DOE F 1325.8 e Electronic Form Approved by CGIR - 01/20/95
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United States Government **Department of Energy**

Bonneville Power Administration

memorandum

DATE: April 23, 2001

REPLY TO ATTN OF: KEC-4

SUBJECT: Supplement Analysis for the Mid-Columbia Coho Reintroduction Feasibility Project (DOE/EA-1282-SA-01)

TO: Linda Hermeston
Project Manager – KEWL-4

Proposed Action: Mid-Columbia Coho Reintroduction Feasibility Project – Modifications to Original Proposal

Project No.: 199604000

Location: Chelan and Okanogan Counties, Washington

Proposed by: Bonneville Power Administration (BPA), Yakama Nation (YN) and Washington Department of Fish and Wildlife (WDFW).

Introduction: The Bonneville Power Administration prepared an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) on the proposed project in April of 1999. The project is an experiment to determine the feasibility of reintroducing coho salmon to the Mid-Columbia tributaries (Wenatchee, Methow, and possibly the Entiat) while keeping impacts to other weak but surviving fish populations to a minimum. Since the EA was prepared, the Technical Team, a group of biologists from State and Federal fish and wildlife management and regulatory agencies, helped the project to develop a detailed release program and additional research and monitoring of interactions with other fish species. As part of the release program, the team made suggestions for acclimation and release sites in the Wenatchee basin that were not evaluated in the EA, in an attempt to minimize impacts to other fish species. Also, capacity at Winthrop and Leavenworth National Fish hatcheries is limiting the number of eggs from returning coho that can be reared, so temporary incubation and rearing facilities are proposed at the Two Rivers site near Lake Wenatchee, in addition to the previously planned acclimation facilities. These changes are detailed in the attached report entitled, "Mid-Columbia Coho Reintroduction Feasibility Project Supplement Analysis." The purpose of this Supplement Analysis (SA) is to determine if a Supplemental EA is needed to analyze the environmental impacts of the proposed changes to the program since the Final EA and FONSI were completed.

Description of Action and Analysis: The proposed changes to the program and an analysis of their environmental impacts are described in the attached SA report.

Findings: As documented in this SA, the potential impacts from the proposed changes to the Mid-Columbia Coho Reintroduction Feasibility Project are not substantially different from those discussed in the Mid-Columbia Coho Reintroduction Feasibility Project EA (DOE/EA-1282), FONSI, and related biological assessments and draft biological opinion. No increased level of significance would occur relative to the impacts discussed in the original EA and FONSI in connection with these activities. There are no new circumstances or information relevant to environmental concerns that would change the significance of the proposed actions or their impacts. Therefore, a supplement to the Mid-Columbia Coho Reintroduction Feasibility Project EA and FONSI is not needed.

/s/ Nancy H. Weintraub
Nancy H. Weintraub
Environmental Project Lead – KEC

CONCUR: */s/ Thomas C. McKinney* DATE: *4/23/01*
Thomas C. McKinney
NEPA Compliance Officer

Documentation on file and pending:

Bonneville Power Administration. 2001. Biological Assessment for Mid-Columbia Coho Reintroduction Feasibility Project. February 2000.

United States Department of the Interior, Fish and Wildlife Service. 2001. Biological Opinion on the Mid-Columbia Coho Reintroduction Feasibility Project. U.S. Fish and Wildlife Service, Ephrata Field Office, Ephrata, WA. April 2001. **Pending**

Bonneville Power Administration, Yakama Nation, and Washington Department of Fish and Wildlife. 1999. Hatchery and Genetics Management Plan - Mid-Columbia Coho Reintroduction Program. December 1999.

National Marine Fisheries Service. 2001. Biological Opinion on Artificial Propagation in the Upper Columbia River Basin. National Marine Fisheries Service, Northwest Region, Portland, OR. **Pending**

United States Department of Energy, Bonneville Power Administration (USDOE/BPA). 1999. Mid-Columbia Coho Reintroduction Feasibility Project Final Environmental Assessment and Finding of No Significant Impact. DOE/EA-1282. Portland, OR. April 1999.

Attachment:
Mid-Columbia Coho Reintroduction Feasibility Project Supplement Analysis

Copies to: (w/attachment)
All who received EA/FONSI dated April 1999
Department of Energy/EH-42
T. Scribner, Yakama Nation
J. Foster, Washington Department of Fish and Wildlife

MID-COLUMBIA COHO REINTRODUCTION FEASIBILITY PROJECT
SUPPLEMENT ANALYSIS

DOE/EA-1282-SA-01

Bonneville Power Administration

March 2001

1. Introduction

The Bonneville Power Administration (BPA) is funding ongoing studies, research, and artificial production of coho salmon (*Oncorhynchus kisutch)* in the Wenatchee and Methow river basins, in the state of Washington. BPA analyzed environmental impacts of research projects in the Mid-Columbia Coho Reintroduction Feasibility Project Final Environmental Assessment (EA), completed in April 1999 (USDOE/BPA 1999). The purpose of this Supplement Analysis is to determine if a supplemental EA is needed to analyze additional research activities proposed as part of that project.

2. NEPA Analysis to Date

In spring of 1998, BPA determined that acclimation and release of coho smolts for research purposes at four sites in the Methow basin was categorically excluded from NEPA analysis. A comprehensive research program was proposed by fall of 1998. At that time, the Mid-Columbia Coho Reintroduction Feasibility Project EA (USDOE/BPA 1999) analyzed impacts of research to determine the feasibility of reintroducing naturally reproducing coho into the Methow and Wenatchee river basins, from which they have been extirpated. The EA focused on the impacts of construction of coho acclimation facilities, of coho smolt releases, of monitoring their survival and interactions with other species, and of operation and modification of existing production facilities needed to conduct the research.

The research is intended to help decision-makers determine if naturally reproducing coho can be successfully reintroduced in these basins without endangering the survival of other valued and at-risk populations of fish, such as spring chinook. By approximately 2004, the Yakama Nation, which is implementing the project, hopes to have adequate information on the potential for successful reintroduction of coho and their effects on other species to begin an in-depth analysis of whether and how to implement a full-scale reintroduction effort. Such an analysis would likely include, among other regional and regulatory processes, additional review and documentation under NEPA.

3. Description of the Proposed Action

Figure 1 shows the project location within the mid-Columbia region. The project collects broodstock; incubates eggs and rears fry at existing hatcheries; acclimates and releases smolts; and studies the natural production, ecological interactions, long-term fitness, and culturing/genetics of coho salmon. Since the EA was prepared, the Technical Team, a group of biologists from state and federal fish and wildlife management and regulatory agencies, helped the project to develop a detailed release program and additional research and monitoring of interactions with other species. As part of the release program, the team made suggestions for acclimation and release sites in the Wenatchee basin that were not evaluated in the EA, in an attempt to minimize impacts to other species. Also, capacity at Winthrop and Leavenworth National Fish hatcheries is limiting the number of eggs from returning coho that can be reared, so temporary incubation and rearing facilities are proposed at the Two Rivers site near Lake Wenatchee, in addition to the previously planned acclimation facilities. Rearing coho at Two Rivers could also help

answer questions about the project's overall feasibility by providing smolts with which to compare survival of coho raised in the basin to those reared elsewhere and transported to acclimation sites.

Several documents outline the project study designs as they evolved. The overall project study design was first outlined in the Mid-Columbia Coho Salmon Study Plan (YIN 1998). Effects of that plan were analyzed in the EA (USDOE/BPA 1999) and in Biological Assessments (BAs) submitted to U.S. Fish and Wildlife Service (USFWS) and to National Marine Fisheries Service (NMFS). The project was further refined in the Hatchery and Genetics Management Plan (HGMP) (YN et al. 1999), required by NMFS in its Biological Opinion.

Table 1 summarizes existing and proposed project activities. Differences from the EA are highlighted in yellow. Table 2 details the broodstock collection and smolt release plan, as developed for the HGMP (YN et al. 1999); yellow highlights show the differences from the original plan.

Figures 2 and 3 show existing and proposed project locations in each basin. However, the only change in the Methow basin from what was proposed in the EA involves fixed radio tracking sites near acclimation sites (see section 5.3.6); these tracking sites are not yet identified.

FIGURE 1 MID- COLUMBIA COHO SALMON STUDY - LOCATION MAP

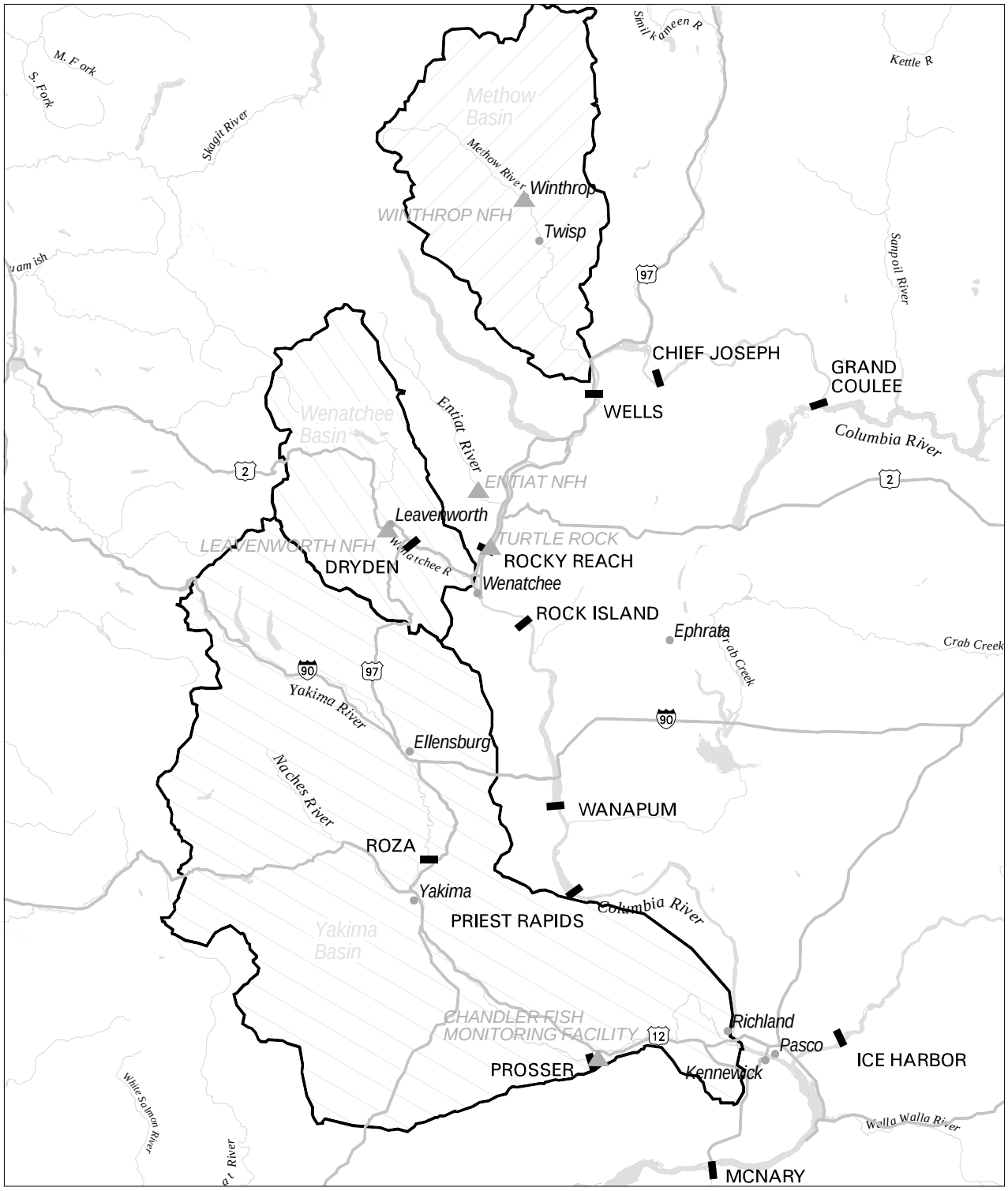


Table 1. Activities Required for Coho Project

Activity	Wenatchee	Methow	Purpose
Volitional smolt releases	Up to 1,000,000 annually (Apr 25–May 30)	Up to 250,000 annually (Apr 25-May 30)	All categories (section 2.0)
Acclimation	- Nason Creek (at Swamp and Butcher creeks) - Little Wenatchee and White Rivers (White River Side Channels* and Two Rivers) - Icicle Creek (Hatchery Side Channel and Coppernotch) - Beaver Creek* - Chumstick Creek, Eagle Creek - Brender Creek (not all sites would be used—sites with * subject to NMFS approval)	- Chewuch River (Eightmile Creek Ponds) – existing - Upper Methow River (Rockview Ditch) - existing - Wolf Creek (Biddle Ponds) – existing - Winthrop NFH - existing	All categories (section 2.0)
PIT tagging	Up to 16,000 smolts each year	9,000 smolts each year	Natural Production – survival
PIT tag detection	At existing facilities at Rocky Reach, McNary, John Day, and Bonneville dams	At existing facilities at Rocky Reach, McNary, John Day, and Bonneville dams	Natural Production – survival
Coded wire tagging	100% of released smolts beginning 2002.	100% of the local progeny beginning in 2001. 100% of released smolts beginning 2002.	Natural Production - survival Ecological Interactions - straying
Radio-telemetry	-Up to 100 returning adults at Priest Rapids, Tumwater or Dryden dams. -Up to 150 smolts in L. Wenatchee, 2001 & 2002.	Up to 100 returning adults at Wells Dam.	Natural Production – spawning distribution Ecological Interactions - predation
Radio tag detection	Fixed and mobile gear.	Fixed and mobile gear.	Natural Production – spawning distribution; Ecological Interactions - predation
Rotary trapping	-In lower Nason Cr. (RM 0.8), late Apr thru May (predation); March 15 – June 30 (natural production) -In lower Wenatchee (RM 7.1) Mar 15 - Jun 30 (WDFW trap). -On White & Little Wenatchee R at head of L. Wenatchee, Mar 1-Jun 30, 2002. -At Lake Wenatchee outlet (WDFW trap) (Apr 1–Jul 31).	None.	Ecological Interactions – direct predation, sockeye fry passage timing Natural Production - smolt production
Weir trapping	Near mouths of Beaver, Brender, Chumstick/Eagle cks, Mar 15 - Jun 30	None.	Natural Production - smolt production

Table 1 (continued)

Activity	Wenatchee	Methow	Purpose
Electro-fishing, beach seining	-Apr 25 – Jul 15 (alternatives if rotary trapping is unsuccessful) -Primarily early summer thru fall, though possibly year-round, near acclimation sites.	None.	Ecological Interactions – direct predation Natural Production - juvenile distribution and growth
Tow netting, mid-water trawls	In L. Wenatchee Apr 16-May 25, 2001 - 2003.	None.	Ecological Interactions - sockeye distribution, predation by coho
Fish measurements	-At Nason rotary trap, coho, non-listed spp., and spring chinook fry collected and measured. -At other rotary traps, all but listed species collected and measured.	None—no traps in this basin.	Ecological Interactions – direct predation
Stomach analysis	Up to 1,000 coho captured in rotary traps.	None.	Ecological Interactions—predation
Redd counts	Basin-wide, but concentrated near release areas, using rafts or walking in streams, weekly.	Basin-wide, but concentrated near release areas, using rafts or walking in streams, weekly.	Natural Production – spawning distribution
Redd capping	Up to 20 redds near Butcher, Beaver, Brender, or Chumstick/-Eagle acclimation sites, Feb-Apr.	None.	Natural Production - egg-fry survival
Artificial spawning channel	Existing facility at Cle Elum.	None.	Natural Production - egg-fry survival
Snorkeling	Spot checks near release areas & systematic samples (from 1 mi. above release site to mouth), spring thru fall.	Spot checks near release areas spring through fall	Natural Production - migration timing, residualism
Broodstock development	Use existing facilities – possibilities include: - Hatcheries - Winthrop, Leavenworth, or other appropriate Federal, State, PUD, private or Tribal facility; phase out use of lower Columbia hatcheries - Adult trapping – Tumwater, Dryden, and Wells dams; and at hatchery where adults return. Collect adults from several sites to ensure maximum genetic variability. - Adult holding – Same locations as "Hatcheries" above. Develop new facility for adult holding and spawning and for incubation/rearing at Two Rivers		
DNA analysis/-genetic monitoring	Experimental design to be determined – up to 240 coho would be fin-clipped or sacrificed for analysis and monitoring purposes.		

Table 2. Summary of Coho Releases and Broodstock Development

Methow

Winthrop Releases		
Smolt Release Year	Winthrop Release	Total
1998	341,000	341,000
1999	0	0
2000	200,000	200,000
2001	250,000	250,000
2002	250,000	250,000
2003	250,000	250,000
2004	250,000	250,000
2005	250,000	250,000

Smolts released in the Methow will be derived as stock transfers from the lower Columbia River coho hatcheries. All smolts will be released from the Winthrop Hatchery. All progeny derived from adults returning to the Methow will be released in natural production areas in the Wenatchee.

Winthrop Adult Returns			Adult Disposition		Expected Smolt Production from Methow Returns				
Adult Return Year	Adult Return	Prespawn Mortality	Broodstock	Natural Spawning*	Females	Spawning Year	Eggs	Smolts	Outplant Year
1999	0	0	0	0	0	1999	204,000	0	2001
2000	0	0	0	0	0	2000	0	0	2002
2001	0	0	0	0	0	2001	0	0	2003
2002	0	0	0	0	0	2002	0	0	2004
2003	0	0	0	0	0	2003	0	0	2005
2004	0	0	0	0	0	2004	0	0	2006
2005	0	0	0	0	0	2005	0	0	2007

Methow Assumptions					
SAR	Fecundity	Egg:Smolt	Female Ratio	Capture Efficiency	Prespawn Mortality
0.0005	2,750	0.85	0.5	0.5	0.15

Wenatchee

Wenatchee Releases**							
Smolt Release Year	Butcher Creek	Beaver Creek	Two Rivers	Chumstick Creek	Brender Creek	Leavenworth	Total
1999	75,000					450,000	525,000
2000	75,000					925,000	1,000,000
2001	147,000					853,000	1,000,000
2002	120,000	100,000	15,000	101,476		663,524	1,000,000
2003	120,000	-160,000	-160,000	100,000	100,000	1,000,000	1,000,000
2004	120,000	-160,000	-160,000	100,000	100,000	1,000,000	1,000,000
2005	120,000	-137,599	-137,599	100,000	55,198	1,000,000	1,000,000

Wenatchee Adult Returns			Adult Disposition		Expected Smolt Production from Adult Returns				
Adult Return Year	Adult Return	Prespawn Mortality	Broodstock	Natural Spawning***	Females	Spawning Year	Eggs	Smolts	Outplant Year
2000	539	81	0	0	0	2000	0	0	2002
2001	1,027	154	0	0	0	2001	0	0	2003
2002	1,027	154	0	0	0	2002	0	0	2004
2003	1,027	154	0	0	0	2003	0	0	2005
2004	1,027	154	0	0	0	2004	0	0	2006
2005	1,027	154	0	0	0	2005	0	0	2007

Wenatchee Assumptions					
SAR	Fecundity	Egg:Smolt	Female Ratio	Capture Efficiency	Prespawn Mortality
0.0010273	2,750	0.85	0.50	0.6	0.15

Source of Wenatchee Outplants				
Smolt Release Year	Lower River	Wenatchee Production	Methow Production	Total
1999	1,000,000	0	0	1,000,000
2000	1,000,000	0	0	1,000,000
2001	1,000,000	0	0	1,000,000
2002	1,000,000	0	0	1,000,000
2003	1,000,000	0	0	1,000,000
2004	1,000,000	0	0	1,000,000
2005	1,000,000	0	0	1,000,000

* This natural spawning is predicted as a result of capture efficiency at Wells and straying.

** In the Wenatchee basin, smolts released into natural habitat will be progeny of adults returning to the Wenatchee and Methow rivers. Smolts derived from stock transfers from Lower Columbia River hatcheries that are released in the Wenatchee will be released solely from Leavenworth Side Channel.

*** This natural spawning is predicted primarily in Chumstick and Brender creeks, due to their location downstream of adult traps, but even those sites have limited habitat.

Explanation of Assumptions in Table 2:

1. Estimated SAR used is the median between Yakima River and Methow River smolt-to-adult survival data.
2. Fecundity is Yakima River broodstock data for 1998 and 1999.
3. Egg-to-smolt survival is based on personal conversations with Lower Columbia River coho hatchery managers. The 1998 brood Yakima River coho experienced high losses due to water quality problems and therefore were not used in the calculations.
4. Female ratio is an average from both the Methow 1999 returns and 1998/1999 Yakima River returns.
5. Straying and trap operations are the main factors in estimating less than 100% capture efficiency.
6. Pre-spawn mortality estimates are from personal communication with Lower Columbia River hatchery managers.

Figure 2
Wenatchee River Subbasin

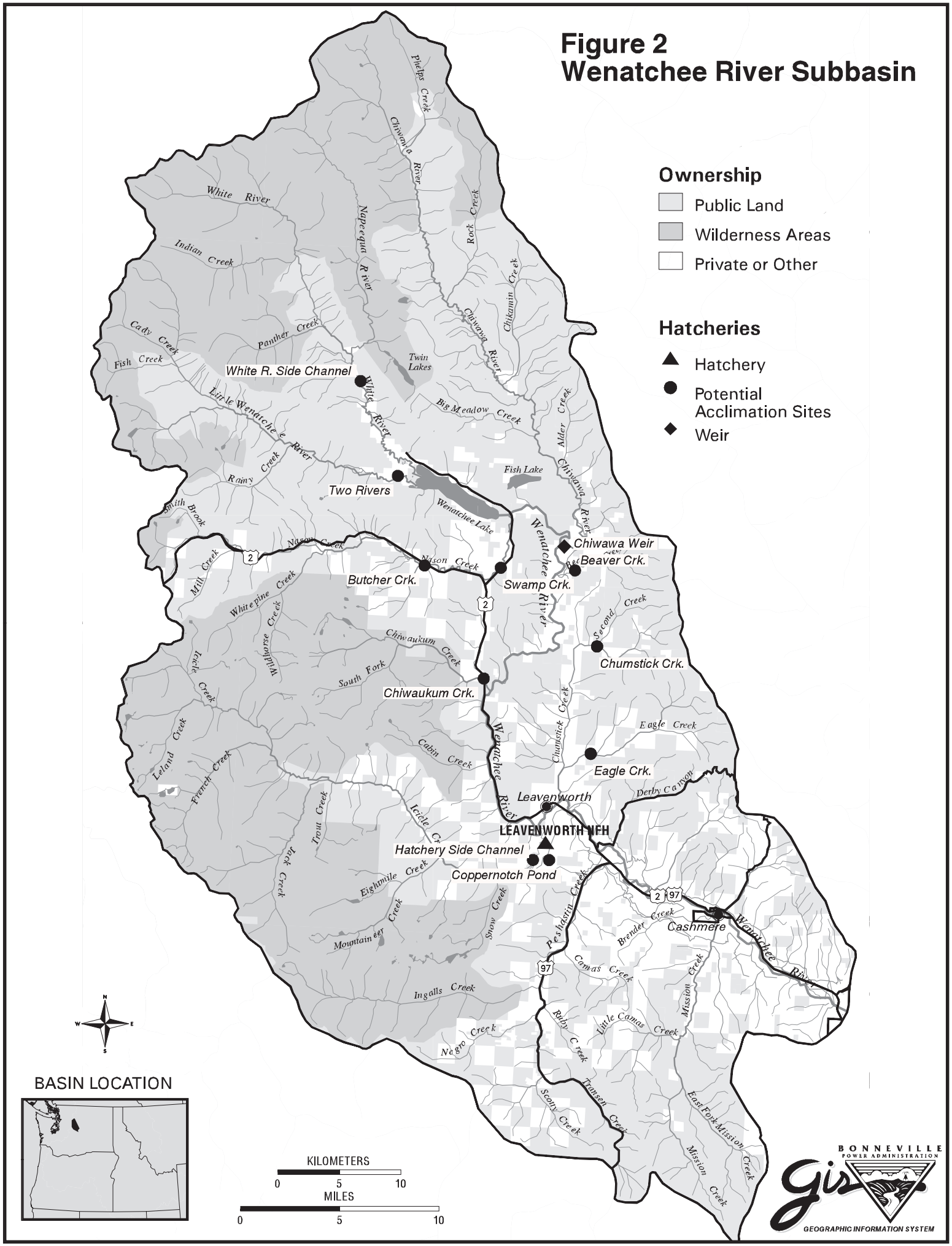
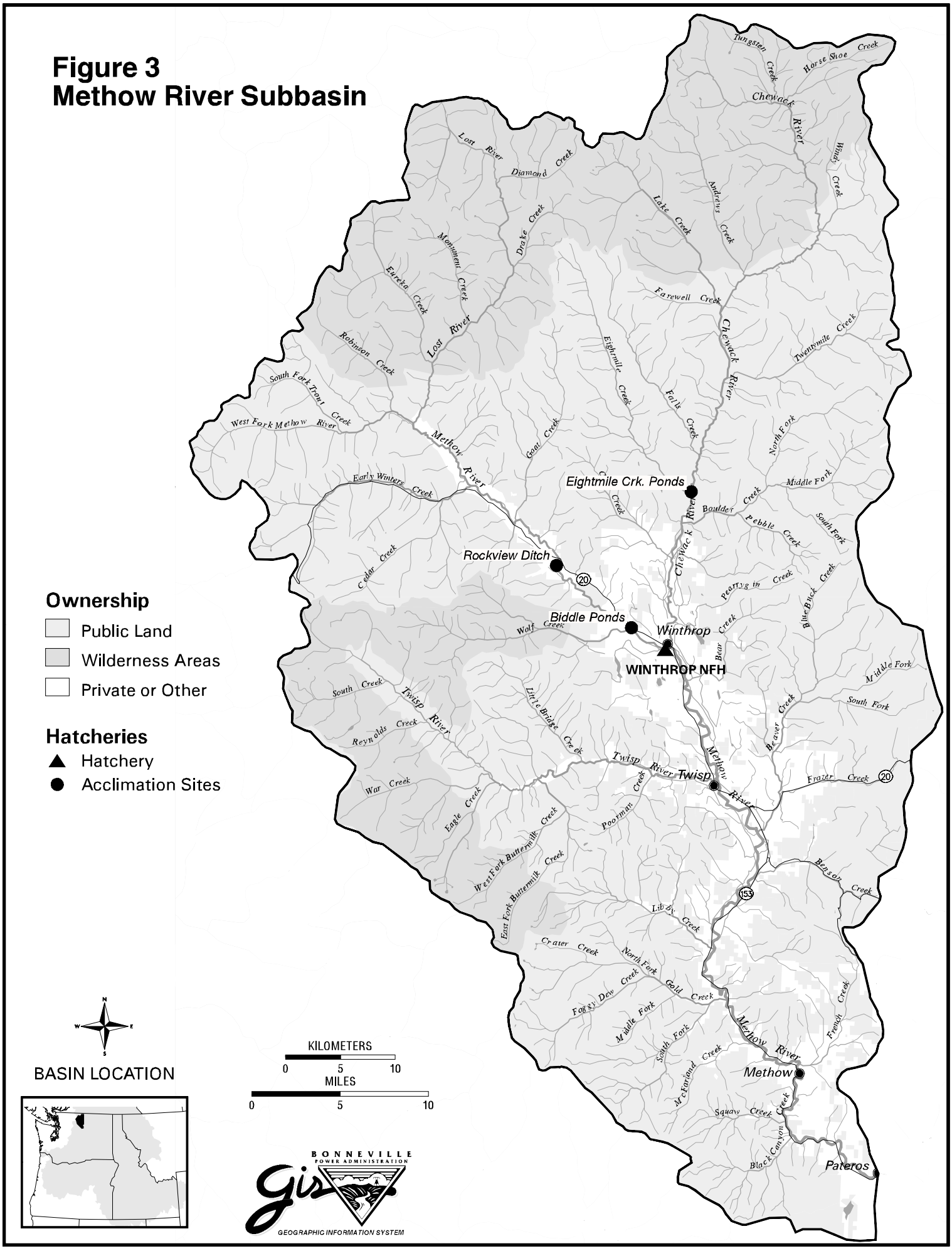


Figure 3
Methow River Subbasin



4. New Activities and Circumstances Since Earlier NEPA Documents

Yellow-highlighted material in tables 1 and 2 show differences in the proposed activities from those evaluated in the EA. In some cases, the activity was evaluated, but the project proposes to change its location or frequency. In other cases, the project proposes to change the number of fish used or collected for research. New or expanded facilities have also been proposed. The following paragraphs detail those differences.

- New coho acclimation sites in the Wenatchee basin at Brender Creek, on the Chumstick system at Chumstick or Eagle creeks, and at Coppernotch Pond near Leavenworth Hatchery are proposed in response to concerns that some sites evaluated in the EA could pose unacceptable risks to listed fish species. In addition, the potential for dredging the Beaver Creek pond was not anticipated in the EA.
- Additional equipment for incubation and rearing of coho smolts is proposed at the Two Rivers site, which was evaluated in the EA for acclimation purposes. The EA proposed that existing hatchery facilities be used for incubation and rearing. However, coho have been returning to the Wenatchee basin in unexpectedly high numbers, and capacity at existing hatcheries is inadequate to rear the eggs collected from these fish. To avoid losing the genetic material represented in these gametes (which might include characteristics that allowed the fish to successfully migrate the longer distances than their lower river ancestors), the project proposes to install temporary incubation and rearing facilities at the Two Rivers site. Differences in survival between fish reared in-basin and those reared outside the region could also be studied. The additional incubation/rearing facilities were not assessed in the EA.
- A study to evaluate interactions between coho and sockeye in Lake Wenatchee, which was anticipated in the EA, has been developed in detail. The study proposes tow-net or mid-water trawl collection methods and additional radio telemetry tracking not evaluated in the EA.
- Additional snorkeling, beach seining, and electro-fishing to monitor smolt distribution and growth are proposed. Effects of these activities were evaluated in the EA; only their frequency and locations have increased.
- Additional rotary trapping and new weir trapping are proposed. Effects of rotary trapping were evaluated in the EA, but not at all the sites currently proposed. Weir trapping effects were not evaluated.
- PIT-tagging and radio tagging of more coho smolts than originally expected, and coded-wire tagging of all smolts, is now proposed.
- Use of an artificial spawning channel in the Yakima basin or redd capping is proposed. These activities were not evaluated in the EA.
- BPA also recognized that additional environmental analysis could be needed if environmental circumstances changed—for example, if additional species were listed under the Endangered Species Act (ESA). Additional plant and animal species have been listed under the ESA; the Wenatchee checker-mallow, listed as endangered, and the Canada lynx, listed as threatened.

5. Effects of Project Activities Not Previously Evaluated

The following sections discuss effects of activities and facilities not previously evaluated.

Table 3. Recorded Sightings of Listed Species Within 5 Miles of Coho Rearing and Acclimation/Release Sites*

Species	Sites					
	Two Rivers	**Chumstic k Creek**	**Eagle Creek**	**Copper-notch Pond**	**Beaver Creek**	**Brender Creek**
Spring chinook (E)**	Rearing/-migration w/in 1 mi. in Little Wenatchee			Rearing/-migration w/in 1 mi.	Potential rearing w/in 1 mi. in Wenat-chee R.***	Parr (in lower 1/4 mi.)****
Steelhead (E)	Spawning/-rear/migra-tion w/in 1 mi. in Little Wenatchee	Spawning/ -rearing	Spawn-/rear	Migration habitat w/in 1 mi.	Migration; potential rearing w/in 1 mi. in Wenat-chee R.***	In lower 1/4 mi.****
Bull trout (T)	Migration/-rearing w/in 1 mile in Lake Wenatchee and Little Wenatchee			Migration w/in 1 mile in Icicle River.	Potential migration w/in 1 mi in Wenatchee River	
Bald eagle (T)	0-1 mi.			1-2 mi.		4-5 mi.
N. spotted owl (T)		W/in 2 mi.			W/in 2 mi.	W/in 2 mi.
N. spotted owl CHU*****	3 CHUs w/in 3-5 mi.	2 CHUs w/in 2-3 mi.	W/in 4 mi.	2 CHUs w/in 1-3 mi.	2 CHUs w/in 1-4 mi.	1 CHU w/in 4 mi.
Gray wolf (E)	1-2 mi.					
Grizzly bear (T)				2-3 mi.		
Canada lynx (T)		4-5 mi.				
Wenatchee checker-mallow (E)				1-2 mi.		Less than 1 mi.
Ute ladies'-tresses (T)						

* Source unless otherwise noted: WDFW 2000a and WDFW 2000b.
** E = "Endangered," T = "Threatened," as defined in Endangered Species Act (ESA).
*** Source: Tom Scribner, YN, personal communication, 4/2/01.
**** Source: Joe Foster, WDFW, personal communication, 2/14/01.
***** CHU = "Critical Habitat Unit."

Sockeye salmon inhabit Lake Wenatchee and spawn and rear in the Little Wenatchee River within a mile of the proposed Two Rivers acclimation site. Although not listed under ESA, they are considered a species of concern because they are one of only two populations remaining in the Columbia River system (Ken MacDonald, USFS, personal communication, 1999).

5.1 Effects of proposed new incubation and rearing facilities at Two Rivers

This site, on the Little Wenatchee River near where it enters Lake Wenatchee, is on the property of an operating sand and gravel mine (Two Rivers Sand and Gravel) (SW 1/4 of Section 15, T27N, R16E). Figure 4 shows the location of the site in relation to the gravel mine and rivers, and Figure 5 shows proposed plans for this site. Proposed facilities include two earthen rearing/acclimation ponds, two metal raceways, a small incubation building with a cement foundation, a portable generator and backup to supply power to the site, and a settling pond. Water supply will be from the existing sump but could require back-up from either an additional new infiltration gallery[1] or from the pond that was excavated for the gravel operation. Tests will be done in spring of 2001 to confirm water quality and supply. Ideally, this site would be used for adult holding/spawning, incubation, and rearing beginning in fall 2001; and for acclimation in spring 2002, beginning with 5,000 - 15,000 coho for the sockeye study.

The footprint of the facility would be slightly larger than that anticipated in the EA, but since it is located in an excavated gravel pit, no additional impacts from the construction of the additional facilities are anticipated. The rearing/acclimation ponds would be excavated using a bulldozer and backhoe and would be lined with plastic. A new infiltration gallery might also be dug if the existing sump does not produce enough water. Water would be pumped from the existing excavation lake to supply the ponds, requiring that a trench be dug from the excavation lake to the ponds and pipe laid. Other minor ground disturbance could be required for the building site and the raceways.

An existing channel up to 600 meters (2000 feet) long and 3.3 meters (10 feet) wide from the ponds to the Little Wenatchee River will be used to provide an exit for the smolts. Within the current pit boundary (see Figure 4), the channel is an open ditch, which the gravel company would replace with a concrete box culvert from the ponds to the pit boundary. From there to the Little Wenatchee River, it is expected that improvements would be limited to removing brush and placing rock to stabilize the banks. This work would be done in summer, when, currently, water flow in the channel is low. As stated in the EA, a temporary coffer dam using sandbags would be used at the outlet to the river to prevent sediment from entering the river. The site would be designed so runoff from the site after construction would not enter the channel. There are no large hills of gravel or dirt immediately adjacent to the proposed pond site at Two Rivers, and a berm protects the river from the excavation site. Therefore, sediment levels in the Little Wenatchee River are expected to increase minimally, if at all.

[1] An infiltration gallery is a trench dug to groundwater level. Pipe is laid in the depression and the area is back-filled with gravel.

Figure 4. Two Rivers acclimation site.

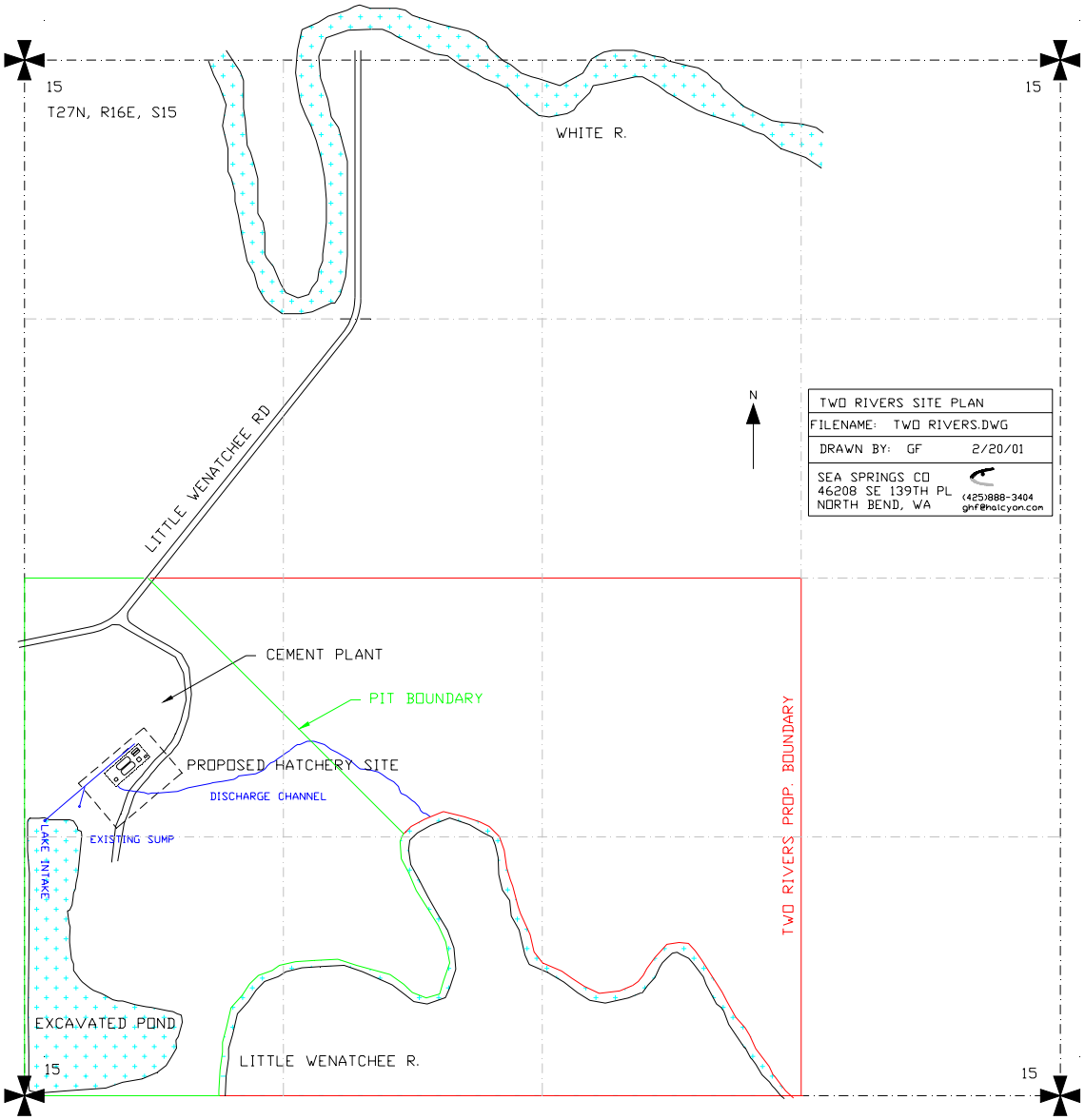
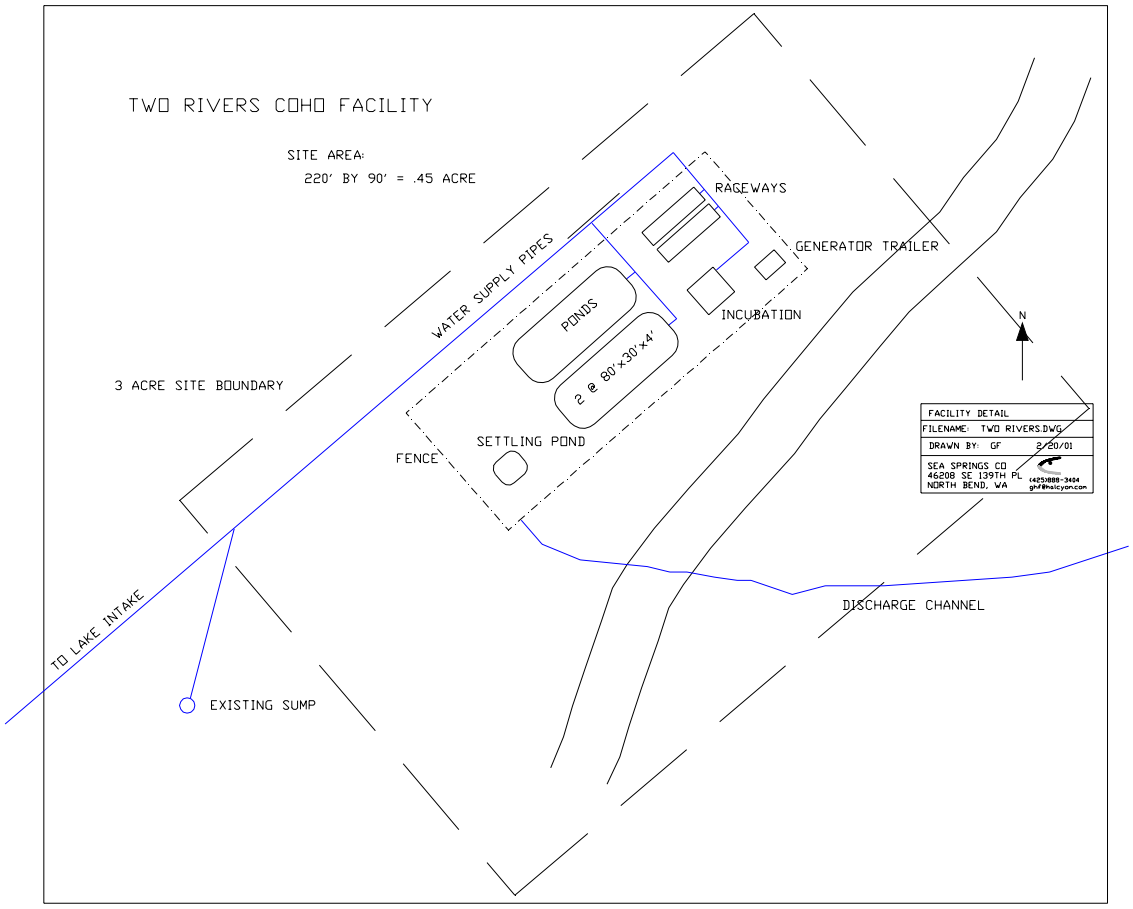


Figure 5. Two Rivers site plan.



The hatchery site is a minimum of 0.6 meters (two feet) above the 100-year floodplain elevation (Greg Ferguson, personal communication, April 12, 2001), but the channel is not, and the channel probably also is in a wetland, as was stated in the EA and FONSI. Detailed surveys will be done to confirm floodplain and wetland locations. The incubation and rearing facilities would not raise the expected level of the 100-year flood and would include use of impervious surfaces only for the incubation building's 36-m^2 (400-ft^2) concrete pad and the lined rearing ponds. Because the proposed site is above the 100-year floodplain level, the floodplain should not be affected.

The sand and gravel company's operating permit does not allow disturbance within 76 m (250 ft) of the river. Depending on the extent of improvements needed to stabilize the existing discharge channel (currently anticipated to be removal of brush and placement of rock to stabilize the banks), permits to work in wetlands, streambeds, and shoreline areas could be required, as indicated in the EA (sections 3.4.1.3, 4.4.1, and 4.7), and would be coordinated using the State of Washington's Joint Aquatic Resource Permits Application (JARPA) process. As part of that process, Chelan County authorities would be contacted to ensure that the construction would not alter floodplain or floodway characteristics or channel flow capacity. Certain design restrictions or limitations could apply.

As stated in the EA, before designs are finalized, specific wetland locations would be delineated. If wetlands are found, a Section 404 Permit from the U.S. Army Corps of Engineers (Corps) could be required. Review and concurrence would be handled through the JARPA process. Information from delineation surveys would be used during final design to develop mitigation measures, if necessary, to ensure that the project would result in no net loss of wetlands. The following measures would be taken to assure minimal impacts to wetlands.

- Disturbance of wetlands would be avoided whenever possible.
- If disturbance could not be avoided, the area of disturbance would be minimized to the extent practicable. Buffers from construction activities would be provided.
- In shoreline areas, disturbed land would be restored as closely as possible to pre-project contours and replanted with native and local species. However, site topography could require riverbank disruption. A restoration and monitoring plan would be prepared before shoreline areas were disturbed.
- Erosion control measures would be implemented within the 60-m (200-ft.) State Shoreline area (see section 4.4.2 in the EA).

The potential impact to wetland and floodplains from the channel construction would be less than that anticipated in the EA and FONSI, since at that time we anticipated that an entire new 250-foot outlet channel would need to be constructed. In subsequent discussions with the landowners, we determined that a channel exists; however, brush clearing and bank reinforcement with rock may be needed along the 250-foot length to accommodate the increased flows. A portion of this area is within a 100-year floodplain and may be designated riparian wetland, but the overall impact to floodplains and wetlands would be less than that addressed in the EA and FONSI.Coho predation on sockeye would be monitored as part of the sockeye study planned for Lake Wenatchee in 2001 – 2003 (see section 5.3.5).

If study results indicate the potential for unacceptable levels of coho predation on juvenile sockeye, coho releases in this area will be modified or discontinued. As stated in the EA and FONSI, in the unlikely event that the site is flooded, the premature release of hatchery reared coho could slightly increase the potential for coho predation on sockeye rearing downstream in Lake Wenatchee. However, any coho that escape from the proposed facility during a flood would likely be moved through the lake quickly in the high water.

The Washington Salmonid Stock Inventory (WDFW 1998) indicates that bull trout spawn in the upper tributaries of both the Wenatchee and Methow basin, in most of the tributaries where the project activities would take place. It also indicates that they use Lake Wenatchee for rearing, although Washington Department of Fish and Wildlife's (WDFW) Streamnet Database (WDFW 2000a) does not indicate bull trout use within 5 miles of Two Rivers, which is just upstream of Lake Wenatchee. Little competitive interaction is expected between juvenile bull trout and coho smolts released at Two Rivers. Bull trout spawn timing in this area is most likely similar to general patterns observed for the species, is related to water temperature, and generally occurs from September to October (Pratt 1992). The geographic overlap of the spawning and juvenile bull trout rearing habitat and the coho migratory path would be minimal for coho releases because the majority of juvenile bull trout rearing habitat occurs well upstream of the proposed coho site. Since coho to be released would be relatively small (approximately 20 fish/pound) and would out-migrate quickly, and since juvenile bull trout rear in the upper reaches, there appears to be little chance for interactions between them and coho.

The project does have the potential to affect migratory adult bull trout, however, from minor temporary increases in sediment levels in the Little Wenatchee River. As described above, erosion control best management practices are expected to keep such effects to a minimum. Potential impacts to bull trout from sedimentation are less than those anticipated in the EA and FONSI because a new channel will not be required.

Potential impacts to other listed species are similar or less than those anticipated in the EA and FONSI.

Two bald eagle nest sites, used by the same pair of birds, are located within a mile or less of the Two Rivers acclimation site in the Wenatchee basin (WDFW 2000a; Heather Murphy, USFS, personal communication, February 2001). The only trees that might be cut at Two Rivers are a few deciduous trees about 10 meters (30 feet) tall, too small for eagle nesting or perching. Therefore, there would be no impact to bald eagle habitat. It is also unlikely that the construction or rearing and acclimation activities at the site, including the generator, would disturb nesting bald eagles, since the quarry at the site is and has been actively mined with heavy equipment for many years.

There is one recorded sighting of a wolf within 1.6 – 3.2 kilometers (1 - 2 miles) of the Two Rivers acclimation site (in 1988, WDFW 2000b) and other unconfirmed sightings of gray wolves, but the Wenatchee NF reports that there are no known resident populations on the forest (USFS 1990). The Two Rivers site is a relatively high traffic area, with the gravel operation and vacation homes nearby. Since there are no known denning sites in the area, and the project would not involve modification of habitat for the wolf or its prey, the project would not adversely affect the gray wolf.

Two listed plants have the potential to be found at this and other acclimation sites. Ute ladies'-tresses are found in mesic to wet meadows, wetland and riparian areas, river meanders, and floodplains, and they have been found in man-made wetland habitats such as borrow pits. The plant occurs below the lower margin of montane forests, generally in the transitional zone between mountains and plains. Surrounding vegetation is usually sparse; woody species may be described as "scraggly" (USFWS letter dated January 17, 2001). Although it has been found in the Okanogan River basin in a similar climate zone to those in the Methow and Wenatchee basins, its presence has not been confirmed on either forest. The Wenatchee checkermallow is found in the Leavenworth Ranger District of the WNF in dry forest and moist meadows, and at stream margins generally within ponderosa pine forest. It is associated with Wenatchee larkspur (*Delphinium viridescens*)--a USFS species of concern--and quaking aspen in moister sites. The Two Rivers site will be surveyed for the presence of these plants before ground disturbing work begins. If they are found, the site will be redesigned to avoid impacts. If that proves impossible, the activity will be relocated to another site. Therefore, the listed plants are not expected to be affected.

To use the Two Rivers site for incubation and rearing would require a reliable power supply. The need for power to run a pump to supply water for acclimation ponds was anticipated in the EA, but specific sources were not evaluated. YN staff subsequently investigated use of fuel cells, but found that they are considered unreliable. The preferred solution is to supply power from either a diesel or a propane generator that would be mounted on a trailer. (A permanent power supply is not cost-effective for a temporary site.) Air quality permits will be required and obtained. Generator fuel tanks will be installed in spill protection containers. All Washington Department of Ecology regulations, including requirements for spill protection plans, will be followed. Noise from operation of the generator and pump would not be greater than that from the sand and gravel operation itself. However, the hatchery noise will occur on weekends, whereas the industrial site shuts down, so weekend visitors in the area might notice a change from current conditions. We do not believe this impact would be significant, as the noise will not exceed Washington State noise standards, which are set at levels to prevent significant impacts.

It is possible that industrial substances, such as oil from the gravel operation, have been spilled at this site. Before it is leased from Two Rivers Sand and Gravel, BPA would conduct a Level I hazardous materials survey. If such materials are found, cleanup options, alternate locations on the property, or another site would need to be considered.

A National Pollution Discharge Elimination System (NPDES) permit would be required when net production exceeds 20,000 pounds, which is anticipated to occur in summer of 2002. Pollution impacts from the facility would be increased somewhat from the original proposal due to the increased numbers of fish that will be held on site. Impacts will not be significant, however, because discharges will be treated to remove or minimize wastes. Water rights would be obtained.

Because the pond site has been disturbed already, cultural resources are unlikely to be affected. A cultural resources survey on the channel area would be done before ground-disturbing work takes place. If cultural resources are found during the survey or during

construction, procedures set forth in relevant regulations and guidelines would be followed (see section 3.4.1.1 and 4.6 of the EA).

If this site cannot be re-designed to avoid environmental problems, including impacts to listed species, alternatives include those discussed in the EA: broodstock holding at Chiwawa, incubation and rearing at Lower Columbia River hatcheries, and acclimation at the other sites.

5.2 Effects of proposed acclimation sites

5.2.1 Beaver Creek

While effects of use of this site were evaluated in the EA, YN proposes additional ground disturbing work that was not anticipated in the EA. Coho would be acclimated in an existing, privately owned pond adjacent to a tributary to the Wenatchee River. It is approximately 0.4 km (0.25 mi.) northeast of Plain, just off of Highway 209 and just south of the confluence of the Chiwawa and Wenatchee Rivers. The pond is man-made, with a diversion from Beaver Creek and a culvert discharge back to the creek. For the first acclimation planned from this site in 2002 (100,000 smolts), the only work required would be repairs to the existing water intake and discharge screens. Current plans are that in 2003 the planned coho numbers increase to 171,000, although capacity for higher numbers of coho could be required in 2002. To accommodate those numbers, about 150 cubic yards of material would need to be dredged from the pond. Additional temporary water rights might be needed.

Water flow to the pond would be stopped and the pond drained prior to any dredging, so there would be little if any increase in sediment downstream in Beaver Creek, and consequently, little or no potential to impact fish.

This site is likely in a 100-year floodplain and/or wetlands. Dredged materials would be disposed at an upland site above the 100-year floodplain, so the floodplain would not be affected. As described in section 5.1 for the Two Rivers site, reviews and permits using Washington's JARPA process will be obtained before work is done. Also as described in section 5.1, plant and cultural resources surveys will be completed before disturbing the ground, and effects would be avoided or mitigated, as necessary.

The database indicates that Beaver Creek is migratory habitat for summer-run steelhead, and WDFW recently reported that staff have found some steelhead in the area. Other sources suggest that these fish are rainbow trout. Presence or absence of steelhead will be confirmed in 2001, as required in NMFS' Draft Biological Opinion on the Upper Columbia River Artificial Propagation Program (dated December 1, 2000). As of March 2001, YN's initial weekly survey found only two potential steelhead (which could also have been rainbow trout), at the mouth of Beaver Creek. No steelhead were found upstream (T. Scribner, YN, personal communication, March 26, 2001). If steelhead are found, the NMFS draft opinion requires BPA and YN to determine the potential for effect on listed steelhead of coho releases in this area, before this site can be used.

As stated in the EA, coho smolt predation on steelhead is not expected because steelhead emerge from gravel after coho have migrated downstream (DOE/BPA 1999, p. 34). Studies of competition risks are inconclusive (DOE/BPA 1999, p. 38). A recent study of the effect of coho smolt releases on abundance of steelhead/rainbow and cutthroat trout in

the Yakima basin indicate that coho releases do not affect abundance, although the researcher acknowledged the study's limitations due to its lack of statistical power and suggested further controlled experiments (Dunnigan 1999). At this point in the feasibility studies, most, if not all, fish that would be homing to the Beaver Creek area would be trapped at Dryden or Leavenworth Dam 5, so little if any natural production would occur at Beaver Creek. Thus, competition between coho and other species would be limited or non-existent.

5.2.2 Coppernotch Pond

Figure 6 shows the proposed site design at Coppernotch Pond near Leavenworth hatchery on Icicle Creek. The EA evaluated the effects of using two existing sites at the hatchery. In 1999, the existing pond on the hatchery grounds was used. In 2000, the side channel was used. However, controversy continues over coho use of those two sites. In addition, in its draft Biological Opinion on the Upper Columbia River Artificial Propagation Program, NMFS says: "BPA and YIN [sic] should explore options [to the old Icicle Channel] for acclimation of coho in Icicle Creek beyond 2000." One option is the use of Coppernotch Pond. The project proposes to use the side channel again in 2001. In 2002, both the side channel and possibly Coppernotch Pond would be used for acclimation.

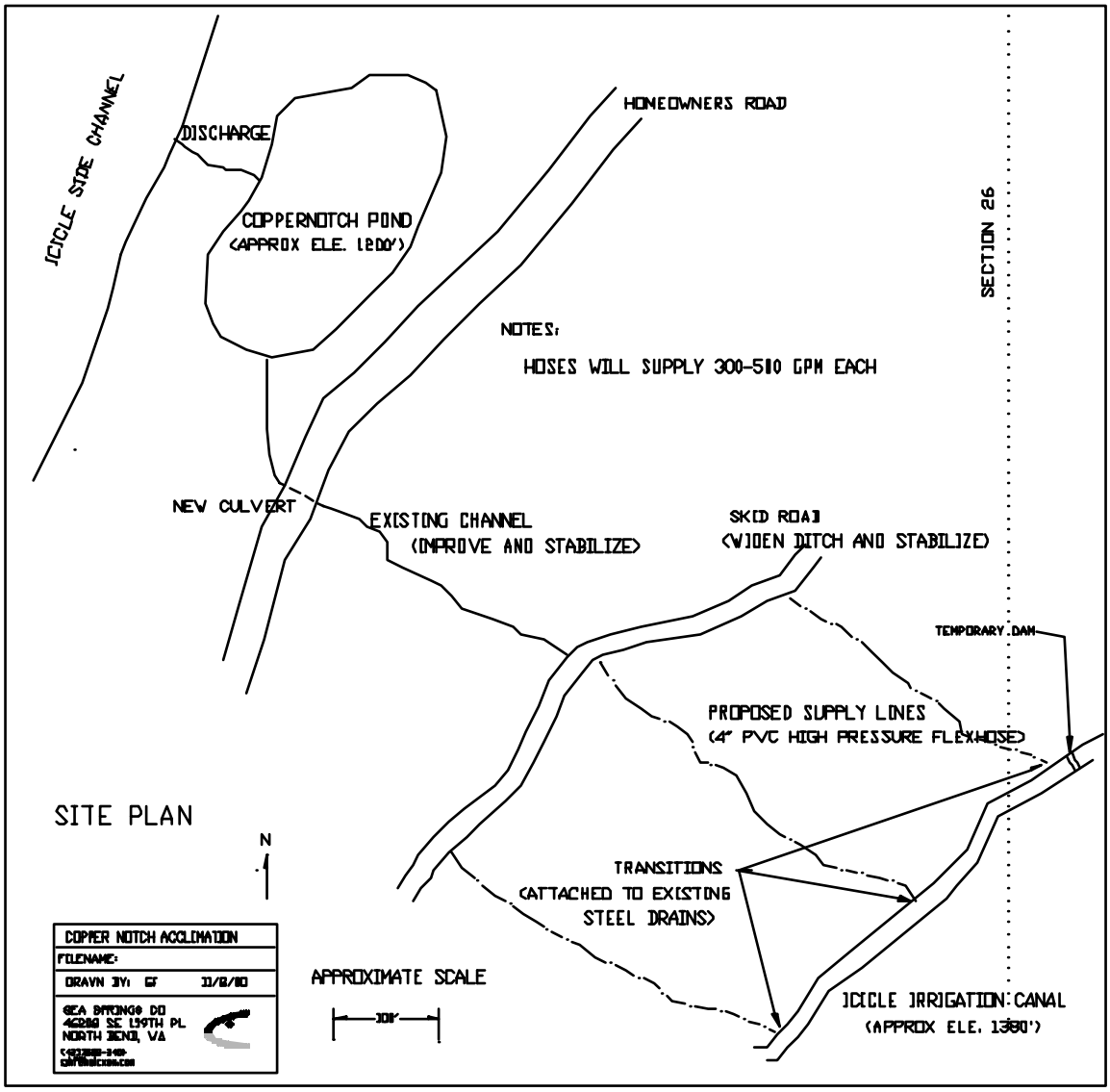
Coppernotch Pond is privately owned. An existing outlet, approximately 75 feet long, flows into the hatchery side channel. Only clearing brush from the outlet would be required to allow acclimated fish to reach the side channel. Three to six cfs of water would have to be diverted to the pond from the Icicle Irrigation Canal during acclimation. The water would be taken out of the canal using existing pipes through the canal wall and channeled into existing run-off gullies that feed the pond. These gullies would need to be excavated and rocked, and a culvert would need to be replaced. Project managers are working with landowners to obtain permission to use the pond and with Washington Department of Ecology to obtain temporary water rights.

Soil disturbing work would take place too far from Icicle Creek to increase sediment levels. Although the site is within 1.6 km (1 mi) of one northern spotted owl Critical Habitat Unit, activity associated with development and operation of the site is not expected to disturb owls any more than do the existing hatchery and residences in the area.

The Coppernotch Pond is within 1.6 – 3.2 km (1 - 2 mi) of a newly identified eagle winter roosting site (Heather Murphy, USFS, personal communication, Mar. 5, 2001). Development of Coppernotch Pond would occur in the summer and early fall, so wintering eagles are unlikely to be in the area. While activities that would occur at the site to acclimate fish might overlap slightly with eagle wintering (fish are moved to the ponds in late March), the site is far enough from the roosting area that the limited activity is unlikely to disturb wintering eagles that might still be in the area.

Grizzly bears were once found in the upper reaches of the Wenatchee basin but now are only occasionally seen. There are no known den sites on the forest (USFS 1990). There is one recorded sighting, in 1991, of grizzly bear tracks within 3 – 5 km (2 - 3 mi) of the Leavenworth Hatchery/Coppernotch Pond area (WDFW 200b). However, because Coppernotch Pond is adjacent to residences and the existing hatchery, development is unlikely to disturb the bears or their habitat.

Figure 6. Acclimation site at Coppernotch Pond.


ICICLE SIDE CHANNEL
DISCHARGE
COPPERNOTCH POND
(APPROX ELE. 1200')
HOMEOWNERS ROAD
SECTION 26
NOTES:
HOSES WILL SUPPLY 300-500 GPM EACH
NEW CULVERT
EXISTING CHANNEL
(IMPROVE AND STABILIZE)
SKID ROAD
(WIDEN DITCH AND STABILIZE)
TEMPORARY DAM
PROPOSED SUPPLY LINES
(4" PVC HIGH PRESSURE FLEXHOSE)
SITE PLAN
N
TRANSITIONS
(ATTACHED TO EXISTING
STEEL DRAINS)
COPPER NOTCH ACCLIMATION
FILENAME:
DRAWN BY: GF
11/8/00
SEA BARONGO DO
4528 SE 139TH PL
NORTH BEND, WA
APPROXIMATE SCALE
100'
ICICLE IRRIGATION CANAL
(APPROX ELE. 1380')

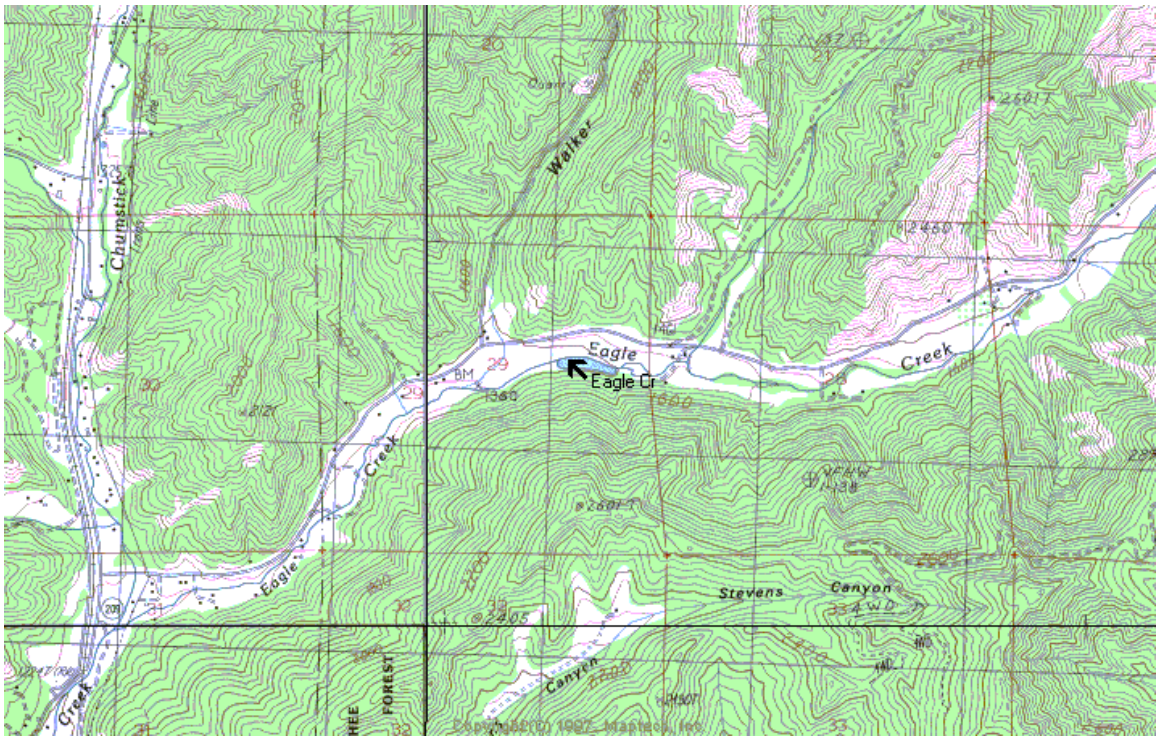
5.2.3 Chumstick subbasin

Acclimation sites in the Chumstick subbasin were proposed by the Technical Team to avoid potential impacts at some sites proposed in the EA. Figures 7 and 8 show locations of two alternative sites in the Chumstick subbasin, one on Eagle Creek (a tributary to Chumstick Creek) and one on Chumstick Creek itself. At both places, it is likely existing ponds could be used as is and that no ground disturbing activities would be required. Only inlet and outlet screens would be needed to control smolt releases. However, capacity and habitat quality at these sites appears to be limited. If proposed releases in the Chumstick are reduced or eliminated, more coho (up to 180,000) could be released from another site, such as Beaver Creek or Butcher Creek. If used, a site in the Chumstick subbasin would be needed in spring of 2002.

Although there are no known observations of listed plants near these sites, the habitat might be appropriate for them. Surveys for listed plants would be undertaken in summer of 2001. If such plants are found, activities at the site will avoid them or the site will not be used.

The limited activities at either site and their distance from known locations of spotted owl nests and lynx dens make it highly unlikely that those listed species would be disturbed. Spawning and rearing steelhead are not expected to be adversely affected because steelhead emerge from gravel after coho have migrated downstream. If natural production of coho increases, there is potential for competition effects on steelhead, although the evidence is inconclusive (see section 5.2.1).

Figure 7. Acclimation site on Eagle Creek.



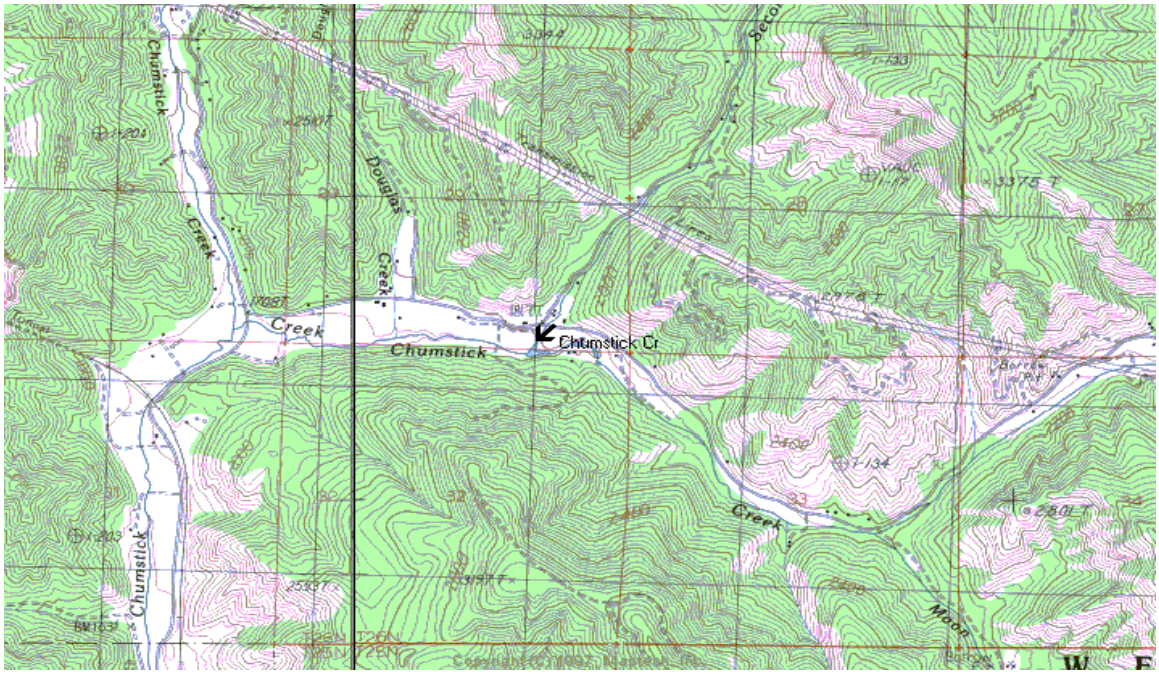


Figure 8. Acclimation site on Chumstick Creek.

5.2.4 Brender Creek

Figure 9 shows a proposed location for a new privately owned acclimation site at Brender Creek, tributary to Mission Creek, which enters the Wenatchee River between the town of Cashmere and Peshastin Creek. The site would be needed in spring of 2003.

The amount of development and types of surveys required would be similar to the Chumstick Creek site. Again, like the Chumstick system, habitat quantity and quality are limited. If used, the site is too far from bald eagles or spotted owls, and the level of proposed development and operational activity too limited, to disturb these species.

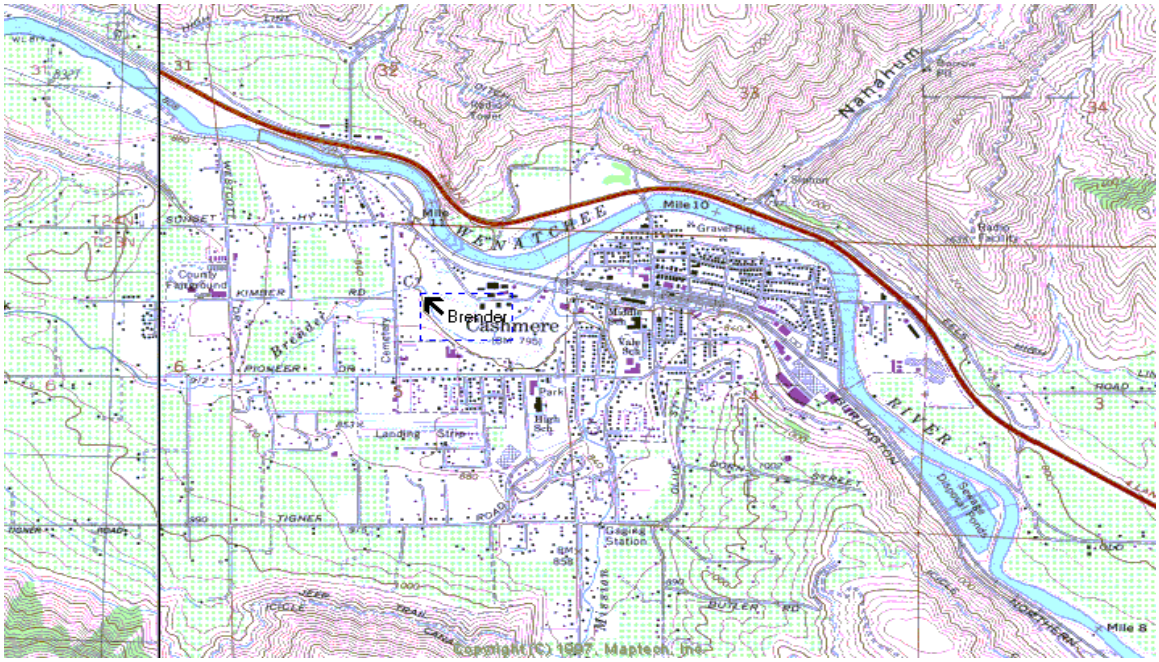


Figure 9. Acclimation site at Brender Creek.

5.3 Effects of Monitoring Activities

As shown in Table 1, new monitoring activities in connection with coho research proposed since publication of the EA include coded wire tagging, weir trapping, tow netting or mid-water trawls, and redd capping or use of an existing artificial spawning channel at Cle Elum (in the Yakima River basin). Increased levels of activities that were evaluated in the EA include additional PIT-tagging and radio-tagging/tracking, rotary trapping at more sites, and year-round electro-fishing or beach seining at additional sites. Some proposed activities are alternatives to others.

The following discusses the effects of the additional activities in the context of the studies they are meant to implement.

5.3.1 Monitor survival and straying

PIT-tagging coho smolts to assess their survival by monitoring the numbers that pass downstream dams was evaluated in the EA. Increasing the numbers tagged will have no adverse effect as coho for this project are considered research fish. Consequences are similar for coded-wire tagging coho smolts to assess survival and straying.

5.3.2 Monitor natural reproductive success (egg-to-fry survival)

The YN will begin to investigate the reproductive success of naturally spawning coho as early as the fall of 2001. Two potential techniques might be employed to accomplish this task. The preferred alternative would be to place coho in an artificial spawning channel to estimate egg-fry survival. An existing artificial spawning channel at the Cle Elum Fish

Hatchery could be used. The alternate method is redd capping conducted near the Butcher, Beaver, Brender, or Chumstick creek acclimation sites. The ultimate decision as to which technique is used will depend on the availability of the artificial spawning channel located at the Cle Elum Supplementation and Research Facility operated by the Yakama Nation in the Yakima basin.

There would be little environmental risk of coho using the existing artificial spawning channel. To protect the water supply, any fish using the spawning channel will be subjected to screening for various pathogens under the fish health guidelines developed by the Pacific Northwest Fish Health Protection Committee. If redd capping techniques are used, a fine mesh net will be buried in the substrate around a maximum of 20 redds approximately one month before the estimated date of fry emergence (February-April). No other species would be affected, except in the highly unlikely event that another species' redd was identified as a coho redd.

5.3.3 Monitor distribution and growth of naturally produced juveniles

In order to better understand the ecology and life history of naturally produced coho in the Wenatchee sub-basin, the YN will conduct field sampling (likely snorkel surveys and/or beach seining) during the early summer through fall to estimate the spatial distribution and growth profiles of naturally produced coho juveniles. Field sampling techniques might also include backpack electrofishing, and could be done in winter also, to determine habitat use by coho. This work could begin as early as the summer of 2001 and is expected to continue through 2005, depending on the distribution and abundance of naturally spawning coho in the Wenatchee basin. The location of this work will ultimately depend upon the spawning location of returning adult coho and the efficiency of broodstock collection. If, as evidenced by radio telemetry and other surveys, natural escapement is high enough to warrant such field work, the project expects it to occur primarily in the vicinity of the Chumstick/Eagle and Brender Creek acclimation sites and in the mainstem Wenatchee River downstream of these locations, because these areas are downstream of adult trapping locations at Tumwater and Dryden dams. However, because the NMFS draft Biological Opinion limits adult trap operation at Tumwater in order to allow passage by other listed species, there is the potential for some coho natural spawning near the other acclimation sites. If that were to occur, field sampling could be done in those areas as well.

As stated in the EA (DOE/BPA 1999, p. 60-61), snorkel surveys would be only a temporary, minor disturbance to fish in the area. Fish would not be handled or harassed. Researchers beach seining or electro-fishing near the acclimation sites have the potential to encounter listed fish as well as other resident and anadromous species important in the basin. Any non-target species would be handled as little as possible and returned immediately to the stream. To reduce the potential for fish mortality, only personnel trained in electro-fishing techniques would use this technique. They would follow guidelines for such procedures established by NMFS (NMFS 1998). With these precautions, increased levels of beach seining or electro-fishing would not adversely affect other fish in the area.

5.3.4 Trap smolts to compare natural and hatchery production and survival

The YN will estimate natural coho smolt production and productivity (egg-to-smolt survival) beginning as early as the spring of 2002 and continuing through 2005. The purpose is to track wild production and to estimate naturally produced smolt-to-adult survival in comparison to hatchery fish performance. To accomplish this task, the YN will operate several fish traps in the Wenatchee basin. Electrofishing and/or beach seining might be used at these same sites if rotary trapping is not successful (see section 5.3.3). The proposed trapping locations and dates of operation are listed below.

Rotary trap sites

- Nason Creek – at RM 0.8 (Nason Creek Campground), downstream of the acclimation sites on Nason Creek. At this site, as mentioned in the EA, a rotary trap would be anchored primarily for studying direct predation on spring chinook (see section 5.3.5), but also potentially to estimate the production of naturally produced coho juveniles, if that were to occur (see section 5.3.3). The trap would be run from March 15 through June 30 if used to estimate natural production. (For predation studies, the trap would be operated late April through May [see section 5.3.5]).
- Wenatchee River – downstream of the outlet of Lake Wenatchee. This existing rotary trap run by WDFW would be used primarily to study direct predation on sockeye (see section 5.3.5). The trap may also be operated to estimate natural coho smolt production above Lake Wenatchee, if that were to occur. YN would collect coho trapped in the WDFW trap between about April 1 and July 31.
- Lower Wenatchee River – at RM (7.1). This existing rotary trap run by WDFW would be used primarily to estimate juvenile coho survival (natural and hatchery origin) for the entire Wenatchee basin.

New trap sites on the White or Little Wenatchee rivers listed in Table 1 would be used only for purposes of the sockeye interactions study. Their effects and operational protocols are described in section 5.3.5.

Weir trap sites

Several juvenile weir traps are proposed in the Wenatchee basin, in tributaries too small for the use of a rotary trap. These traps will be used to estimate the survival, productivity, and the migration timing of naturally produced coho, should other surveys provide evidence of such natural production. Likely weir trap locations are in the lower three miles of Beaver, Brender, and Chumstick or Eagle creeks.

Effects of rotary and weir traps

Effects of rotary trapping were evaluated in the EA (see DOE/BPA 1999, p. 59), but effects of weir trapping were not.

Rotary traps could trap any fish moving downstream and weir traps capture all fish moving either up- or downstream. As stated in the EA, fish can be injured or killed by other fish in the trap or by debris that collects in it. There would be no new impacts from the use of the existing WDFW rotary traps on the Wenatchee River; YN would merely collect coho and enumerate them. The dates and manner of use of the traps, which operate under protocols defined in existing permits, would not change.

The trap used to capture migrating fish on Nason Creek is a floating rotary-type trap manufactured by E.G. Solutions, Inc., Corvallis, Oregon. A five-foot diameter trapping cone supported by an A-frame on two pontoons is used to entrain downstream migrating fish into a live box. The trap will be anchored in place in the river at river mile 0.8 by cables running from the trap to the banks. The cables are attached to fixed structures on the banks (e.g. large trees) and are attached to the trap support posts. The cables will run at an angle from the trap to the banks and will be well above the surface of the river. The trap will be hand-winched from the right bank to approximately mid- channel or in the thalweg[2], depending on velocity conditions, where it will be stationed while fishing. When the trap is not in operation, the rotary-cone will be locked in the up-position to insure that no one becomes entangled in it.

Traps are operated differently depending on the type of study being done. If the Nason Creek trap were operated to estimate migration timing, survival of coho, or natural production, it would be operated from March 15 through June 30. During this period, juvenile steelhead and spring chinook could be trapped as well. However, the rotary trap does not capture all fish in the stream. It would be checked no less than twice a day—more often if the debris load in the stream warrants it—and fish other than coho would be released immediately with minimal handling. These operational protocols are consistent with those observed by other operators in the region, so adverse effects are expected to be minimal.

The weir traps would be operated similarly to the rotary traps. Because weir traps span the width of the stream, they would capture all fish moving both upstream and downstream during the period of operation (March 15 – June 30), but they do not have moving parts that could injure fish. In the tributaries in which weir traps most likely would be used, both adult and juvenile steelhead could be captured, but spring chinook are unlikely to be present. The streams are too small, however, to support large numbers of fish, so few fish are expected to be captured. Non-target fish would be released immediately, with minimal handling, either up- or downstream of the trap (depending on whether the fish is juvenile or adult), so effects are expected to be minimal.

The streams in which weir traps would be operated are small and not normally used by recreational watercraft, so public safety is unlikely to be jeopardized by the traps.

5.3.5 Monitor coho predation on and interaction with spring chinook and sockeye

Coho predation on spring chinook

Effects of this study to assess the amount of coho predation on spring chinook were evaluated in the EA. The only difference is the proposed operational protocols of the rotary trap on Nason Creek (which might also be used to monitor natural production—see section 5.3.4), and the lower number of coho sampled for their stomach contents (1,000 vs. 6,000). The following description of the trap and its effects comes primarily from the research plan for this study (Murdoch 2001(a)).

The trap will be operated from late April, after the release of coho salmon smolts from the Butcher Creek acclimation pond (rm 8.2; HGMP 1999), through May or until coho are no longer captured. YN expects to actively operate the trap daily, principally at night,

[2] The deepest part of the stream.

for 8-hour periods. Personnel will be present at the trapping site at all times when the trap is operating to ensure public safety. When the trap is not in operation, the rotary-cone will be locked in the up-position to insure that no one becomes entangled in it.

The type of trap proposed for this study is designed to capture juvenile fish that are normally found in the water column. The project will be targeting juvenile coho salmon, but traps of this kind will also capture juveniles of other salmonid species and an occasional adult. However, the capture of adult chinook salmon is not anticipated, because the proposed April and May operational period for the Nason Creek trap will not overlap with the June through July migration period or the August through September spawning period of spring chinook in the Wenatchee River basin.

The live box will be emptied and juvenile fish enumerated at intervals no greater than 30 minutes. All fish except coho and spring chinook fry would be released immediately. A sample of the spring chinook fry would be anesthetized with MS-222, measured, and then released. A random sample of the catch each day will be sampled to collect morphometric data. Experience shows that these procedures, when done by experienced personnel, result in little or no injury or mortality. Up to 1,000 of the research coho would be sacrificed and their stomach contents examined for the presence of spring chinook and other species.

Coho interactions with sockeye salmon in Lake Wenatchee

The YN plans to conduct a study to estimate the level of hatchery coho smolt predation on juvenile sockeye salmon fry in Lake Wenatchee in the spring of 2003 (the first year that significant numbers of coho smolts other than experimental fish will be released from the Two Rivers acclimation site). However, before this study can be conducted, substantial field work must be performed to investigate the life history, distribution, and movement patterns of juvenile sockeye and hatchery coho salmon in Lake Wenatchee. These preparatory studies will be conducted in the spring of 2001 and 2002.

This study was anticipated in the EA, but methods had not been identified. Details of study methods and locations of sampling sites are provided in "Sockeye/Coho Interaction Study: Lake Wenatchee" (Murdoch 2001(b)). In brief, to estimate the spatial distribution of juvenile sockeye salmon in Lake Wenatchee, samples of sockeye fry will be taken from various depths and habitats in the lake using a tow net with a cod-end basket mounted at the side of a boat and towed at speeds no faster than 3 miles per hour. The lake will be sampled weekly between April 16 and May 25. To provide replicate samples, bongo tow nets will be towed behind two boats running parallel, 100 feet apart. If tow nets do not provide a sufficient sample, a biological sampling mid-water trawl will be used. In 2002, two rotary traps might also be operated in the White and Little Wenatchee rivers near the head of Lake Wenatchee to estimate when sockeye fry enter the lake and their potential temporal overlap with hatchery coho smolts. These traps would be operated from March 1 through June 30, 2002.

The YN will estimate hatchery coho smolt travel time through Lake Wenatchee and spatial distribution within the lake via radio or sonic telemetry in 2001 and 2002. Up to 150 radio-tagged hatchery coho smolts will be released near the Two Rivers acclimation site in early May. The radio-tagged smolts will be monitored using a combination of fixed and mobile gear. Mobile monitoring will be conducted from a motor boat or land-

based vehicle. Up to six fixed-site monitoring locations will be established around the perimeter of Lake Wenatchee to monitor the travel time and distribution of tagged smolts. Additionally, between 5,000 and 15,000 untagged coho might also be released from this site in 2002 to corroborate the timing data collected from the radio-tagged fish (i.e., is the tag interfering with their behavior). Passage timing would be estimated from coho captured in the existing rotary trap operated by WDFW near the outlet of Lake Wenatchee (see section 5.3.3).

Statistics are unavailable for the potential injury to fish from tow-net sampling. Impacts to adult fish that might be in the lake, such as bull trout or migrating steelhead, are expected to be low, because the size is designed to capture only fry-size fish and, at 3 mph, the speed of the towing boat will be slow enough for larger fish to avoid the net. Due to the study's timing, it is unlikely that adult steelhead would be present at the time of the study (they will likely have spawned, or be spawning), but the nets could capture juvenile steelhead. Juvenile steelhead would be handled in the same manner as spring chinook in the predation study, so little to no mortality or injury is expected.

If the larger mid-water biological sampling trawl must be used, the potential to trap larger fish could be greater, but still relatively low. However, as the nets will be emptied every 10 minutes (or more frequently), and listed species, including bull trout and any juveniles or adults of other species that might be present, will be released immediately, the risk of adverse effects on any species is low. Risks to the target sockeye also would be low because the cod-end basket creates a safe sanctuary at the end of the net.

Two new rotary traps might be established in the Little Wenatchee and White rivers, near the head of Lake Wenatchee, to estimate sockeye entry timing into the lake. Specific locations have not been identified. For this study, they would be needed only March 1 – June 30, 2002. The traps would be monitored as often as necessary, but no less than twice a day, to minimize overcrowding in the livebox and consequent predation, and to remove debris. Some ESA-listed fish species as well as sockeye could be trapped. There is the potential for injury to juvenile sockeye, which would be smaller and more vulnerable to injury than other species during the proposed period of operation. The condition of the sockeye would be carefully monitored and trap operations changed if necessary to avoid adverse effects.

As stated in section 5.3.3, use of the existing WDFW rotary trap near the outlet of Lake Wenatchee for this study would not change operational periods or impacts of the trap.

The establishment and use of fixed radio telemetry monitoring sites along Lake Wenatchee, as well as ground tracking, would not create more disturbance to nesting eagles than already occurs from residents along the lake. The U.S. Forest Service has established a no-wake zone at the upper end of Lake Wenatchee during the boating season, to protect bald eagle nesting, loon nesting, and salmon spawning, while continuing to allow recreational boating in this portion of Lake Wenatchee. The USFS, Chelan County, WDFW, State Parks, and local volunteers maintain "No-Wake" buoys along the lake. The buoys are 1/4 mile from the original nest tree on Squaw Lake and 1,000 feet from the secondary nest tree on Lake Wenatchee. Project staff will observe the no-wake zone when accessing the radio tracking sites or when sampling in the lake. YN

will coordinate its efforts with Forest Service monitoring being done in the same area. Specific mitigation actions to avoid disturbance to these nest sites are:

- Restrict long-term activities within 1/4 mile of bald eagle nest, or 1/2 mile of line-of-sight of nest, between March 1st and July 15th;
- Begin nest site monitoring to determine nesting two weeks prior to motorized activities in the area (USFS);
- No activities will occur in the backwater area of the lake (Glacier View slough area);
- Use "no-wake" speeds within 1/2 mile of nest sites (YN);
- At the nest site, record decibel levels from motorized activities (USFS);
- Limit motorized activities to one day per week (YN);
- Should additional monitoring be needed, use canoes/kayaks outside the line-of-sight of nests (YN);
- Coordinate activities with USFS to work on the same day of the week (YN);
- Select fish monitoring stations that are not within the line-of-sight (screened from the nest) (YN);
- Monitor mitigation effectiveness, determining nesting/reproductive success of this site (USFS).

5.3.6 Monitoring of returning adults using radio telemetry

Effects of this activity were evaluated in the EA. However additional fixed sites are proposed upstream of tributary mouths near acclimation sites in the Methow basin (see Figure 3 for acclimation site locations). Establishment and use of these sites is expected to have little or no adverse environmental effect. As a precaution, however, once proposed sites are identified, the project will request a database search to determine the presence or absence of listed species or sensitive habitat, such as bald eagle or spotted owl nests, to ensure that project activities will not disturb those species.

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