt Survival are for fish releases into Little White Salmon river.

Prosser Hatchery: Waiting for data/information from Joe Blodgett as requested per emails over past several weeks (last email 01/13/03).

text from Yakima River Coho HGMP:

The egg take has ranged from 50K to 350K since broodstock collection was initiated in 1997. The egg take goal is 1M smolts. The rearing protocol allows for an egg-to-smolt survival rate of 65%. The unwritten egg-to-ponding survival goal is 90% (currently at 70% due unidentified mortality cause(s).

Data source:

Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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

71. The juvenile rearing density and loading guidelines used at the facility are based on: standardized agency guidelines and staff experience (e.g. trial and error) .

72. IHOT standards are followed for: water quality , alarm systems , predator control measures to provide the necessary security for the cultured stock , loading and density.

Comments:

Above answers apply to Prosser Hatchery;

LWS/Willard NFH: a, b, c, & d= Yes

The goal is 0.50 lb fish per cubic foot of rearing space.
nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

9.2.3 Fish rearing conditions.

66. The program does NOT use a diet and growth regime that mimics the natural seasonal growth patterns.

67. Settleable solids, unused feed and feces are removed periodically to ensure proper cleanliness of rearing containers.

72. IHOT standards are followed for: water quality , alarm systems , predator control measures to provide the necessary security for the cultured stock , loading and density.

71. The juvenile rearing density and loading guidelines used at the facility are based on standardized agency guidelines and staff experience (e.g. trial and error) .

Comments:

nc
Rearing containers are cleaned daily. Rearing containers are treated according to the Agency Disinfection and Sanitation Guidelines.
nc
Above answers apply to Prosser Hatchery;

LWS/Willard NFH: a, b, c, & d= Yes

The goal is 0.50 lb fish per cubic foot of rearing space.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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.

	Rearing Period	Length (mm)	Weight (fpp)	Condition Factor	Growth Rate	Hepatosomatic Index	Body Moisture Content
	February 2000	34.6	1194	nya	nya	nya	nya
	March 2000	46.6	492	nya	nya	nya	nya
	April 2000	53.0	334	nya	nya	nya	nya
	May 2000	63.2	197	nya	nya	nya	nya
	June 2000	71.5	126	nya	nya	nya	nya
	July 2000	88.1	72.6	nya	nya	nya	nya
194.	August 2000	102.7	45.9	nya	nya	nya	nya
	September 2000	112.5	34.9	nya	nya	nya	nya
	October 2000	118.4	29.9	nya	nya	nya	nya
	November 2000	121.6	27.6	nya	nya	nya	nya
	December 2000	123.3	26.5	nya	nya	nya	nya
	January 2001	125.0	25.4	nya	nya	nya	nya

Comments:

February 2001= 131.29 mm; 21.9 fpp

March 2001= 135.3 mm; 20.1 fpp

April 2001= 140.0 mm; 18.1 fpp

Above information applies to LWS/Willard NFH

Prosser Hatchery: Waiting for data/information from Joe Blodgett as requested per emails over past several weeks (last email 01/13/03).

Data source:

Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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

- Feeding rates are followed so that fish size is within 10% of program goal each year.
- 64. Feed is stored under proper conditions as described by IHOT guidelines.

65. The correct amount and type of food is provided to achieve the desired growth rate and condition factorsfor the species and life stages being reared.

	Rearing Period	Length (mm)	Weight (fpp)	Condition Factor	Growth Rate	Hepatosomatic Index	Body Moisture Content
	February 2000	34.6	1194	nya	nya	nya	nya
	March 2000	46.6	492	nya	nya	nya	nya
	April 2000	53.0	334	nya	nya	nya	nya
	May 2000	63.2	197	nya	nya	nya	nya
	June 2000	71.5	126	nya	nya	nya	nya
	July 2000	88.1	72.6	nya	nya	nya	nya
194.	August 2000	102.7	45.9	nya	nya	nya	nya
	September 2000	112.5	34.9	nya	nya	nya	nya
	October 2000	118.4	29.9	nya	nya	nya	nya
	November 2000	121.6	27.6	nya	nya	nya	nya
	December 2000	123.3	26.5	nya	nya	nya	nya
	January 2001	125.0	25.4	nya	nya	nya	nya

66. The program does NOT use a diet and growth regime that mimics the natural seasonal growth patterns.

Comments:

Above answers apply to Prosser Hatchery

LWS/Willard NFH: a, b, & c= Yes.

Moore Clark dry pellets appropriate to size of fish being fed is used. Fish are fed according to body size, water temperature, and desired release size (ranging from 1½-5% of body weight).
nc
February 2001= 131.29 mm; 21.9 fpp

March 2001= 135.3 mm; 20.1 fpp

April 2001= 140.0 mm; 18.1 fpp

Above information applies to LWS/Willard NFH

Prosser Hatchery: Waiting for data/information from Joe Blodgett as requested per emails over past several weeks (last email 01/13/03).

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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*).

- Feeding rates are followed so that fish size is within 10% of program goal each year.
- Feed is stored under proper conditions as described by IHOT guidelines.

64.

65.

The correct amount and type of food is provided to achieve the desired growth rate and condition factorsfor the species and life stages being reared.

Rearing Period	Food Type	Application Schedule (#feedings/day)	Feeding Rate Range (%B.W./day)	Lbs. Fed Per gpm of Inflow	Food Conversion During Period
nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya

195.

Comments:

Above answers apply to Prosser Hatchery

LWS/Willard NFH: a, b, & c= Yes.

Moore Clark dry pellets appropriate to size of fish being fed is used. Fish are fed according to body size, water temperature, and desired release size (ranging from 1½-5% of body weight).
nc
LWS/Willard NFH:

The fish are fed BioMoist starter, grower and feed following manufacturer recommendations (generally between 3.5% and 0.5% of body weight per day). They are fed between two and nine times daily depending on fish size. Overall conversions are around 1.1.

Prosser Hatchery: Waiting for data/information from Joe Blodgett as requested per emails over past several weeks (last email 01/13/03).

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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

62. IHOT fish health guidelines are followed to prevent transmission between lots of fish on site or transmission or amplification to or within the watershed.

63. Vaccines are NOT used, whenever possible, to minimize the use of antimicrobial compounds.

71. The juvenile rearing density and loading guidelines used at the facility are based on standardized agency guidelines and staff experience (e.g. trial and error) .

Comments:

Vacines are not used in this program.

According to USFWS procedures and guidelines in 713 FW, and IHOT.

Juveniles are screened monthly for routine bacteria, viruses and parasites by USFWS.

Above answers apply to Prosser Hatchery;

LWS/Willard NFH: a, b, c, & d= Yes

The goal is 0.50 lb fish per cubic foot of rearing space.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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

87. The migratory state of the release population is determined by volitional release .

Comments:

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.

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

68. The program attempts to better mimic the natural rearing environment by reducing rearing density below agency or other guidelines) and rearing under natural water temperature .

69. Fish produced are qualitatively similar to natural fish in fpp and length , morphology , behavior , physiological status and health .

66.

84. Fish are released at sizes similar to natural fish of the same life stage and species.

88. Fish are NOT released in a manner that simulates natural seasonal migration patterns.

Comments:

Above answers apply to Prosser Hatchery

LWS/Willard NFH: a, b,c, d, e,& f= No. g= Yes
nc
nc
text from Yakima River Coho HGMP:

Rearing and release strategies are designed to limit the amount of ecological interactions occurring between hatchery and naturally produced fish. Fish are reared to sufficient size such that smoltification occurs within nearly the entire population, which will reduce retention in the streams after release. Rearing on parent river water or acclimation for several weeks to parent river water is done to ensure homing to the stream reaches geographically adjacent to the acclimation sites. Following the experimental design, there is an early release on May 7th and a late release on May 28th . Releases are volitional from all four sites.
Fish are volitionally released over a two week period and forced out of the rearing units at the end of the two week period, during the latter part of the natural outmigration window.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

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.

60. dna

72. IHOT standards are followed for: water quality , alarm systems , predator control measures to provide the necessary security for the cultured stock , loading and density.

80. The facility is continuously staffed to assure the security of fish stocks on-site.

84. Fish are released at sizes similar to natural fish of the same life stage and species.

89. Fish are NOT released in a manner that simulates natural seasonal migration patterns.

98. "Fish transfers into the subbasin are inspected and accompanied by notifications as described in IHOT and PNFHPC guidelines.

76. Fish inventory data accurately reflect rearing vessel population abundance with 10%.

85. Volitional release is NOT practiced during natural out-migration timing.

96. Fish are released in the same subbasin as the final rearing facility.

Comments:

nc
nc
Prosser Hatchery: Staff members are on-site 24/7 during critical phases of the program, and the facility is enclosed in chain linked fence, and periodic patrols of law enforcement (local and tribal) maintain a security envelope of facility.

LWS/Willard NFH: Manager lives on-site.
text from Yakima River Coho HGMP:

Rearing and release strategies are designed to limit the amount of ecological interactions occurring between hatchery and naturally produced fish. Fish are reared to sufficient size such that smoltification occurs within nearly the entire population, which will reduce retention in the streams after release. Rearing on parent river water or acclimation for several weeks to parent river water is done to ensure homing to the stream reaches geographically adjacent to the acclimation sites. Following the experimental design, there is an early release on May 7th and a late release on May 28th . Releases are volitional from all four sites.
Fish are volitionally released over a two week period and forced out of the rearing units at the end of the two week period, during the latter part of the natural outmigration window.
nc
nc
The releases do fall within the latter part of the natural outmigration window. Rearing and release strategies are designed to limit the amount of ecological interactions occurring between hatchery and naturally produced fish. Fish are reared to sufficient size such that smoltification occurs within nearly the entire population, which will reduce retention in the streams after release. Rearing on parent river water or acclimation for

several weeks to parent river water is done to ensure homing to the stream reaches geographically adjacent to the acclimation sites. Following the experimental design, there is an early release on May 7th and a late release on May 28th . Releases are volitional from all four sites.
Prosser Hatchery= YES

LWS/Willard NFH= NO

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

Section 10. Release

10.1 Proposed fish release levels.

				Location			
Age Class	Maximum Number	Size (ffp)	Release Date	Stream	Release Point (RKm)	Major Watershed	Ecoprovince
Eggs	nya	nya	nya	nya	nya	nya	nya
Unfed Fry	nya	nya	nya	nya	nya	nya	nya
Fry	nya	nya	nya	nya	nya	nya	nya
Fingerling	nya	nya	nya	nya	nya	nya	nya
Yearling	500000	12-15	May 7 (Early Release) and May 28 (Late Release)	Easton Pond (Yakima R.), and Hatchery Slough (Cle Elum Hatchery)	nya	Yakima	Columbia Plateau

Comments:

PROGRAM DESCRIPTION

Broodstock Capture:

Willard National Fish Hatchery (out-of- basin stock), and Prosser Dam, right bank steep-pass ladder (Yakima stock).

Broodstock Holding to Maturity:

Prosser Hatchery, (Yakima broodstock), and Willard National Fish Hatchery (out-of-basin broodstock).

Fish Spawning, Incubation, Rearing:

Spawning: Prosser Hatchery (Yakima broodstock), and Willard National Fish Hatchery (out-of-basin broodstock).

Incubation: Prosser Hatchery, (Yakima stock), and Willard National Fish Hatchery (out-of-basin stock).

Initial Rearing: Prosser Hatchery, (Yakima stock), and Willard National Fish Hatchery (out-of-basin stock).

Final Rearing and Acclimation: Yakima Basin and out-of-basin stocks - Yakima River: Easton D.O.T. Ponds and Hatchery Slough.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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

				Location			
Age Class	Maximum Number	Size (ffp)	Release Date	Stream	Release Point (RKm)	Major Watershed	Ecoprovince
Eggs	nya	nya	nya	nya	nya	nya	nya
Unfed Fry	nya	nya	nya	nya	nya	nya	nya
Fry	nya	nya	nya	nya	nya	nya	nya
Fingerling	nya	nya	nya	nya	nya	nya	nya
Yearling	500000	12-15	May 7 (Early Release) and May 28 (Late Release)	Easton Pond (Yakima R.), and Hatchery Slough (Cle Elum Hatchery)	nya	Yakima	Columbia Plateau

Fish are released in the same subbasin as the final rearing facility.

Comments:

PROGRAM DESCRIPTION

Broodstock Capture:

Willard National Fish Hatchery (out-of- basin stock), and Prosser Dam, right bank steep-pass ladder (Yakima stock).

Broodstock Holding to Maturity:

Prosser Hatchery, (Yakima broodstock), and Willard National Fish Hatchery (out-of-basin broodstock).

Fish Spawning, Incubation, Rearing:

Spawning: Prosser Hatchery (Yakima broodstock), and Willard National Fish Hatchery (out-of-basin broodstock).

Incubation: Prosser Hatchery, (Yakima stock), and Willard National Fish Hatchery (out-of-basin stock).

Initial Rearing: Prosser Hatchery, (Yakima stock), and Willard National Fish Hatchery (out-of-basin stock).

Final Rearing and Acclimation: Yakima Basin and out-of-basin stocks - Yakima River: Easton D.O.T. Ponds and Hatchery Slough.

Prosser Hatchery= YES

LWS/Willard NFH= NO

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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

>

	Eggs / Unfed Fry Release			Fry Release			Fingerling Release			Yearling Release		
Release Year	Number	Date (MM/DD)	Avg Size (fpp)	Number	Date (MM/DD)	Avg size (fpp)	Number	Date (MM/DD)	Avg Size (fpp)	Number	Date (MM/DD)	Avg Size (fpp)
1991	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya
1992	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya
1993	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya
1994	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya
1995	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya
1996	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya
1997	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya
1998	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya
1999	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya
2000	nya	nya	nya	nya	nya	nya	nya	nya	nya	1112458	May 7 (Early Release) and May 28 (Late Release)	22
2001	nya	nya	nya	nya	nya	nya	nya	nya	nya	671222	May 7 (Early Release) and May 28 (Late Release)	27
2002	nya	nya	nya	nya	nya	nya	nya	nya	nya	305188	May 7 (Early Release) and May 28 (Late Release)	23
Avg	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya

Comments:

Above information/data applies to LWS/Willard coho production transferred to Yakima/Naches Sites. Note: Number of fish and size at release are assumed to be approximate that when introduced from LWS/Willard. It is assumed that growth and mortality are negible during acclimation period since water temperatures are relatively cold.

LWS/Willard NFH Complex Yakima Basin Component Transport to Acclimation Sites during April of each year.

2000

1) Hatchery Slough (ClaElum)= 370410 smolts @ ~23 fpp

2) Easton= 246652 smolts @ ~22fpp

3) Stiles= 248440 smolts @ ~21 fpp

4) Lost Creek= 246956 smolts @ ~22 fpp

2001

1) Hatchery Slough (ClaElum)= 165330 smolts @ ~26.3 fpp

2) Easton= 167830 smolts @ ~27.3 fpp

3) Stiles= 169164 smolts @ ~27 fpp

4) Lost Creek= 168898 smolts @ ~28 fpp

2002

1) Hatchery Slough (ClaElum)= no data

2) Easton= 123813 smolts @ ~23 fpp

3) Stiles= 60529 smolts @ ~23 fpp

4) Lost Creek= 120846 smolts @ ~23 fpp

Prosser Hatchery: Waiting for data/information from Joe Blodgett as requested per emails over past several weeks (last email 01/13/03).

Data source:

LWS/Willard Complex Coho Data derived from dbase file provided by USFWS staff at Little White Salmon-Willard NFH Complex.

10.4 Actual dates of release and description of release protocols.

84. Fish are released at sizes similar to natural fish of the same life stage and species.

85. Fish are released at a time, size, location, and in a manner that achieves harvest goals for the stock.

86.

88. Fish are NOT released in a manner that simulates natural seasonal migration patterns.

89.

90. Fish are released at an optimum time and size that has been determined by survival studies from another facility.

91. Fish are released at a time and size specified in an established juvenile production goal.

92. The carrying capacity of the subbasin has NOT been taken into consideration in sizing this program.

87. The migratory state of the release population is determined by volitional release .

Comments:

The releases do fall within the latter part of the natural outmigration window. Rearing and release strategies are designed to limit the amount of ecological interactions occurring between hatchery and naturally produced fish. Fish are reared to sufficient size such that smoltification occurs within nearly the entire population, which will reduce retention in the streams after release. Rearing on parent river water or acclimation for several weeks to parent river water is done to ensure homing to the stream reaches geographically adjacent to the acclimation sites. Following the experimental design, there is an early release on May 7th and a late release on May 28th . Releases are volitional from all four sites.
nc
text from Yakima River Coho HGMP:

Rearing and release strategies are designed to limit the amount of ecological interactions occurring between hatchery and naturally produced fish. Fish are reared to sufficient size such that smoltification occurs within nearly the entire population, which will reduce retention in the streams after release. Rearing on parent river water or acclimation for several weeks to parent river water is done to ensure homing to the stream reaches geographically adjacent to the acclimation sites. Following the experimental design, there is an early release on May 7th and a late release on May 28th . Releases are volitional from all four sites.
Fish are volitionally released over a two week period and forced out of the rearing units at the end of the two week period, during the latter part of the natural outmigration window.
nc
nc
nc
The program specifies release times and sizes for fish.

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

10.5 Fish transportation procedures, if applicable.

96. Fish are released in the same subbasin as the final rearing facility.

187.

Equipment Type	Capacity (gallons)	Supplemental Oxygen (y/n)	Temperature Control (y/n)	Normal Transit Time (minutes)	Chemical(s) Used	Dosage (ppm)
Adult Transfer Tanker Truck	700	Y	N	5	Light dose MS	nya
Juvenile Transfer Tanker Truck	2500	Y	N	150	nya	nya
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya

Comments:

Prosser Hatchery= YES

LWS/Willard NFH= NO

Above information applies to Prosser Hatchery

Derive LWS/Willard NFH information from complex manager.

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

10.6 Acclimation procedures (*methods applied and length of time*).

168. Pre-smolts are acclimated approximately six or nine weeks depending on the release treatment (early or late). Fish are fed daily throughout the acclimation period and initial during the post release period until most of the fish have left. Typical fish culture activities include net maintenance, pond cleaning (if applicable), mortality assessments, and growth and fish health measurements.

Comments:

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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

100. Marking techniques are used to distinguish among hatchery population segments.

101. 100% of the hatchery fish released are marked so that they can be distinguished from the natural population.

102. Marked fish can be identified using non-lethal means.

Comments:

text from Yakima River Coho HGMP:

Beginning with the 2001 adult return (2000 smolt release) 100% of all the hatchery coho are adipose clipped and CWTed (snout). This marking scheme will occur at least through the 2002 smolt release. Prior to 2001 a varying proportion of smolts were adipose clipped and CWTed.
Beginning with the 2001 adult return (2000 smolt release) 100% of all the hatchery coho are adipose clipped and CWT (snout). This marking scheme will occur at least through the 2002 smolt release. Prior to 2001 a varying proportion of smolts were adipose clipped and CWT

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc). Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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

167. Smoltjuveniles= No surpluses in the Program: All fish reared and acclimated to smolt phase are released.

163. None at this point in the program.

Comments:

nc
nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

10.9 Fish health certification procedures applied pre-release.

97. All fish are examined for the presence of "reportable pathogens" as defined in the PNFHPC disease control guidelines, within 3 weeks prior to release.

98. Fish transfers into the subbasin are inspected and accompanied by notifications as described in IHOT and PNFHPC guidelines.

Comments:

Per examination of USFWS pathologist.

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.

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

168. Pull screens and boards, and allow fish to exit the facility volitionally into Yakima and/or Naches Rivers.

Comments:

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.

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.

84. Fish are released at sizes similar to natural fish of the same life stage and species.

86. Volitional release during natural out-migration timing is practiced.

88. Fish are NOT released in a manner that simulates natural seasonal migration patterns.

89.

91. Fish are released at a time and size specified in an established juvenile production goal.

104. The percent of the naturally spawning population in the subbasin that consists of adults from the program is >30% (greater than thirty percent).

The percent of hatchery fish spawning in the wild is estimated by:

105.
- Annual stream surveys (e.g. carcasses)
- Escapement data from a weir or dam

95.

94. Fish are NOT released within the historic range for that stock.

93. The carrying capacity of the subbasin was taken into account when determining the number of fish to be released.

Comments:

text from Yakima River Coho HGMP:

Rearing and release strategies are designed to limit the amount of ecological interactions occurring between hatchery and naturally produced fish. Fish are reared to sufficient size such that smoltification occurs within nearly the entire population, which will reduce retention in the streams after release. Rearing on parent river water or acclimation for several weeks to parent river water is done to ensure homing to the stream reaches geographically adjacent to the acclimation sites. Following the experimental design, there is an early release on May 7th and a late release on May 28th . Releases are volitional from all four sites.
The releases do fall within the latter part of the natural outmigration window. Rearing and release strategies are designed to limit the amount of ecological interactions occurring between hatchery and naturally produced fish. Fish are reared to sufficient size such that smoltification occurs within nearly the entire population, which will reduce retention in the streams after release. Rearing on parent river water or acclimation for several weeks to parent river water is done to ensure homing to the stream reaches geographically adjacent to the acclimation sites. Following the experimental design, there is an early release on May 7th and a late release on May 28th . Releases are volitional from all four sites.
Fish are volitionally released over a two week period and forced out of the rearing units at the end of the two week period, during the latter part of the natural outmigration window.
nc
nc
nc
nc
nc
The program specifies release times and sizes for emigration of fish from the subbasin as smolted fish.

Stock is derivative of out of basin coho stocks that will be locally adapted to the subbasin.

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002. Hatchery and Genetic Management Plan, Coho Salmon, Little White Salmon/Willard NFH Complex, Little White Salmon River. 07 October 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
nds
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002.
Blodgett,J. APRE Part 2 Interview, 18 December 2002. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).
Blodgett,J. APRE Part 2 Interview, 18 December 2002.

Section 11. Monitoring and Evaluation of Performance Indicators

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

Plans and methods are generally setforth in the Yakima/Klickitat Fisheries Project relative to colecting data that is responsive to monitoring and evaluating program performance standards/indicators.

Specific program performance objectives as stated in the Planning Status Report (PSR) for the YKFP.

text from Yakima River Coho HGMP:

-Estimate annual life stage survival rates

- Egg-to-smolt: derived from adult counts, known fecundity rate and estimated smolt count past CJMF.

- Smolt-to-smolt (natural and hatchery): derived from PIT data analysis at CJMF and the lower Columbia mainstem dams.

- Smolt-to-adult (natural and hatchery): derived from, 1) PIT tag data and 2) estimated smolt divided into the Prossier adult counts.

144.

-Temporal and spatial spawning distribution: Radio telemeny study and selected foot surveys.

-Hatchery Experimental Design (location, release time, and stock): PIT tag and CWT data analysis from the eight treatment groups.

-Smolt Production: Monitored annually at CJMF.

-Adult Returns: Monitored annually at Prosser, Cowiche and Roza dams.

-Genetic monitoring of reverse domestication: Develop and implement a genetics monitoring plan.

-Predation on other species (NTTOC): Monitored through the YKFP indirect and direct predation studies.

-Other potential ecological interactions: Monitored through snorkel surveys in the upper Yakima and Naches rivers.

Comments:

nc

Data source:

Yakima Klickitat Planning Status Report. HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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

146. BPA Fish & Wildlife Program funding available for Yakima Fisheries Project M&E activities.

Comments:

nc

Data source:

Blodgett,J. APRE Part 2 Interview, 18 December 2002.

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.

147. nya

Comments:

nc

Data source:

nds

Section 12. Research

12.1 Objective or purpose.

169. All research is directed towards meeting Phase One feasibility needs. The focus is on evaluating the survival parameters of the hatchery releases. The study is designed to address survival differences between the Naches and upper Yakima subbasins, date of smolt release (early vs late) and stock effect (in basin vs out-of-basin). There are other YKFP projects that indirectly provide information to address reintroduction feasibility questions (i.e. indirect and direct predation studies, EDT modeling).

Comments:

nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

12.2 Cooperating and funding agencies.

170. The YN and WDFW conduct studies associated with the coho program. Bonneville Power Administration is the funding agency.

Comments:

nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

12.3 Principle investigator or project supervisor and staff.

171. Joe Blodgett, YN Hatchery Manager (for Yakima and Marion Drain), and

Jim Dunningan, YN Fisheries Biologist, principle M&E investigator.

Comments:

nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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

172. Yakima Basin Spring Chinook

Yakima Basin Fall Chinook

Yakima Basin Coho

Yakima Basin Steelhead Trout

Yakima Basin Resident Rainbow Trout

Yakima Basin Bull Trout

Comments:

nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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

173. A large portion of the M&E relies upon analysis of marks (PIT and CWT) to answer key feasibility questions. Monitoring for PIT tags is done at CJMF and at the lower Columbia River projects. Marks are also recovered in the broodstock collection, spawner surveys and the fisheries. Fish are enumerated as smolts at the CJMF and as adults at Prosser, Cowiche and Roza dams using video. Adults used in the telemetry study are drugged for insertion of the tag and bio-sampling.

Comments:

nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

12.6 Dates or time periods in which research activity occurs.

174. Smolt releases are made in the spring (May) and tagging activities associated with these releases occurs in the preceding fall or winter. Predation studies occur in the spring during the outmigration period. Reisidualism surveys occur in the summer period. The radio-telemetry study occurs in the fall with tagging at Prosser, and continues into early winter with the tracking phase.

Comments:

nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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

175. dna

Comments:

nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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

176. Coho are not being killed for research purposes, however, in 1998 and 1999 hatchery fish were collected for the direct predation study in the upper Yakima River. Steelhead adults intercepted at Prosser steep-pass ladder for the coho adult radio-telemetry study are passed directly back to the river (water-to-water transfer).

Comments:

nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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

Upper Yakima Spring Chinook

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

	Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	**Egg/Fry**	**Juvenile/Smolt**	**Adult**	**Carcass**	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Naches Spring Chinook-Natural

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

American River Spring Chinook-Natural

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Yakima Fall Chinook

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Marion Drain Fall Chinook

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Naches Coho

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Upper Yakima Coho

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya

Other take (specify) (h)	nya	nya	nya	nya

Upper Yakima Steelhead-Natural

181

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Satus Steelhead-Natural

181

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Toppenish Steelhead-Natural

181

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Naches Steelhead-Natural

181

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Yakima Summer Chinook-Natural

181

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg / Fry	Juvenile / Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag / mark / tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Bull Trout- Natural

181

ESU / Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Upper Yakima River Rainbow Trout-Natural

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Naches Rainbow Trout-Natural

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Lake Rainbow Trout-Hatchery

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Lakes Brown Trout-Hatchery

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	
Other take (specify) (h)	nya	nya	nya	nya	

Cutthroat-Natural

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)					
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harrass (a)	nya	nya	nya	nya	
Collect for transport (b)	nya	nya	nya	nya	
Capture, handle, and release (c)	nya	nya	nya	nya	
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya	
Removal (e.g., brookstock (e)	nya	nya	nya	nya	
Intentional lethal take (f)	nya	nya	nya	nya	
Unintentional lethal take (f)	nya	nya	nya	nya	

Other take (specify) (h)	nya	nya	nya	nya

Lake Cutthroat-Hatchery

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Kokanee-Hatchery

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Kokanee-Natural

181

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

182

Annual Take of Listed Fish by life Stage (number of fish)				
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Comments:

Potential for / estimates of injury or mortality, and methods to reduce either is minimal for both coho and other salmonids. No problems have been experienced to date with any field activities.

nc
nc

Data source:

Yakima River Coho HGMP
nds
nds

12.10 Alternative methods to achieve project objects.

177. None. This is the approved level of M&E agreed upon by the TWG to address all issues associated with coho reintroduction in the Yakima Basin.

Comments:

nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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

178. Yakima Basin Spring Chinook

Yakima Basin Fall Chinook

Yakima Basin Coho

Yakima Basin Steelhead Trout

Yakima Basin Resident Rainbow Trout

Potential take is minimal for both coho and other salmonids. No problems have been experienced to date with any field activities.

Comments:

nc

Data source:

HGMP Yakima Coho Reintroduction Feasibility Project (Yakima River Coho HGMP Word Doc).

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.

179. nya

Comments:

nc

Data source:

nds

Section 13. Attachments and Citations

13.1 Attachments and Citations

197. nya

Comments:

nc

Data source:

nds

Section 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

14.1 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. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered

Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973."

Name, Title, and Signature of Applicant:

Certified by_____ Date:_____