Yakima Basin Fish Passage Project - Phase II

Environmental Assessment

OCT 17 1991

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ENVIRONMENTAL ASSESSMENT

YAKIMA BASIN FISH PASSAGE

PROJECT - PHASE II

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PORTLAND, OREGON**

AUGUST 1991

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EXECUTIVE SUMMARY

YAKIMA BASIN FISH PASSAGE PROJECT - PHASE II

ENVIRONMENTAL ASSESSMENT

Purpose. The purpose of the Yakima Basin Fish Passage Project - Phase II is to increase anadromous fish runs in the Yakima River system. The Bonneville Power Administration (BPA) proposes to fund the construction, upgrade, or retrofit of juvenile fish protection facilities at up to 66 irrigation diversions. The diversions are along the mainstem and several tributaries of the Yakima River in south-central Washington. The purpose of this and other anadromous fishery enhancement projects in the Yakima River Basin is to compensate for fishery losses attributable to mainstem Columbia River hydropower facilities. The Yakima Basin Fish Passage Project is a part of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program (1982), as amended in 1989.

Before the Yakima Valley was settled and before overfishing of Columbia River anadromous fish stocks, the Yakima River Basin supported large runs of spring, summer, and fall chinook; coho and sockeye salmon; and summer steelhead. Today, runs of summer chinook and sockeye are gone. Average run size of returning adult anadromous fish represents only slightly over 1 percent of historical run levels. The Northwest Power Planning Council (Council) and regional fishery experts consider the Yakima drainage to have some of the highest potential for anadromous fish restoration in the Columbia River Basin. The Yakima River and tributary's habitat can support larger populations of salmon and steelhead than currently exist.

Under Phase I of the Yakima River Basin Fish Passage and Protective Facilities Program, BPA and others funded projects to correct fish screening and fish passage deficiencies on the mainstem Yakima River's largest irrigation diversions. Recent research of completed Phase I fish screen facilities shows that 98 percent of young salmon and steelhead can be passed safely back to the river by employing state-of-the-art fish passage designs.

Proposal. In 1988, the Yakima Indian Nation submitted an application to amend the Council's Fish and Wildlife Program to secure Council approval and funding to start advanced engineering designs on the Phase II fish screen program. Based on citizen and agency endorsement, the Council approved the amendment March 9, 1989. The Bureau of Reclamation (Reclamation) was requested to provide engineering and design expertise to the Phase II projects. The Council recommended that BPA provide funding for Phase II screens through its Fish and Wildlife Program.

The proposed action is called the Yakima Basin Fish Passage Project - Phase II Program. The plan is to construct, upgrade, or retrofit juvenile fish protection facilities at up to 66 irrigation diversions, most operated by

private irrigation districts. All but three of the 66 diversions under consideration have existing screens and juvenile fish bypass facilities. But in many cases the screens, fish bypass systems, and water control structures are outdated, run down, or not operating correctly and do not meet today's biological criteria for fish passage protection. Each of the existing and unscreened Phase II locations will be evaluated and equipped with the latest state of the art technology.

Design and construction work under the Phase II program would begin in 1991, and is expected to take 5 years to complete. Projects would be grouped; the current schedule assumes five screen project groupings. For example, eight screens have been designated as the highest priority and termed "Group 1" sites. Work on these eight screens in Group 1 would be done in 1991. These eight screens are designated as Group 1 sites because of their proximity to important spawning and rearing areas and poorly operating or nonexistent screen facilities which cause high juvenile fish losses.

Reclamation and the Washington Department of Fisheries would be responsible for all design work and specifications, contract award and construction oversight. Funding for the Phase II program would be a joint venture between BPA and Reclamation, with Reclamation funding the Tieton Diversion facilities. BPA expenditures for the program are estimated at \$10 million. Reclamation and the Washington Department of Fisheries would be responsible for operation and maintenance of all Phase II facilities. Operation and maintenance costs in excess of those presently funded by water users would be assumed by the United States through BPA.

Environmental Issues. The following major concerns are evaluated in the Environmental Assessment (EA):

- Air Quality. Air quality in the Yakima River Basin ranges from good to excellent. All Phase II sites are in areas with air quality that complies with the National Ambient Air Quality Standards and Washington State standards. Construction activities to implement the proposed action could result in slight, localized, and short-term air quality impacts. Construction specifications would require contractors to comply with all applicable Federal, State, and local air quality standards and emissions limitations. During construction, contractors would be required to use reasonable means to control and minimize atmospheric emissions of air contaminants.
- Water Quality. Water quality in the Yakima River Basin is good to excellent in the upper tributary reaches, but is only fair to poor in the lower Yakima Valley due to irrigation diversions and turbid return flows. In most cases, Phase II fish screen structures and juvenile fish bypass facilities would be constructed during the nonirrigation season, when canals and ditches are dry, so water quality would generally be unaffected by fish screen construction. In situations where construction must occur when canals are running water, a ditch would be excavated around work sites, with an earthfill or sandbag cofferdam constructed upstream and downstream of new screen sites. Digging, construction, and dismantling

the cofferdams could cause temporary and short-term increases in canal water turbidity. It is likely that any turbid water would remain in the irrigation network, however, and the river would be unaffected. Similarly, construction of juvenile fish bypass systems at some of the 66 screen sites would require earthfill or sandbag cofferdams along the streambank to dewater the work area. Installing and removing the cofferdam at each site could cause minor and short-term instream turbidity increases. Construction of the outfall structure for any fish bypass system constructed or retrofitted would require authorization permits from the U.S. Army Corps of Engineers (Section 404 of the Clean Water Act); the Washington Department of Ecology (Water Quality Certification or Modification, Section 401 of the Clean Water Act); and the Washington Departments of Fisheries or Wildlife (Hydraulic Permit Approval). Construction specifications would require the contractor to comply with all Federal, State, and local regulations designed to minimize water pollution.

- Vegetation/Wetlands. Most of the Yakima River Basin has been surveyed and wetlands identified by the U.S. Fish and Wildlife Service under the National Wetlands Inventory Program. Since fish screen facilities function in canals and ditches, some of the Phase II fish screens or portions of the screens could be situated in wetlands. If this is the case, these existing screens will be removed by crane and the concrete foundation will be left in place so that no disturbance to wetlands will occur through removal of existing screens. Wetlands will be identified while designing and locating the new screens. If location of the bypass pipes cannot avoid wetlands, the pipes will be buried and revegetation of the area will occur. Disturbance to wetlands will be avoided whenever possible. If disturbance cannot be avoided, it will be temporary and will not constitute any net loss to wetlands. Construction activities will disturb vegetation by excavation, ground clearing, and trimming or removing trees. Upon completion of construction, excavated areas will be backfilled, and disturbed land will be graded to previous contour. Natural plant succession and reseeding will restore disturbed vegetative cover.
- Fish. Anadromous fish stocks currently using the Yakima River Basin include spring and fall chinook salmon, coho salmon, and steelhead trout. As simulated and predicted by two computer models that predict incremental net fish returns, labeled the Tributary Parameter Model and the System Planning Model, the Phase II screening program would improve salmon and steelhead presmolt and smolt survival. It also would increase the numbers of young fish that reach the ocean, and more adult fish returning to the Yakima River to spawn. Although resident fish species are numerous, Phase II screening program would also benefit them by reducing juvenile fish losses at irrigation diversions. Benefits to resident fish have not been quantified, but the proposed action should result in improved survival of resident game fish.
- Wildlife. Wildlife species found at Phase II project locations depend on habitat provided by rivers, streams, and irrigation canals and drain ditches. Workers and noise from Phase II construction activities would

likely disturb wildlife and disperse animals to other areas. Vegetation could also be temporarily disturbed or eliminated at some sites, reducing wildlife habitat. However, construction work would be temporary, and only small amounts of habitat around the immediate location of the fish screens and along juvenile fish bypass pipe alignments would be disturbed. In addition, the work sites will be dispersed over a large area of the Yakima Basin. Impacts of the Phase II program on wildlife are not expected to be significant or cumulative; it is expected that wildlife would return once construction is completed. State, Federal, and Tribal fish and wildlife authorities will be consulted to develop the most desirable vegetation restoration measures.

- Threatened and Endangered Species and Species of Concern. Listed threatened and endangered plant species occur in the Phase II project areas. There are no federally listed threatened and endangered fish species in the Yakima River Basin. The bald eagle and northern spotted owl are threatened in Washington and are the only federally listed species identified through coordination with the U.S. Fish and Wildlife Service (USFWS). In December 1989, Reclamation initiated informal consultation with the USFWS, by requesting a list of threatened and endangered species. On January 12, 1990, USFWS sent a list to Reclamation which included the bald eagle (Haliaeetus leucocephalus), and three candidate plant species. Since receiving the list from USFWS, the northern spotted owl (Strix occidentalis) has also been listed as threatened in Washington. Reclamation prepared a Biological Assessment on both the bald eagle and the northern spotted owl and sent it to USFWS on January 16, 1991, with the determination that neither species would be affected by the proposed action. The USFWS concurred with the no affect determination on February 11, 1991. USFWS also concurred with the conservation measures identified in the Biological Assessment. Reclamation will perform wintering bald eagle surveys, as described in the Biological Assessment. Reclamation will consult with the USFWS on these continuous surveys of the project areas as construction activities are scheduled. If wintering bald eagles happen into the project area, construction activities may be delayed or mitigation actions taken to ensure no impacts occur. There are currently no spotted owls that utilize the project area. Therefore, this project will not affect the spotted owl. Reclamation will contact USFWS for new information on spotted owl locations a year before beginning construction of each group of projects. If this new information indicates that spotted owls may occur in the vicinity of the proposed project, Reclamation will consult with the USFWS on mitigation actions.
- Cultural Resources. Once the preliminary designs are completed and prior to construction, all project construction sites will be surveyed for cultural resources. Screens and the irrigation facilities in which they are located will be assessed for their historical significance. If any areas of significant cultural or historic resources are identified during the initial surveys, a determination will be made to either avoid the area, remove the information, or relocate the proposed activities. Representatives of the Yakima Indian Nation will continue to be involved and will be consulted regarding traditional use and religious significance of each of the 66 fish screen locations. All activities are being coordinated with the Washington State Historic Preservation office.

- Solid Waste and Hazardous Materials Management. Solid waste products are not generated during operation or maintenance of existing fish screen facilities. During Phase II construction, there would be no use of hazardous materials. Hazardous waste inventories will be conducted by BPA and Reclamation personnel at each Phase II site prior to fish screen construction. Provisions in construction contract specifications will require maintenance of an orderly work area, and the contractor will be allowed to dispose of solid waste materials only at approved dump locations.
- Noise. Most project locations are rural. Construction noise may disturb wildlife, but project locations will be widely dispersed, and noise will be localized and muffled by vegetation and topography. The construction contractor will be required to comply with applicable Federal, State, and local laws and regulations concerning the prevention, control, and abatement of noise.
- Land Use. All project sites are on existing irrigation diversion canals or ditches. Typically the sites are found in or near undeveloped natural river bottom areas or on rural farmlands. Implementation of the Phase II fish screen program would not significantly affect existing land uses. No cropland areas are planned to be converted or lost as a result of the project. County or Yakima Indian Reservation authorities will be contacted prior to construction at each of the 66 sites, and necessary zoning permit or special land use applications will be made to the relevant jurisdictions.
- Floodplains. All facilities would be located within the floodplain and would be designed to withstand flooding. None of the projects is expected to have adverse flooding impacts on humans, although county authorities and the Federal Emergency Management Agency will be contacted to assure that any fish screen modifications or new construction would not increase the likelihood of downstream damage by flooding.

Conclusions. Any negative effects of the Yakima Basin Phase II fish passage project, as summarized above, would be temporary and minor. No significant adverse environmental effects from construction and operation of the Phase II project have been identified. Implementation of the Yakima Basin Phase II project would improve the production of anadromous fish in the Yakima River system. The Phase II screens would allow greater numbers of juvenile anadromous fish to survive; as a consequence, there would be higher returns of adult salmon and steelhead to the Yakima River. Based on the evaluation presented in the EA, there would be no significant adverse environmental impacts if the proposed action is implemented.

(VS6-PGB-9563K)

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CHAPTER 1

PROPOSAL AND BACKGROUND

1.1 INTRODUCTION

Because the Yakima River Basin has excellent potential for anadromous fishery enhancement, considerable attention has been paid in recent years to plan for and implement projects that are intended to improve salmon and steelhead runs within the Basin's 6,155-square-mile watershed. The Northwest Power Planning Council's (Council) adoption of the Columbia River Basin Fish and Wildlife Program on November 15, 1982, was a major boost to those efforts. The Fish and Wildlife Program specifies measures to protect, mitigate, and enhance fish and wildlife populations that were adversely affected by Columbia River hydroelectric developments. To a large extent, the Council's fish and wildlife enhancement efforts are implemented and funded by Bonneville Power Administration (BPA). BPA uses revenues from the Columbia River Federal Power System to fund the Fish and Wildlife Program. To date, the Council's Fish and Wildlife Program has directed about \$70 million to be spent on designing, constructing, and operating and maintaining anadromous fishery enhancement projects in the Yakima River Basin. These "offsite" enhancement projects are a means to compensate for fishery losses attributable to mainstem Columbia River hydropower facilities.

The Yakima River Basin is located in south-central Washington (see project location map). The Basin is centered around the City of Yakima and includes most of Yakima and Kittitas Counties, as well as small portions of Benton and Klickitat Counties. The 1.3-million-acre Yakima Indian Reservation is located in the southwest corner of the Basin just south of the City of Yakima. The Yakima River originates near the crest of the Cascade Range and flows 214 miles southeasterly to its confluence with the Columbia River at Richland, Washington (river mile (R.M.) 335.2). Major tributaries include the Kachess, Cle Elum, and Teanaway Rivers in the northern sector of the Basin and the Naches River in the west. The Naches has four tributaries--the Bumping, American, Tieton, and Little Naches Rivers. Ahtanum, Toppenish, and Satus Creeks join the Yakima in the lower Basin. There are six major Bureau of Reclamation (Reclamation) reservoirs located in the Basin that provide about 1,071,000 acre-feet of active storage for irrigation purposes. These reservoirs include Keechelus, Kachess, Cle Elum, Rimrock, and Bumping Lakes, which originally were natural lakes prior to damming, and Clear Lake.

1.2 PURPOSE AND NEED

The Yakima River Basin historically supported large runs of anadromous fish ^{1/} stocks of spring, summer, and fall chinook, coho and sockeye salmon, and summer steelhead. The annual historic run size for these fish has been estimated as shown in Table 1.

^{1/} Fish species which spend their adult lives in the ocean environment and migrate to fresh water to spawn.

**Table 1--Estimated Historic (Prior to About 1870) Run Sizes
of Anadromous Fish in the Yakima River Basin**

Species/Race	Historic Run Size
Spring chinook	~200,000
Summer/fall chinook	~200,000
Early coho	~110,000
Sockeye	~200,000
Summer steelhead	~80,000
TOTAL	~790,000

Source: From Columbia Basin System Planning, Public Review Draft -
Yakima River Subbasin Salmon and Steelhead Plan [1] ^{2/}

^{2/} A number in brackets refers to the number of the reference in the literature cited.

Today, summer chinook and sockeye runs in the Yakima system are extinct, and returns of the other anadromous fish stocks are greatly reduced from historic levels. Mean run size to the Yakima Basin for all adult anadromous fish in the years 1983 through 1987, has been estimated at only 8,835 fish [1]. This represents little more than 1 percent of historic run levels.

The storage and diversion of natural runoff for Yakima Basin irrigation purposes has competed with the need to provide instream fishery flows. Reservoirs and dams have inundated and blocked historic spawning and rearing reaches. At times, these same reservoirs can improve fishery conditions by augmenting flows when summer flows are low. Numerous irrigation diversion dams and canals historically inhibited fish passage for both adult and young downstream migrant fish. Water quality and fish habitat has been adversely impacted by agriculture, forestry, urban, and rangeland use practices. Channelization and diking projects have reduced instream fish habitat. Outside the Yakima Basin, turbine mortality and migration delays at four mainstem Columbia River hydroelectric dams result in heavy losses on smolt and adult migrants. Near the end of their life cycle, adult salmon and steelhead are subjected to ocean and inriver commercial, sport, and Tribal fisheries while returning to their ancestral spawning grounds.

Despite the above problems, the Council [2] and regional fishery experts consider the Yakima drainage to have some of the highest potential for anadromous fish enhancement in the Columbia River Basin. BPA has funded projects to correct fish screening and fish passage deficiencies on the mainstem Yakima River's largest irrigation diversions under Phase I of the Fish Passage and Protective Program. The Yakima River and tributaries habitat can support larger populations of salmon and steelhead than currently exist. A comprehensive evaluation of the Basin's fishery resources has recently been

carried out under the Council's subbasin planning process [1]. This investigation revealed many fishery treatment opportunities that could be used to increase runs of fish in the Yakima River system.

In addressing the Yakima Basin's fish habitat problems, the subbasin planning report discussed deficiencies associated with the many small to medium sized irrigation diversion fish screens scattered throughout the drainage. These screens are located on diversion ditches and canals with flows ranging from 1 to 250 cubic feet per second (cfs). Fish screens are intended to prevent young fish from entering irrigation diversion canals (entrapment) by guiding them back to the original river channel. Recent research on completed Phase I fish screen facilities reveals that 98 percent of all young salmon and steelhead can be passed safely back to the river by employing state-of-the-art fish passage designs. Most existing fish screening facilities targeted for the Phase II program have been found to be inadequate in design, obsolete, deteriorating, or in need of modifications or new operating component parts.

The Figure 1 photos show typical drum fish screens that will be upgraded under the Phase II program. A few irrigation diversions remain totally unscreened. The diversions are located in salmon and steelhead production areas and collectively constitute a significant hazard to the fishes' early life stages. Fry ^{3/} and smolts ^{4/} migrate downstream close to riverbanks. They naturally swim into canals and ditches seeking the low-velocity flows typically found there. Once the young fish are in these artificial water courses, they can become trapped. Recent studies [1] concluded that once smolt enter and pass diversion headworks, an estimated 36 percent are lost due to fish screen design and operating deficiencies.

Some of the more common deficiencies associated with existing fish screens include:

- Screens that are located too far downstream from the canal headworks.
- Screen wire mesh openings that are too large.
- Waterflow approach velocity into screen(s) too high.
- Entrance openings to juvenile bypasses too small.
- Juvenile bypass flow velocity too low or insufficient head differential to properly operate bypass system.
- Old concrete structures that are deteriorating at fish screen facilities.

^{3/} Newly hatched and juvenile fish up to about 2.3 inches in length.

^{4/} A juvenile anadromous fish at the stage in which it migrates from fresh to salt water.

THE SELAH-MOXEE (NO. 8) FISH SCREENS SHOWING TRASHRACKS,
DRUM SCREENS, AND PADDLE WHEELS

A SMALL FISH SCREEN FACILITY AT THE 3-5 CFS EMERICK (NO. 43) DIVERSION

Figure 1. Photos of existing fish screens

- Insufficient water level on drumscreens(s) or oversubmergence.
- Screen(s) that are oriented perpendicular (90 degrees) to canal waterflow.
- Poor access to screen locations for maintenance and servicing.
- Screen mechanical equipment such as drive mechanisms, screen seals, gantry crane, fencing, or general hardware in need of replacement.
- Poorly designed and operating water check structures.

1.3 PROPOSED ACTION

The proposed action is called the Yakima Basin Fish Passage Project – Phase II. The plan is to construct, upgrade, or retrofit juvenile fish protective facilities at up to 66 irrigation diversions. The sites under consideration are shown on the project location map (Figure 2). Most of the diversions are operated by private irrigation districts. Additional information on each screen site, including ownership, location, operational deficiencies, recommended modifications, and site maps can be found in Appendix A of this document. The amount of water diverted at the 66 diversions ranges from 1 to 250 cfs. The diversions are located along the mainstem and several tributaries of the Yakima River. All but three of the 66 diversions under consideration have existing screens and juvenile fish bypass facilities. In many instances the screens, fish bypass systems, and water control structures are outdated, rundown, or not operating correctly and do not meet today's biological criteria for fish passage protection.

Fish protection, engineering, and design standards have advanced in recent years to the point where nearly 100 percent of all juvenile fish entering irrigation diversion canals can be safely passed back to the natural river channel. Each of the existing and unscreened Phase II locations will be evaluated and subsequently equipped with the latest state-of-the-art technology.

1.3.1 Construction Schedule and Sequence

As presently envisioned, design and construction work under the Phase II program is expected to span a 5-year period. Projects would be grouped to focus attention on high priority facilities. Of the 66 potential project site locations, eight screens have been designated as the highest priority, Group 1 sites. Group 1 sites are located where juvenile fish losses are high. These sites were chosen for Group 1 because of their: (1) proximity to important spawning and rearing areas, and (2) poorly operating or nonexistent screen facilities. The following locations have been tentatively identified as Group 1 sites:

Figure 2. Project location map

YAKIMA RIVER BASIN

SITE NO. SITE NAME

- 1 - KIONA
- 2 - SNIPES / ALLEN
- 3 - BOISE CASCADE
- 4 - UNION GAP
- 5 - MOXEE
- 6 - HUBBARD
- 7 - TAYLOR
- 8 - SELAH MOXEE
- 9 - MC AUSLAND
- 10 - T-JOSSEM
- 11 - VERTREES NO. 2
- 12 - VERTREES NO. 1
- 13 - FOGARTY
- 14 - BULL
- 15 - ELLENSBURG MILL
- 16 - NEW CASCADE
- 17 - PACKWOOD
- 18 - OLD CASCADE
- 19 - O'CONNOR
- 20 - YOUNGER
- 21 - OLD UNION
- 22 - FRUITVALE
- 23 - WIP (TOPPENISH PUMP)
- 24 - NACHES-COWICHE
- 25 - CHAPMAN-NELSON

SITE NO. SITE NAME

- 26 - CONGDON
- 27 - GLEED
- 28 - POWELL
- 29 - LEWIS (MILL)
- 30 - LA FORTUNE
- 31 - IRELAND
- 32 - SCOTT
- 33 - BREWER
- 34 - KELLY
- 35 - LOWRY
- 36 - CLARK
- 37 - FOSTER-NACHES
- 38 - JOHN COX
- 39 - NACHES-SELAH
- 40 - CARMACK
- 41 - HOLWEGNER
- 42 - LINDSEY
- 43 - EMERICK
- 44 - ANDERSON
- 45 - TENNANT
- 46 - SINCLAIR-COBB
- 47 - GNAVAUGH
- 48 - BECK
- 49 - MC DANIELS

SITE NO. SITE NAME

- 50 - BUGNI
- 51 - SEATON
- 52 - COOPER-MASTERTSON
- 53 - PETERSON
- 54 - MUSETTI
- 55 - BALLARD
- 56 - CONTRATTO
- 57 - GIUSTETTI-CONTRATTO
- 58 - GIUSTETTI-BUSSOLI
- 59 - BUSSOLI
- 60 - BROCKBANK
- 61 - CONTRATTO-BANCHI
- 62 - FAVRO
- 63 - YAKIMA-TIETON
- 64 - SHATTUCK COMPLEX
- 65 - WIP (LOWER SITE)
- 66 - WIP (UPPER SITE)

NOTE:

PSH 22 Primary State Highway

3-9-90 GFG 100	REVISED
1-17-90 GFG 100	REVISED
10-17-89 GFG 100	REVISED AND REDRAWN
ALWAYS THINK SAFETY	
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION YAKIMA PROJECT - WASHINGTON YAKIMA FISH PASSAGE PHASE II SCREEN SITES LOCATION MAP	
DESIGNED	FIELD APPROVAL
DRAWN	TECHNICAL APPROVAL
CHECKED	APPROVED
BOISE IDAHO	OCTOBER 1989 33-100-1347

- No. 1 Kiona** – relocate/replace present screen facilities
- No. 16 New Cascade** – upgrade present screen facilities
- No. 24 Naches/Cowiche** – upgrade, consolidate, or replace present screen facilities
- No. 26 Congdon** – relocate/replace present screen facilities
- No. 27 Gleed** – consolidate or relocate present screen facilities
- No. 34 Kelly and No. 35 Lowry** – consolidate and replace present screen facilities
- No. 64 Shattuck** – construct screen facilities

Figure 3 on the following page shows the proposed schedule and sequence of predesign, final design, and construction during the Phase II screening program. This schedule assumes five separate screen project groupings. As depicted, construction would be finished in 1996. Most construction would be accomplished during the nonirrigation season (approximately November through March). As such, it would not be necessary to curtail irrigation water deliveries, and work done in canal courses would be "in the dry" and will be referenced as civil works construction. Civil works construction includes earth excavation, form structure, and concrete placing for the screen structures and juvenile fish bypass system. In certain cases, it might be necessary to construct during the irrigation season. In such cases, a channel would be excavated and irrigation water would be temporarily passed around the worksite.

Reclamation and the Washington Department of Fisheries (WDF) would be responsible for all design work and specifications, contract award, and construction oversight. BPA expenditures for the program are presently estimated at \$10 million. Funding for the Phase II program would be a joint venture between BPA and Reclamation, with Reclamation funding the Tieton Diversion facilities.

1.3.2 Operation and Maintenance

Reclamation and/or the Washington Department of Fisheries would be responsible for operation and maintenance of all Phase II facilities. Operation and maintenance costs in excess of those presently funded by water users would be assumed by the United States through BPA.

Figure 3. Proposed schedule for Yakima Basin Fish Passage Project - Phase II

A preventative maintenance program would be developed for these facilities using similar procedures developed for the Phase I facilities. Provisions would be made for monitoring during the initial phase of operation, developing an operation and maintenance manual, and adjusting operations to most efficiently and effectively accomplish facility purposes. An important part of the program would be a report and review process. This review process would be done to assure that equipment functions properly, fish are protected from injury, delay, or mortality and delivery of water past the screen to the water users is steady and reliable. WDF presently inspects the existing screens on a weekly or semiweekly basis for proper operation with a thorough post-season inspection "in the dry" to assess the need for repair. The same inspection program is anticipated for the new Phase II facilities.

Costs for annual operation and maintenance of fish screens include funds to provide for periodic replacement of seals, bearings, screen mesh, slide gates, and other structural metalwork. Operational costs include allowances for cleaning trashracks; routine cleaning, lubrication, and maintenance of screens and gates; and adjustment of flow distribution for screen and bypass operation to meet varying flow conditions. Also included during the initial years of operation are costs for measurement, sampling, and other studies to evaluate the effectiveness of the fish screens.

Maintenance costs are primarily associated with periodic cleaning; repair; painting; and replacement of screen mesh, seals, gates, and structural metalwork. Removal of debris and silt accumulation at screens is included. Removal of silt from screen forebay areas each year is expected to be a major maintenance cost for screens at some locations.

1.4 PROGRAM DEVELOPMENT AND AGENCY PARTICIPATION

On October 28, 1988, the Yakima Indian Nation submitted an application to amend Sections 803(b) and 1403(4.5) of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program to secure Council approval and funding to start advanced engineering designs on the Phase II fish screen program. Shortly thereafter, the Council voted to initiate rulemaking [4] on the amendment request, and during January 1989, hearings were held to solicit comment. Based on citizen and agency endorsement, the Council subsequently approved the amendment on March 9, 1989. With the Council's action, Reclamation was requested to provide engineering and design expertise to the Phase II projects. The Council recommended that BPA provide funding for Phase II screens through its Fish and Wildlife Program.

Throughout 1989, a technical work group (TWG) consisting of representatives from Reclamation, BPA, National Marine Fisheries Service, USFWS, Washington Department of Fisheries, Washington Department of Wildlife, Washington Department of Ecology, the Yakima Indian Nation, and Yakima valley irrigation districts met to coordinate the Phase II screening program. The same TWG helped direct design efforts for the Phase I fish passage and protective facilities. The TWG will continue to meet and coordinate activities

throughout the Phase II project. A work plan, schedule, and budget has been developed and all 66 screen sites have been field examined to verify fish protection problems and site-specific remedies.

1.5 RELATED ACTIONS AND OTHER ACTIVITIES

1.5.1 Phase I Fish Passage and Protective Facilities

Following congressional authorization in Public Laws 98-381 and 98-396 in August 1984, a major design and construction effort was initiated under the Council's Fish and Wildlife Program [3] to improve anadromous fish passage at 16 large irrigation and hydroelectric diversions on the mainstem Yakima and Naches Rivers. "Phase I" of the Yakima River Basin Fish Passage and Protective Facilities program primarily involved the installation and renovation of irrigation canal fish screens and diversion dam fish ladder improvements. Total cost for the Phase I program was projected at \$57.6 million. See Table 2 on the following page for Phase I projects. BPA, Reclamation, State of Washington, City of Yakima, and the Bureau of Indian Affairs provided funding. BPA and Reclamation also provided design, engineering, and contract administration. Phase I construction was completed in late 1989, at a cost of \$50 million.

1.5.2 Yakima River Basin Water Enhancement Plan (YRBWEP)

The YRBWEP study is being conducted jointly by Reclamation and Washington Department of Ecology. The primary objectives of the study are to:

- (1) provide supplemental water supplies to presently irrigated lands;
- (2) provide water for new irrigation development on the Yakima Indian Reservation;
- (3) provide water to increase streamflows to protect and enhance anadromous fish; and
- (4) develop a comprehensive plan for efficient management of the Basin's water supplies.

1.5.3 Northwest Power Planning Council's Subbasin Planning

The Council's Fish and Wildlife Program calls for long-term planning to develop strategies for doubling salmon and steelhead production throughout the Columbia River Basin [1]. This effort consists of completing integrated "subbasin plans" for each of the Columbia River Basin's 31 major river drainages, including the Yakima River system. These plans are being developed by agency and Tribal fishery management entities under the auspices of the Columbia Basin Fish and Wildlife Authority. The subbasin plans document current and potential fish production in each of the 31 river drainages, present fishery management objectives, and problems and opportunities associated with increasing anadromous fish runs. A public review draft of the Yakima River Subbasin Plan [1] was released in September 1989. All subbasin plans are to be integrated into a total Columbia River Basin system plan. Once completed, the system plan will guide the Council in adopting salmon and steelhead enhancement projects.

Table 2--Summary of Phase I Completed Facilities
and Construction Costs (in millions)

SITE	CONSTRUCTION		EST. COST	SPENT	FUND FROM
	START	END			
Sunnyside					
Screen	Oct 84	Sep 85	2.9	2.9	BPA
Ladders	Oct 84	Mar 85	2.0	2.0	BPA
Crest Raise	Sep 85	May 86	0.1	0.1	BPA
Naches-Cowiche					
Ladder & Screen	Nov 84	Sep 85	0.5	0.5	Yakima
Horn Rapids					
Richland Canal Screen	Apr 85	Nov 85	0.4	0.4	BPA
Ladders & CID Screen	Sep 85	Jul 86	1.6	1.6	State/ Recl.
Wapato					
West Branch Ladder	Nov 84	Jun 85	1.2	1.2	BIA
Screens	Oct 85	Mar 86	2.8	2.8	BPA
East Branch Ladders	Jul 86	Dec 86	1.8	1.8	BPA
Toppenish Cr/Satus Unit					
Ladder & Screens	Oct 85	Mar 86	1.6	1.6	BPA
Chandler Canal					
Screens & Juvenile Fac.	May 86	Mar 87	7.9	7.6	Recl.
Prosser					
Right Bank Ladder	Oct 85	May 86	1.2	1.2	Recl.
Right Bank Trap	May 88	Nov 88	0.9	0.9	Recl.
Left & Center Ladders	Sep 88	Sep 89	1.9	1.8	Recl.
Roza					
Screens	Dec 85	Feb 88	11.4	11.6	Recl.
Ladders	Oct 87	May 88	2.4	2.2	Recl.
Roza Powerplant					
Wasteway Barrier	Oct 86	Mar 87	0.8	0.8	Recl.
Satus Creek					
Ladder	Aug 86	Sep 86	<0.1	<0.1	BPA
Toppenish Creek					
Screen	Sep 86	Mar 87	0.3	0.3	BPA
Marion Drain					
Ladder	Nov 87	Mar 88	0.2	0.2	BPA
Westside					
Screen	Oct 87	Mar 88	0.6	0.6	BPA
Easton					
Screens	Mar 88	Mar 89	4.2	4.1	Recl.
Ladder	Jun 88	Mar 89	2.9	2.4	Recl.
Town					
Ladder & Screen	Sep 88	Sep 89	1.8	1.3	BPA/ Recl.
Taneum Creek Diversions					
Ladders & Screens	Nov 88	Sep 89	0.8	0.4	Recl.

TOTAL

\$50.4

1.5.4 Yakima-Klickitat Production Project

Plans are underway to construct supplementation facilities for rearing and acclimating fish in the Yakima and Klickitat River Basins. These facilities would increase harvest and enhance natural production of salmon and steelhead while maintaining the genetic integrity of fish stocks. The proposed facilities would be funded by BPA under the Council's Fish and Wildlife Program. A master plan was completed in October 1988, and predesign studies were submitted to the Council in April 1990. The environmental assessment (EA)[5] on the project was also completed by BPA in April 1990, as part of the preliminary design report. As portrayed in the EA, the Yakima Basin facilities would consist of three central fish facilities and several rearing and outplanting sites located throughout the Basin. Spring, summer, and fall chinook, coho, and possibly sockeye salmon would be raised in addition to summer steelhead. Extensive research would be conducted to determine the effects of artificial production on wild stocks of Yakima River salmon, steelhead, and resident trout. Plans call for producing and releasing over 7.5 million salmon and steelhead smolts into the Yakima River from the proposed facilities.

CHAPTER 2

ALTERNATIVES CONSIDERED

2.1 NO ACTION

As required under the National Environmental Policy Act (NEPA), the No-Action Alternative must be identified as a possible alternative. With the No-Action Alternative, there would be no project to improve juvenile fish passage conditions at the 66 sites being considered under the Yakima Basin Fish Passage Project - Phase II. Significant juvenile fish losses at these sites would continue. The Council's efforts to increase anadromous fish production in the Yakima River system would be reduced. Lack of Phase II implementation could reduce the effectiveness of other Yakima Basin fishery enhancement projects, such as the proposed supplementation facilities. Under the No-Action Alternative, the objective of increasing anadromous fish production in the Yakima River system would not be met. The No-Action Alternative would be inconsistent with Measures 803(b) and 1403(4.5) of the 1987 Columbia River Basin Fish and Wildlife Program and the intent of the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act). The deficiencies of the existing fish screens would continue to contribute to fish mortality. Because the No-Action Alternative would not meet the need for the project it is eliminated from further discussion in this document.

2.2 PROPOSED ALTERNATIVE

This section provides a detailed description of the proposed action design criteria and concepts.

2.2.1 Fish Screen and Juvenile Bypass Design Criteria

The purpose of a fish screening facility is to protect juvenile fish from injury and mortality associated with water being diverted for irrigated agriculture. To do this, the screens must physically keep the targeted fish species at certain life stages from going into the canals and out on to the irrigated fields, and then safely and rapidly return them to the river. The primary design criteria related to the Phase II fish screen program are mesh size, approach velocity, screen orientation, sweeping velocity, and bypass features [6]. These various criteria have been researched and adopted by the WDF, the National Marine Fisheries Service, and other regional fishery entities.

WDF defines fry as juvenile fish less than 2.3 inches in total length. Fish screen facilities in the proposed program need to protect salmon fry as small as 1.35 inches and steelhead fry as small as 1.15 inches. The WDF criteria for mesh size are based on studies conducted by the California Department of Fish and Game. These studies found that a mesh of 1/8-inch clear opening was needed to protect the smallest steelhead fry.

The approach velocity is water movement perpendicular to the face of the screen, against which juvenile fish must swim while being passively guided into the bypass system. WDF criteria for approach velocity of chinook and steelhead fry is 0.4 feet per second (ft/s). Uniformity of this flow across screens is a vitally important consideration in design, because nonuniform flow could result in velocities high enough to impinge fry on the screens.

The sweeping velocity is the water movement parallel to the screen face, which is provided by angling the screen relative to the canal flow. The sweeping velocity is necessary because (1) juvenile fish can swim against the approach velocity for only a short amount of time, and (2) juveniles may not find the bypass unless carried passively into the bypass entrance by the sweeping velocity. The WDF standard for sweeping velocity is a ratio of sweeping to approach velocity equal to or exceeding 2 to 1.

Bypass entrances should extend vertically the full depth of the screening structure so that juvenile fish can move directly into the bypass whatever their location in the water column. Water velocities into and through the bypass should be large enough to quickly sweep the small fish through the bypass and back into the stream. WDF standard for water velocities through the bypass pipe is that they exceed 4.0 ft/s.

2.2.2 Fish Screen and Juvenile Bypass Design Concepts and Structural Modification Considerations

Each of the 66 Phase II screen sites would be evaluated in terms of the above-described design criteria. A general description of each screen site is presented in Appendix A.

By today's standards, many of the existing screens are so outdated in design and operation that it would be difficult to adequately retrofit or modify them to bring them up to acceptable fish protection standards. In such cases, the screen facility would be abandoned and totally replaced. At other sites, many features of the screen and juvenile fish bypass meet current design and operation standards, requiring only minimal modifications. Such situations might, for instance, require only installation of finer mesh wire on the drum screens or replacement of rusted or worn out mechanical equipment. Whether building a new fish screen or retrofitting an existing structure, the Phase II fish screening program would attempt to utilize certain proven design and operational features.

The facilities constructed or modified under the Phase II screening program would most often be rotating drum screens with stainless steel wire mesh having 1/8-inch clear openings. When rotating, these screens self-clean accumulated debris. They are powered by electric motors or by water-driven paddle wheels. Where possible, the screens would be angled at about 25 to 30 degrees to the canal flow to provide a sweeping velocity two or more times the approach velocity. The screens would be designed so that the maximum perpendicular approach velocity would not exceed 0.4 ft/s at the design canal flow. Screens would be submerged to a maximum of about 75 percent of their

diameter. Supporting piers between screens would be as flush as possible with the screen face.

The bypasses would be full depth slot bypasses with flow adequate to produce entrance approach velocities of 2 to 3 ft/s and flow velocities through the bypass pipes of 4.0 to 4.5 ft/s. If necessary, intermediate bypasses could be located along the screen bank to limit the maximum travel time for a juvenile fish across a screen set to about 2 to 2-1/2 minutes. The drawing in Figure 4 illustrates a typical fish screen structure incorporating design concepts that would be used in the Phase II program.

Experience from Phase I has shown that there is a need for more uniformity in the screen designs. As many sites as possible should use similar sized drumscreens. Seals and gearboxes should be standardized as well as trashrack angles and bar spacings. The seal contact area should be on stainless steel wear plates and large enough to prevent fish passage but small enough to avoid excessive friction, therefore extending the life of the motors and gear heads.

Other fish screening designs and engineering solutions may be utilized in certain circumstances. For instance, some locations may be more adaptive to the use of a flat plate screen utilizing automatic wiper blades to remove debris. Consideration may also be given to the use of electric solar panels and storage batteries to power small drumscreens in isolated locations. Other new technologies may be evaluated.

2.3 CONSOLIDATION ALTERNATIVES

The number of Phase II fish screen projects and river diversions would be reduced by consolidating irrigation diversion and conveyance systems. For the moment, however, consolidation must be viewed only as conceptual. There could be water rights complications, and combining irrigation facilities would require cooperation among water users in planning, designing, constructing, and operating new jointly used irrigation works. It is also likely that water users would be required to fund any structural components specifically related to irrigation facilities. This could make consolidation economically prohibitive for some irrigation districts. Possible benefits of consolidation include fewer diversions impacting juvenile salmon and steelhead, lower capital costs in fish protective facilities, irrigation water savings, and a reduction in operation and maintenance costs to water users. Inventory of the 66 Phase II sites has revealed that certain locations discussed below could be considered for consolidation.

2.3.1 Yakima River Diversions

The Roza Irrigation District obtains water through its diversion at the Roza Diversion Dam (R.M. 127.9) into the Roza Main Canal. Four districts could be served by new gravity pressure water service from the canal, eliminating the need for four separate fish screens at the No. 8 Selah-Moxee, No. 5 Moxee, No. 6 Hubbard, and No. 4 Union Gap sites.

Figure 4. Typical Fish Screen

Other possibilities include combining the No. 11 Vertrees No. 2, No. 12 Vertrees No. 1, and No. 13 Fogerty sites at one screen facility located on the Fogerty Ditch Diversion (R.M. 153.0) and eliminating the No. 18 Old Cascade screen by providing irrigation delivery from Kittitas Reclamation District Canal.

2.3.2 Naches River Diversions

The potential exists for eliminating the No. 27 Geed screen (diversion at R.M. 9.4) by providing irrigation service from the Wapatox Canal. Screens at No. 34 Kelly and No. 35 Lowry sites (diversion on R.M. 13.7) would be combined into one facility. The high priority No. 39 Naches-Selah screen (diversion at R.M. 18.4) could be moved about 1 mile further upstream and combined with a water supply diversion that would be needed for the proposed Oak Flats fish hatchery.

The potential exists for eliminating several small diversions from the South Naches Channel and combining them into a single diversion point. A combined district is being formed, and funding is being secured for feasibility studies. The sites presently involved are the No. 32 Scott, No. 37 Foster-Naches, No. 29 Lewis, No. 28 Powell, and No. 30 LaFortune. These diversions could also be combined with the Naches-Selah Diversion if it is relocated to Oak Flats on the upper Naches River.

CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter discusses the existing conditions of various key resource components in the project area, followed by the environmental impacts on those resources from implementing the proposed action. Affected resources and environmental impacts from implementing the consolidation alternative would be the same as discussed for the proposed action. Where applicable, recommended mitigation of adverse environmental impacts is also provided.

3.1 CLIMATE/AIR QUALITY

3.1.1 Existing Conditions

The climate of the Yakima River Basin ranges from cool and moist in the Cascade Range to warm and dry in the lower valleys. Annual precipitation near the Cascade crest ranges from 80 to 140 inches, whereas the lower elevations in the eastern part of the Basin receive 10 inches or less. Summer temperatures average 55° Fahrenheit (F) in the mountains and 82°F in the valleys. Average maximum winter temperatures range from 25°F to 40°F, while average minimum winter temperatures range from 15°F to 25°F. Minimum temperatures of -20°F to -25°F have been recorded in most areas.

Air quality in the Yakima River Basin ranges from good to excellent. All Phase II sites are located in areas having air quality that is in compliance with the National Ambient Air Quality Standards and Washington State standards. Higher elevation areas in the upper Basin have excellent air quality. Occasionally, standards are exceeded for short periods for carbon monoxide and suspended particulates in the City of Yakima area. Lower valley areas can have high levels of natural windborne particulates originating from fallow croplands during windy periods. Burning crop and forest residues and vehicle travel on gravel roads are often sources of particulates during the summer and fall. The urban Yakima area, which is surrounded by hills and ridges, can experience poor atmospheric dispersal of pollutants from automobiles and industry during winter inversions.

3.1.2 Environmental Consequences

3.1.2.1 Proposed Action. Construction activities under the proposed action would result in very slight, localized, and short-term air quality impacts. Operation of trucks and other equipment at work sites could minimally increase dust particulate and gaseous emission levels in the immediate area. Most construction would be conducted during the nonirrigation season and in dewatered canals. Soil conditions would be relatively moist, reducing the opportunity for dusty work conditions. Construction would be dispersed over many locations, during different months, and over a 5-year time span. Cumulative effects of working at several sites at once would not be additive.

Construction activities would not violate the National or State Ambient Air Quality Standards for particulates of 60 micrograms per cubic meter (ug/m³), annual average, or 150 ug/m³ in a 24-hour period. The proposed action would not include any permanent stationary emissions sources and therefore would not be regulated by the Clean Air Act.

3.1.2.2 Mitigation. Construction specifications would require contractors to comply with all applicable Federal, State, and local air quality standards and emissions limitations adopted in accordance with provisions of the Clean Air Act. During construction, contractors would be required to use reasonable means to control and minimize atmospheric emissions of air contaminants. For instance, dust control measures by sprinkling could be required near inhabited areas.

3.2 WATER QUALITY

3.2.1 Existing Conditions

Water quality in the Yakima River Basin is good to excellent in the upper tributary reaches but is only fair to poor in the lower Yakima Valley [14]. From the headwaters to Roza Diversion Dam, the Yakima River passes through the Kittitas Valley with its agricultural, industrial, and urban developments. Livestock raising in this area and possibly inadequately treated municipal wastes may be the most important source of water pollutants. Water quality is degraded (by increases in temperature, fecal coliform bacteria, turbidity, and nutrients) as the river moves through this reach. However, overall water quality is still considered good as the river passes Roza Diversion Dam.

As the Yakima River flows through the middle Basin (Roza Dam to Sunnyside Dam), treated wastes from the communities of Yakima, Selah, Union Gap, and Terrace Heights, plus irrigation return flows from the Ahtanum and Moxee Valleys, are added. However, under average flow conditions, quality is degraded only slightly in this reach because Naches River flows of good quality and quantity are added and the volume of waste is small. Yakima River water quality is still considered good as it flows through Union Gap.

Water quality degrades rapidly in the lower Basin (Sunnyside Diversion Dam to the Columbia River). Not only is most of the summer flow diverted at Sunnyside and Wapato Dams, but a short distance downstream turbid, nutrient-rich, and bacteria-rich return flows begin making up a large portion of the riverflow. Return flows from agriculture are the major source of turbidity, nitrogen, phosphorous, and dissolved solid additions in this reach. High water temperatures preclude anadromous fish utilization during the summer months. At this point, the river also becomes unfit during summer and fall for most human water use activities.

Operation of the existing fish screens and passage facilities does not affect water quality conditions anywhere in the Basin.

3.2.2 Environmental Consequences

3.2.2.1 Proposed Action. In most cases, Phase II fish screen structures and juvenile fish bypass facilities would be constructed during the nonirrigation season when canals and ditches are dry. Under these circumstances, water quality would generally be unaffected by fish screen construction. Some situations could require that fish screens be constructed when canals were running water (canals run water year-round, winter weather prohibits access and construction, etc.) requiring that a bypass ditch be excavated around work sites. In these cases, an earthfill or sandbag cofferdam would be constructed upstream and downstream of new screen sites. In the process, digging, construction, and dismantling the cofferdams could cause temporary and short-term increases in canal water turbidity. It is doubtful, however, that this would result in increased turbidity in free flowing river sections, since any turbid water would remain in the irrigation network.

A bypass system for juvenile fish could be constructed or retrofitted at some of the 66 screen sites. The bypass system transports juvenile salmon and steelhead deflected by the fish screen through a pipe back to the stream of origin. The bypass outfall is located where this pipe empties into the river. Construction of the outfall structure would require earthfill or sandbag cofferdamming along the streambank to dewater the work area. Installation and removal of the cofferdam could cause minor and short-term instream turbidity increases, possibly above State standards. This construction activity would require authorization permits from the Corps of Engineers (Section 404 of the Clean Water Act), the Washington Department of Ecology (Water Quality Certification or Modification, Section 401 of the Clean Water Act), and the Washington Departments of Fisheries or Wildlife (Hydraulic Permit Approval). See permits discussion in Chapter 4. The proposed action would not require a National Pollution Discharge Elimination System permit under provisions of Section 402 of the Clean Water Act because these project activities would not create a point source of pollution.

After the new fish screens have become operational, removal of deposited silt would sometimes be required in canal sections near the fish screens. There would be no adverse water quality impacts associated with this maintenance routine, since the work would be done when canals are dry.

3.2.2.2 Mitigation. During the construction of juvenile fish bypass outfall structures, construction specifications would require the contractor to comply with all Federal, State, and local regulations designed to minimize water pollution. Section 404 permits, Section 401 Water Quality Certifications or Modifications, and Hydraulic Project Approval permits would stipulate that certain precautions be followed (best management practices) to reduce water quality degradation during construction. These requirements would be designed to reduce turbidity levels and prevent entry of petroleum products, cement, and other pollutants into water courses during construction.

3.3. VEGETATION/WETLANDS

3.3.1 Existing Conditions

The Yakima River watershed lies between two physiographic provinces, the Cascade Mountains and the Columbia Subbasin. These provinces and the region between exhibit a large variation in land elevation, topography, and climatic conditions. Likewise, plant communities include a variety of cover types from coniferous forests in the Cascade Mountains to irrigated cropland and dry shrub-steppe in lower Basin areas. Some Phase II screening projects would be built in coniferous forests in the upper Teanaway River. Principal overstory forest species include Douglas fir, ponderosa pine, hemlock, lodgepole pine, and western red cedar. Understory plants include Oregon grape, snowberry, blueberry, elderberry, pine grass, and sedge.

The drier shrub-steppe rangeland lies between forested slopes and croplands in lower valley areas. Predominant shrub-steppe plants include sagebrush, bitterbrush, rabbitbrush, cheatgrass, blue-bunch wheatgrass, Idaho fescue, lupine, and balsamroot. Often, irrigation canals are found traversing dry rangeland areas, fostering a rich mix of ditchbank riparian vegetation. The more woody riparian vegetation is composed of cottonwood, alder, willow, wild rose, and sumac. The canal bank plant community often includes sedges and rushes. Grasses and forbs normally found along irrigation ditches include reed canarygrass, redtop, bluegrass, mustard, thistle, cheatgrass, and sweetclover.

Most of the Yakima River Basin has been surveyed and classified for wetlands by the USFWS under the National Wetlands Inventory Program [11]. Yakima Valley wetland and riparian plant communities are found in association with rivers, streams, ponds, marshes, and swamps. Hundreds of miles of excavated irrigation conveyance systems, such as canals, ditches, wasteways, and drains, add significant amounts of artificial manmade wetland. Even though canals run water intermittently, canal banks can host a narrow but lush fringe of wetland/riparian vegetation, and normal canal leakage often allows establishment of small nearby wetland complexes. Executive Order 11990, Protection of Wetlands, requires Federal agencies to minimize the loss of or degradation of wetlands. Since fish screen facilities function in canals and ditches, some of the Phase II fish screens would be situated in wetlands. These wetland habitats are usually dewatered and growth dormant during the nonirrigation season. However, they flourish from one year to the next since wetted conditions are reestablished during the growing season.

After consultation with the USFWS under procedures of the Endangered Species Act, it was determined that no listed threatened or endangered plant species are located in Phase II project areas (see correspondence in Appendix B).

Economic development has centered around agriculture in the Yakima Valley. Irrigated crops cover about 500,000 acres of land, and the area is a major producer of agricultural products. Primary crops grown include apples,

cherries, peaches, pears, prunes, berries, asparagus, sugar beets, grapes, mint, grain, corn, hops, alfalfa hay and seed, and pasture grasses.

3.3.2 Environmental Consequences

3.3.2.1 Proposed Action. Whether construction activities involve upgrading certain components of an existing fish screen or total facility replacement, some level of vegetative disturbance would likely take place. Some work may include maintenance road improvement to provide better access for heavy construction equipment. Excavation at canal screen site locations and along the alignments of the juvenile fish bypass pipes would disturb ground surfaces. These work site construction activities could cause the destruction of ground-cover plants and require trimming or complete removal of some trees. Small work areas at the screen sites may be cleared of vegetation to accommodate the operation of construction equipment. Small areas of canal bank riparian vegetation could be disturbed during fish screen construction. Likewise, wetland plants, both in irrigation canals and adjacent to juvenile outfall structures at riverbank locations, could be affected for short periods during construction. Construction would often occur when riparian vegetation was in dormant condition during the nonirrigation season. Upon completion of construction and the return of canal waterflow, wetland plants would reestablish. Vegetation would not be permanently eliminated, and there would be no net loss of wetlands. The work would occur at small scattered work locations and over a 5-year period. As construction was finished at each location, excavated areas would be backfilled and disturbed ground would be graded to previous contour. Natural plant succession and reseedling, where necessary, would quickly restore disturbed sites to vegetative cover.

3.3.2.2 Mitigation. If construction resulted in work site soil and vegetation disturbance, reseedling of suitable grass and forb species would be required of the contractor to restore plant cover. Section 404 permits issued by the U.S. Army Corps of Engineers (Clean Water Act) and Hydraulic Permit Approvals issued by the Washington Departments of Fisheries or Wildlife would include permit conditions to protect affected wetland areas during construction. (Section 10 permits under the River and Harbor Act of 1899 would not be required).

3.4 FISH

3.4.1 Existing Conditions

3.4.1.1 Anadromous Fish. Anadromous fish stocks currently using the Yakima River Basin include spring and fall chinook salmon, coho salmon, and steelhead trout. The estimated spawning escapement of these stocks for the period 1980-1989 is shown in Table 3. The Basin's historic runs of summer chinook and sockeye salmon are now extinct.

**Table 3--Estimated Spawning Escapement of Anadromous Fish
in the Yakima River Basin, Washington, 1980-1989**

Year	Spring Chinook	Fall ^{a/} Chinook	Coho	Steelhead	Total
1980	1,120	50(E) ^{b/}	35(E)	<500(E)	<1,705
1981	1,120	50(E)	35(E)	<500(E)	<1,705
1982	1,250	85	35(E)	<500(E)	<1,870
1983	1,240	380	35	<500(E)	<2,155
1984	2,035	1,330	35(E)	360	3,760
1985	3,615	285	35	690	4,625
1986	6,820	1,215	230	1,380	9,645
1987	3,220	545	90	1,840	5,695
1988	2,510	220	45	2,460	5,235
1989	3,490	670	230	1,070	5,460

a/ Above Prosser Diversion Dam only. An estimated 1,500 fall chinook annually spawn in the Yakima River below Prosser Diversion Dam.

b/ (E) = estimate only; no count or redd data available.

Spring chinook salmon spawn and rear in the Yakima River and its tributaries above Sunnyside Dam and in the Naches River and its tributaries. In the Naches drainage, spawning can occur as early as mid-July but occurs most commonly in August. In the upper Yakima River drainage, spawning most often occurs during mid-to late-September. The eggs remain buried in gravel throughout the winter, and the fry emerge in early March. Juvenile fish remain in the river throughout summer and the following winter. During spring runoff, they migrate to the ocean, with peak numbers noted passing Prosser Dam from mid-April to mid-May.

It is generally believed that two substocks of spring chinook occur in the Yakima Basin--a Naches substock and an upper Yakima substock. The Naches substock spawns earlier than the upper Yakima substock (early to late August versus mid-to late-September in the upper Yakima) and has a greater percentage of returning 5-year-old spawners (40 percent versus 5 percent). Spawning adults in the Naches system are therefore generally larger and lay more eggs per spawner than those in the upper Yakima system.

Fall chinook salmon spawn in the Yakima River downstream from Sunnyside Dam to the confluence with the Columbia River and in Marion Drain. This is an "upriver bright" stock native to the Basin. Spawning occurs from late-October through November, and the eggs remain in the gravels throughout the winter. Fry emerge from the gravels in late April and early May and begin drifting downstream. The fry continue to move downstream to the Pacific Ocean, arriving at the Columbia River estuary in late July and August.

Natural runs of summer chinook and coho salmon are now essentially extinct in the Yakima Basin. A small remnant run of coho has been passing Prosser Dam from 1983-88, but these are probably early run coho planted in the early 1980's. Suitable habitat occurs in the Basin for both stocks--summer chinook could utilize the Yakima River between Roza and Sunnyside Dams and the lower Naches River for spawning; coho could utilize the upper Yakima River and its tributaries and the upper Naches River and its tributaries for spawning and rearing.

Sockeye salmon occurred historically in the accessible natural lakes in the Basin such as Cle Elum, Kachess, Keechelus, and Bumping before their outlets were dammed. Sockeye spawn in either lakes or their tributaries. After the fish hatch, they then do their rearing in lakes. The run disappeared shortly after the lake outlets were blocked, restricting their migration. The principal migration period of adults was the summer months. The landlocked form of the sockeye salmon, the kokanee salmon, is presently found in most Yakima Basin reservoirs and provides an especially important fishery in Rimrock Lake.

Steelhead trout are a type of rainbow trout that spawn in freshwater but spend some time rearing in the ocean like salmon. Yakima Basin steelhead are summer run stock that spawn and rear in the Yakima and Naches Rivers and their tributaries above Sunnyside Dam and in upper Satus and Toppenish Creeks on the Yakima Indian Reservation. Spawning occurs in April and May, and the fry emerge from the gravels in June and July. The juvenile fish rear in the Basin for 1 or 2 years and migrate downstream to the ocean in late April and May.

The Yakima River steelhead stock is native to the Basin, but some limited interbreeding with introduced hatchery fish has probably occurred. Steelhead, unlike salmon, may spawn more than once and return to the ocean after each spawning. However, very few Yakima River steelhead are able to survive the difficult trip to the ocean and back for a second spawning.

Table 4 shows species and life stages of anadromous fish present in the Yakima River Basin in each month. In the Yakima River system, adult spring chinook salmon move upstream from mid-April to mid-August, and adult coho salmon move upstream from early September to early November. Adult fall chinook move upstream from late September through early December. Adult steelhead trout move upstream from early September to early December and again from early March to early June; occasional upstream movement occurs during the other months of the year. Steelhead, chinook, and coho smolts move downstream between early March and late June. With the exception of fall chinook, which begin their downstream movement as soon as the fry emerge in spring, juvenile rearing of these species occurs in the Yakima River Basin throughout the year.

Under current fishery management programs, smolt releases of hatchery summer steelhead and coho and fall chinook salmon are conducted each year to supplement natural production. From 1977 through 1989, annual steelhead releases ranged from 49,289 to 108,630 fish; from 1982 to 1989, coho releases were between 53,820 and 800,000 fish (except 0 in 1984); and for the years

Table 4—Anadromous Fish Migration and Life Stages
Present in the Yakima River Basin

↑ = upstream migration (adults) ↓ = downstream migration (juveniles)
○ = egg incubation x = juvenile rearing
* = spawning

Months												Fish Stock (area)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
												Fall Chinook (below Sunnyside Diversion Dam)
oooo	oooo	oooo	oooo	o					↑	↑↑↑↑	↑↑↑↑	
		↓↓↓	↓↓↓	↓↓↓	↓↓↓					o	oooo	oooo
												Spring Chinook (above Sunnyside Diversion Dam)
oooo	oooo	oooo		↑↑	↑↑↑↑	↑↑↑↑	↑↑↑↑	↑↑↑↑	↑↑			
xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	o	oooo	oooo	oooo	oooo	oooo
		↓↓↓	↓↓↓	↓↓↓	↓↓↓		xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
												Steelhead Trout (Satus and Toppenish Creeks and above Sunnyside Diversion Dam)
↑↑	↑↑	↑↑↑↑	↑↑↑↑	↑↑↑↑	↑↑	↑↑	↑↑	↑↑↑↑	↑↑↑↑	↑↑↑↑	↑↑	
xxxx	xxxx	xxxx	oooo	oooo	oooo	oooo		xxxx	xxxx	xxxx	xxxx	xxxx
		↓↓↓	↓↓↓	↓↓↓	↓↓↓							
												Coho Salmon (upper Yakima and Naches Rivers)
oooo	oooo	o						↑↑↑	↑↑↑	↑↑↑		
xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	oo	oooo	oooo	
		↓↓↓	↓↓↓	↓↓↓	↓↓↓					xxxx	xxxx	xxxx
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

1977 to 1989, fall chinook hatchery plants ranged from 729,097 to 4,017,500 fish [1,12]. Spring chinook hatchery supplementation was discontinued after 1987 and will not be reinstituted until the proposed Yakima-Klickitat hatchery, rearing, and acclimation facilities come online.

As discussed in the Purpose and Need section of Chapter 1, the 66 irrigation diversions proposed constitute a major hazard to salmon and steelhead fry and smolt unless modified by the Phase II fish passage project.

3.4.1.2 Resident Fish. Cold-water resident gamefish habitat is abundant in the upper Yakima and Naches Rivers where rainbow, cutthroat, brook, and Dolly Varden trout and mountain whitefish naturally reproduce. A popular wild rainbow trout sport fishery has developed in the mainstem Yakima River from Easton Diversion Dam (R.M. 202.5) downstream to Roza Diversion Dam (R.M. 127.9). The Washington Department of Wildlife stocks hatchery rainbow trout in the Naches River. In the lower Yakima River below Sunnyside Diversion Dam (R.M. 103.8), where water temperatures are warmer and water quality conditions are degraded, smallmouth bass, yellow perch, black crappie, and channel catfish are found.

Nongame fish species found in the Yakima River Basin include northern squawfish, bridgelip and large-scale suckers, redbelly shiner, longnose and speckled dace, mottled sculpin, carp, and chiselmouth.

There are no federally listed threatened and endangered fish species (Endangered Species Act) in the Yakima River Basin (see Service memorandum in Appendix B).

3.4.2 Environmental Consequences

Proposed Action. Anadromous fishery improvement objectives and strategies have recently been developed under the Yakima River Subbasin planning process [1]. The draft Yakima River Subbasin Plan, along with 30 other Columbia River subbasin plans, was released for public review in September 1989. In the Yakima Plan, alternative strategies for the enhancement of steelhead, coho, spring chinook, and fall chinook and for the reintroduction of summer chinook included:

- constructing new hatchery and supplementation facilities
- opening additional habitat
- reducing Yakima River juvenile fish losses by predation
- providing new off-channel winter fish rearing refuges
- rescreening and power subordination at Wapatox powerplant
- riparian habitat restoration
- reducing mortality of prespawning adults
- rebuilding fish screens under the Phase II program

Yakima River Subbasin planners utilized two computer models developed by the Council's Monitoring and Evaluation Group to estimate the fish benefits associated with implementing the various fishery improvement strategies mentioned above. Benefits were estimated in terms of expected adult fish returns and harvest levels. The models used for this effort were labeled the Tributary Parameter Model (TPM) and the System Planning Model (SPM). The TPM and SPM could be used by planners to simulate and predict the incremental net fish returns associated with implementing each individual strategy. Table 5 shows the fishery benefits that the TPM and SPM projected for completing the Phase II screening program.

Table 5--Net Annual Anadromous Fishery Benefits Attributable to the Yakima River Basin Phase II Fish Screening Program

Species	Adult Returns to Yakima River Mouth	Yakima River Terminal Harvest Level	Effective Spawning Escapement Level */	Total Harvest (ocean, estuary, Columbia and Yakima Rivers)
Numbers of Fish				
Spring chinook	2,384	1,726	525	2,269
Summer steelhead	2,908	1,880	927	2,466
Summer chinook	574	499	60	709
Coho	459	414	5	1,471
Total	6,325	4,519	1,517	6,915

*/ These numbers have been adjusted for prespawning mortality Source: From Yakima River Subbasin Plan [1]

The benefits in Table 5 show the results of improved salmon and steelhead presmolt and smolt survival from upgrading the Phase II fish screen sites with state-of-the-art fish protective facilities. The proposed action would increase the numbers of young fish that reach the ocean environment. In turn, more adult spawners destined for the Yakima River would be expected. As depicted above, greater numbers of salmon and steelhead would also be intercepted and harvested in ocean, estuary, and Columbia River commercial, sport, and Tribal fisheries before spawners actually reached the Yakima River. Most harvest improvement would, however, be derived in the Yakima River itself where an estimated additional 4,519 fish would be taken in sport and Tribal fisheries. Fall chinook production would not increase from the proposed action because adult spawning and juvenile rearing for this species occurs downstream of all but two of the irrigation diversions under Phase II evaluation [13].

The Phase II screening program would also benefit resident fish species by reducing juvenile fish losses at irrigation diversions. These benefits cannot be quantified, but the proposed action should result in improved survival of resident gamefish.

3.5 WILDLIFE

3.5.1 Existing Conditions

Wildlife species found at Phase II project locations are dependent on habitat provided by rivers and streams and the extensive network of irrigation canals and drain ditches found throughout the Yakima Basin. Wildlife associated with these areas utilize valuable riparian habitats for forage, escape cover, winter cover, reproduction locations, and migration corridors. Adjacent cropland areas also provide forage and cover and add to wildlife habitat diversity.

Wildlife found in the upper Basin, higher elevation areas of the Teanaway, Naches, and Tieton Rivers drainages are associated with riparian/forested vegetation types. Important species include Rocky Mountain elk, mule deer, coyotes, mink, raccoon, river otter, pine marten, red squirrel, chipmunks, goshawk, great horned owl, golden eagles, bald eagles, and a variety of nongame birds such as ravens, chickadees, nuthatches, and woodpeckers.

Further downstream at lower elevations and along the mainstem of the Yakima and Naches Rivers, wildlife populations utilize the available mix of riparian and agricultural habitats. Popular gamebird species include ring-necked pheasant, mourning dove, quail, mallard duck, and Canada goose. Common furbearers are the beaver, mink, muskrat, and raccoon. Bald eagles are frequently found in the wintertime (see Threatened and Endangered Species). A large variety of waterfowl, raptor species, and passerine birds seasonally use river and canal wetland habitats.

3.5.2 Environmental Consequences

3.5.2.1 Proposed Action. Phase II construction activities would likely disturb nearby wildlife. Workers and noise from equipment operations would disturb wildlife and cause animals to disperse to other areas. Limited amounts of vegetation could also be eliminated at some sites from construction activities, which could reduce wildlife habitat. However, construction work would be of a temporary nature, ranging from a few days to a few months. Only small amounts of habitat around the immediate location of the fish screens and along juvenile fish bypass pipe alignments would be removed by construction. At any one time, the work would be dispersed at several sites and over a large area of the Yakima Basin. Further, construction at each of the 66 sites would be staggered and scheduled over a 5-year period. As a result, impacts of implementing the Phase II screening program on wildlife species would not be considered significant or cumulative. Wildlife would return once construction was completed. Vegetation mitigation, where necessary, would hasten the restoration of wildlife habitat.

3.5.2.2 Mitigation. Where vegetation disturbance from onsite construction activities occurs, reseeding would be conducted to accelerate the regrowth of plant cover and the return of wildlife habitat. State, Federal, and Tribal fish and wildlife authorities would be consulted to develop the most desirable vegetation treatments and seeding mixtures.

3.6 THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN

3.6.1 Existing Conditions

In compliance with Section 7 of the Endangered Species Act, the USFWS was contacted in December 1989, about federally listed threatened and endangered plant and animal species that might occur in the project area. The Washington Department of Wildlife was also contacted to determine if other "state species of concern" could be affected by the Phase II screening program. Appendix B contains correspondence with these agencies. The bald eagle is threatened in Washington and was the only federally listed species provided by the USFWS at that time. The USFWS provided Reclamation with a general description of areas where bald eagle use is known.

Recently the spotted owl has been added to the list of threatened species in Washington by the USFWS. The Washington Department of Wildlife also listed the spotted owl as a state endangered species (located near No. 44 Anderson) and a number of other insect, animal, and fish species in the Yakima Basin that are under evaluation for possible future listing as state species of concern.

Limited numbers of bald eagles winter in the bottomlands of the Yakima and Naches Rivers and use trees in the riparian zone for roosting, resting, and hunting perches. Overall, however, the Yakima Basin is not considered a major wintering area for bald eagles. Data from the midwinter bald eagle survey for the Yakima Basin and all of eastern Washington for the period 1982 through 1989, are shown in the Table below [14,15].

**Table 6--Midwinter Bald Eagle Survey Data,
Yakima Basin and Eastern Washington, 1982-1989**

Year	Yakima Basin	Eastern Washington Total	Percent Occurring in Yakima Basin
1982	5	314	2
1983	3	270	1
1984	34	379	9
1985	33	450	7
1986	20	411	5
1987	27	419	6
1988	36	539	7
1989	39	496	8

3.6.2 Environmental Consequences

3.6.2.1 Proposed Action. A Biological Assessment was prepared on both the bald eagle and spotted owl and sent to the USFWS for their concurrence on January 16, 1991. Through development of the Biological Assessment it was determined that the bald eagle and spotted owl would not be affected by the proposed actions. The USFWS in a February 11, 1991, letter concurred with the findings that implementation of the proposed actions are not likely to adversely affect the spotted owl or bald eagle, providing the conservation measures identified in the Biological Assessment are fully implemented (see Mitigation Measure 3.6.2.2).

There is a spotted owl nest site about 1.8 miles from project site 62 on the Cle Elum Ranger District. Due to this distance between nest site and project activities, no affect will occur to the spotted owl. There is also a spotted owl nest about 1/2 mile from project site 44 on the Naches Ranger District. The project site on the Naches Ranger District is located in an area with residential housing and human activity. Because of both the distance between the nest site and the project activities, as well as the ongoing residential activities associated with the area surrounding the project site, there will be no affect to the nest or the spotted owls habitat or forage area. There are no known spotted owl nests near (within miles) of any of the other project sites in the Phase II project area. No nesting or foraging areas will be disturbed, nor will there be an adverse impact on any of the populations of prey species which the spotted owl relies on for food. Therefore, there will be no adverse effects to nesting spotted owls as a result of implementation of the Phase II project.

There are no known bald eagle nest sites that would be affected by the proposed project. The only known bald eagle nest within the entire Yakima Basin is near Rimrock Lake, approximately 13 miles from the nearest project site, number 63. There are no known roost sites near any of the project sites. No winter census data is available for this area.

Observations by both the U.S. Forest Service and Reclamation indicate that bald eagles winter in various locations throughout the Yakima Basin. Surveys to ascertain locations of wintering bald eagles a year prior to construction scheduled for the winter period will be performed by Reclamation. If results of the survey reveal bald eagles wintering in the vicinity of the proposed projects, the USFWS will be consulted on measures to minimize the possibility of adversely affecting the eagles. Implementation of Phase II will increase numbers of anadromous fish in the Yakima Basin, which will provide an increase in available prey for wintering bald eagles and will provide long-term benefits to bald eagle populations.

With the provisions Reclamation has described in the Biological Assessment to: (1) survey wintering bald eagle populations; (2) obtain updated spotted owl nesting information; and (3) consult with the USFWS should the results of new information warrant, we conclude that there will be no adverse effect on the spotted owl or the bald eagle as a result of the proposed project.

During construction work, Reclamation would avoid affecting the various Washington State species of concern to the extent possible. By law, these

species do not have the same legal protection status as federally listed threatened and endangered species.

3.6.2.2 Mitigation Measures. Reclamation will contact the USFWS for new information on spotted owl locations a year before beginning construction on each new group of projects. If new information indicates that spotted owls may occur in the vicinity of any proposed project, Reclamation will consult with the USFWS on measures to minimize impacts to the species.

Reclamation will perform wintering bald eagle surveys, in accordance with the survey protocol described in the Biological Assessment, a year prior to construction of each group of projects scheduled for the winter construction period. If the surveys reveal bald eagles wintering in the vicinity of the proposed projects, Reclamation will consult with the USFWS on measures to minimize project-related impacts on the species.

3.7 CULTURAL RESOURCES

3.7.1 Existing Conditions

The earliest fish screens in the Yakima River Basin date from the mid- to late-1920's. Most of the screens scheduled for modifications date to the late 1930's when the Works Projects Administration (WPA) coordinated efforts with the WDF to install screens. The program continued until about 1942, when it was terminated by the onset of World War II. Fish screens went untended during the war; many were removed by farmers and irrigation districts seeking to maximize diversion flows and crop yields. After the war, the State returned to the task of enhancing fish runs. Assessments made in 1946, led to repair and reinstallation of many of the WPA screens. Some screens retained their essential appearance and operational character, but many were changed at that time. Those retaining significant amounts of their original integrity (that is, characteristics dating to the 1930's era or earlier) may be eligible for inclusion in the National Register of Historic Places. It is unlikely that screens seriously modified in the late 1940's, and those dating from more recent times, could be National Register eligible.

The irrigation facilities in which the screens are located may also be National Register eligible. The vast majority of fish screens are located within privately built and owned canals and ditches, served by diversion dams and headgates also constructed by private entities. No context for National Register eligibility has been established by the State Historic Preservation Officer for such properties. Three of the screens within the Yakima-Tieton Irrigation District have been determined eligible for inclusion in the National Register; other federally constructed and owned facilities not included in the present project have also been determined eligible.

A number of Federal laws and regulations have been promulgated to protect the nation's historical, architectural, and prehistoric resources. Also protected are sites of traditional cultural or religious value to Native Americans. These authorities include the National Historic Preservation Act, the Archaeological Resources Protection Act, the American Indian Religious Freedom Act, the National Landmarks Program, and the World Heritage List.

The National Historic Preservation Act and the Archaeological Resources Protection Act safeguard historical and archeological resources from damage or removal from Federal and Indian lands. The American Indian Religious Freedom Act assures that Federal activities do not impair access to religious sites and will not affect ceremonial rites of American Indians.

3.7.2 Environmental Consequences

3.7.2.1 Proposed Action. Cultural resource files in the Washington State Office of Archaeology and Historic Preservation have been consulted in compiling information on previously recorded cultural resources within the general vicinities of the 66 screen sites [18]. This constitutes a Class I survey. On-the-ground cultural resource surveys have been conducted at some of the 66 project site locations. The data base is considered incomplete until the sites have been surveyed. Representatives of the Yakima Indian Nation will be consulted regarding traditional use and religious significance of each of the 66 fish screen locations.

With proposed action implementation, there is a possibility that cultural resources such as historic fish screens, historic irrigation facilities (including canals, ditches, diversion dams, and headgates), prehistoric archeological sites, and other historic properties could be affected. Both direct and indirect impacts could adversely affect the resources. Alteration of appearance or function, removal, or isolation of structures by construction of new waterways bypassing the historic facility could constitute adverse effects. Ground disturbance caused by construction, and installation of new equipment or building improved access roads to screen sites, could affect archeological sites.

3.7.2.2 Mitigation. Pursuant to the National Historic Preservation Act as implemented under 36 CFR 800, the effects of any Federal undertaking on historical, cultural, or archeological resources must be evaluated. For properties on or eligible for the National Register of Historic Places, BPA and Reclamation would consult with the State Historic Preservation Office and the Advisory Council on Historic Preservation regarding any potential adverse effects and means to mitigate those effects.

Prior to beginning construction, all areas that would be affected by the project construction activities would be surveyed for cultural resources and measures would be taken to eliminate those impacts. Screens and the irrigation facilities in which they are located would be assessed for their historical significance. Those screens and irrigation facilities less than 50 years old would not be evaluated, as they are not likely to be of exceptional significance and are not eligible for inclusion in the National Register of Historic Places.

3.8 SOLID WASTE AND HAZARDOUS MATERIALS MANAGEMENT

3.8.1 Existing Conditions

Solid waste products are not generated during operation or maintenance of the existing fish screen facilities identified for the Phase II program. These screens do require periodic application of lubricants on paddle wheel and drumscreen shaft bearings.

Under maintenance procedures, grease guns are used to apply lube grease through zerk fittings. Such routine maintenance does not threaten or add toxic compounds to the environment [16,17]. Operating fish screen drive chains continually pass through an oil bath to maintain rust-free and lubricated chains. This lubricating oil does not normally come in contact with flowing water because it is contained in sealed metal reservoir units. None of the 66 Phase II sites are located on a known hazardous materials site.

3.8.2 Environmental Consequences

3.8.2.1 Proposed Action. As with the existing conditions, operation and maintenance of the new fish screen facilities under the Phase II program would not cause solid or hazardous waste materials to accumulate in the environment. In the unlikely event that lubrication chain oil would escape to a water body of the U.S. (creating any amount of sheen on the water surface), Clean Water Act regulations would require reporting to the U.S. Coast Guard for possible cleanup actions.

During Phase II construction activities, there would be no use of hazardous materials. Rubbish, concrete forms, refuse, and other solid waste materials may accumulate at fish screen work sites during construction.

3.8.2.2 Mitigation. Hazardous waste inventories would be conducted at each Phase II site prior to fish screen construction. These surveys would be conducted by Reclamation and BPA personnel to assure that the sites are not contaminated with hazardous waste materials.

Provisions would be put in construction contract specifications to require maintenance of an orderly and neat work area, and the contractor would be allowed to dispose of solid waste materials only at approved dump locations.

3.9 NOISE

3.9.1 Existing Conditions

Existing ambient noise levels at the Phase II fish screen project locations are typically associated with sounds generated in the natural and rural environments. Natural background sounds include wind, flowing water, birdlife, and domestic livestock and animals. Human-caused noises originate from overhead aircraft, vehicular traffic on nearby highways and country roads, and farm machinery operation.

3.9.2 Environmental Consequences

3.9.2.1 Proposed Action. The localized noise setting would be slightly affected during construction activities. Given the rural character of most project locations, it is unlikely that residents would be distracted from the short-term and intermittent operation of machinery at the work sites. Engine noise from construction equipment operation (dump trucks, concrete trucks, backhoes, boomtrucks, and excavators) would be heard, but only from relatively short distances from the actual work site. Local wildlife would move away from work locations partly due to construction noise. However, project sites would generally be isolated, at different locations spread over a large geographical area, during different time periods, and often noise would be muffled by vegetation and topography. After construction, noise levels would be the same as before. Because of the low noise levels during and following construction, effects of the project on noise would be within Federal guidelines as defined by the Noise Control Act.

3.9.2.2 Mitigation. During construction, the contractor would be required to comply with applicable Federal, State, and local laws and regulations concerning the prevention, control, and abatement of excessive noise.

3.10 LAND USE/FLOODPLAINS

3.10.1 Existing Conditions

Of the 66 sites considered for inclusion in the Phase II fish screening program, 40 are located in Yakima County, 25 in Kittitas County, and one in Benton County. Three screen sites are on Snoqualmie National Forest lands (No. 43 Emerick, No. 44 Anderson, and No. 63 Yakima-Tieton). Five are on the Yakima Indian Reservation (No. 23 WIP-Toppenish Pump, No. 41 Holwegner, No. 64 Shattuck, No. 65 WIP-Lower, and No. 66 WIP-Upper). One, the No. 26 Congdon site, is located in Eschbach Park which is operated by Yakima County. The other 57 sites are on privately owned properties or lands withdrawn by Reclamation for irrigation project purposes.

Virtually all project sites are located on existing irrigation diversion canals or ditches. Typically the sites are found in or near undeveloped natural river bottom areas or on rural lands that are associated with agricultural-type land uses. The Intergovernmental Cooperation Act of 1968 (42 USC 4231(c)) and Executive Order 12372 require coordination of any federally assisted programs with State and local planning authorities. At this time, county zoning designations have not been determined for all of the Phase II project sites, but it is likely that most zoning is agricultural or rural in nature. The Kittitas, Yakima, and Benton Counties officials contacted [7, 8, 9] have indicated that modification of existing fish screens or construction of new ones would be interpreted as an agriculture-related land use that would be permitted under present county zoning regulations. Given this interpretation, it was also concluded that construction of the fish screen facilities would be exempt from county permitting under the Washington State Shoreline Management Act.

Executive Order 11988, Floodplain Management, requires Federal agencies to protect and minimize effects to floodplain environments and human populations whenever feasible. The U.S. Army Corps of Engineers has completed floodplain and floodway mapping in the Yakima Basin. Flood Insurance Rate Maps (as developed under the National Flood Insurance Program) have not been examined to explicitly determine which project sites would be situated within floodplain locations. Due to the fact that irrigation facilities divert water from rivers, it is likely that portions of the Phase II activities such as placement of new bypass structures would be located in the Yakima River's 100-year flood zone.

The U.S. Soil Conservation Service has completed soil surveys of much of the irrigated cropland in the Yakima Basin. Much of this land has been classified as prime and unique farmlands as outlined in the Council on Environmental Quality Memorandum, analysis of Impacts on Prime and Unique Farmlands (45 FR 59186, September 8, 1980). Prime farmlands are those whose value derives from their general advantage as cropland due to soil and water conditions. Unique farmlands are those whose value derives from their particular advantages for growing specialty crops. It is likely that many of the Phase II sites are located on canals adjacent to such cropland areas.

None of the Phase II sites are located within the coastal zone of Washington, and they would be unaffected by the Washington State Coastal Zone Management Program. No established U.S. Forest Service or BLM Wilderness Areas would be impacted nor would any BLM Areas of Critical Environmental Concern. The proposed screens would not be located in close proximity to any designated Wild and Scenic Rivers or National Recreational and Scenic Trails sections.

3.10.2 Environmental Consequences

Proposed Action. It is unlikely that implementation of the Phase II fish screen program would impact existing land uses significantly. This would particularly be the case where existing facilities were merely upgraded or slightly modified. Even if a screen facility was moved to another canal location, it would not normally affect adjacent land uses due to the small size of the structure. Some small parcels of cropland could be temporarily disturbed during fish screen or bypass pipe installation. But, no cropland areas are planned to be converted or lost as a result of the project. Therefore, no agricultural lands classified as prime or unique farmlands would be permanently changed to other land uses.

County or Yakima Indian Reservation authorities would be contacted prior to construction at each of the 66 sites. If deemed necessary, zoning permit or special land use applications would be made to county or Yakima Indian Reservation jurisdictions. This would assure compatibility with local land use planning.

Where fish screen projects would be located within the designated floodway or 100-year floodplain, certain design restrictions or limitations would apply. County authorities and the Federal Emergency Management Agency would be

contacted to assure that any fish screen modifications or new construction would not alter floodplain characteristics or channel flow capacity. If facilities are located within the floodplain, they would be designed to withstand flooding. The proposed project would be compatible with Executive Order 11988. The program would restore and enhance a natural ecological component of the floodplain, the anadromous fish population. Overall, the proposed project activities would not adversely impact human life, property, or natural floodplain values.

CHAPTER 4

ENVIRONMENTAL REVIEW AND PERMIT REQUIREMENTS

This chapter discusses how the proposed project would comply with Federal, State, and local laws, regulations, authorities, and permit requirements.

4.1 FEDERAL

4.1.1 National Environmental Policy Act (NEPA) 42 U.S.C. 4321 et seq.

This Act and implementing regulations provide for federally sponsored actions or projects to be evaluated from an environmental perspective to adequately determine impacts on the quality of the human environment. Using this information, a determination will be made as to whether the proposal will affect the environment significantly and an Environmental Impact Statement is required, or the proposal will not have significant impacts and a Finding of No Significant Impact will be prepared.

4.1.2 Endangered Species Act 16 U.S.C. 1531 et seq.

This Act provides for the conservation of plant and animal species that are currently in danger of extinction (endangered) or those that are likely to be so in the foreseeable future (threatened). Section 7 of this Act requires consultation with the USFWS to determine potential project impacts on threatened and endangered species. Section 7 consultation has been completed on the proposed action. The bald eagle and the spotted owl are the only federally listed species that could be affected (see Section 7 correspondence in Appendix B). A Biological Assessment was prepared. A determination was made of no effect and this finding was concurred by the USFWS.

4.1.3 Fish and Wildlife Coordination Act 16 U.S.C. 661 et seq.

The purpose of this Act is to provide that wildlife receive equal consideration and be coordinated with other features of water resource development programs. To date, impacts to fish and wildlife of the Phase II screening program have been evaluated in consultation with the USFWS and the Washington Departments of Fisheries and Wildlife.

4.1.4 Executive Order 11990, Protection of Wetlands

Under this directive and in carrying out resource management programs, all Federal agencies are to take actions that will minimize the destruction, loss, or degradation of wetland areas. Some riparian/wetland type vegetation could be temporarily disturbed at fish screen construction sites, but the Yakima Phase II Fish Screens program would cause no net loss to wetland habitats in the Yakima Basin.

4.1.5 Executive Order 11988, Floodplain Management

This executive order requires that Federal agency program management reduce the risk of floodplain losses; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. In planning and designing for Phase II fish screen construction, local, county, and Tribal land use jurisdictions and the Federal Emergency Management Agency would be consulted to assure that the proposed facilities would be built in such a way so as not to increase the likelihood of flood damage. The proposed project activities would not adversely impact human life, property, or natural floodplain values.

4.1.6 Clean Water Act 33 U.S.C. 1251 et seq.

The goal of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." During construction of the juvenile fish bypass outfall structures, some minor temporary increases in water turbidity could result from cofferdam placements in the Yakima River and tributaries. Under Section 404 of the Clean Water Act, Reclamation would be required to secure permits from the U.S. Army Corps of Engineers to authorize inriver work and discharge of fill materials below the ordinary high water line. Under Section 401, Reclamation would concurrently acquire water quality certification or modification approval from the Washington Department of Ecology to assure compliance with the State's water quality standards. Section 404 permits would not be required for fish screen construction in irrigation diversion canals because there would be no inriver work and discharge of fill materials below the ordinary high water line.

4.1.7 Federal Land Policy and Management Act

This authority requires that right-of-way reservations be secured for any fish screen facilities (including powerlines) or permanent access roads located on Federal land under administration of the Departments of Agriculture (U.S. Forest Service) or Interior (Reclamation). Only a few of the 66 screen sites are presently located on federally owned properties.

4.1.8 Heritage Conservation

A number of Federal laws and regulations have been promulgated to protect the nation's historical, cultural, and prehistoric resources. These include the National Historic Preservation Act, the Archeological Resources Protection Act, the American Indian Religious Freedom Act, the National Landmarks Program, and the World Heritage List.

The National Historic Preservation Act and the Archeological Resources Protection Act safeguard historical and archeological resources from damage or loss due to federally sponsored or permitted projects and from excavation or removal from Federal and Indian lands. The American Indian Religious Freedom Act assures that Federal activities do not impair access to religious sites and will not affect ceremonial rites of American Indians.

Pursuant to the National Historic Preservation Act, the effects on historical, cultural, or archeological resources of any Federal or federally assisted undertaking must be evaluated. For properties on or eligible for the National Register of Historic Places, the responsible Federal agency must consult with the State Historic Preservation Office (SHPO) regarding any potential adverse effects on resources of historic, architectural, archeological, or cultural significance.

4.2 REQUIREMENTS NOT APPLICABLE TO THIS PROPOSAL

In addition to the responsibilities under NEPA, Federal agencies are required to carry out provisions of many other Federal environmental laws. Many do not apply to this proposal because the proposal will not affect the area of concern in the individual laws. Subject areas and laws are listed below.

4.2.1 Permits for Discharges Into Waters of the U.S.

A national pollution discharge elimination system permit is issued if any pollution is discharged into the waters of the U.S. This program will not require any discharges into the water.

4.2.2 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA), 42 U.S.C.A. § 6910 et seq., was passed in 1976 and amended several times. This legislation regulates the handling, storage, and disposal of solid and hazardous waste. No chemicals or waste products will be used or produced.

4.2.3 Federal Insecticide, Fungicide, and Rodenticide Act

Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C.A. § 136 et seq., was passed in 1982, and has since been amended several times. The Act regulates the handling and application of pesticides. No pesticides will be used in this program.

4.2.4 Toxic Substances Control Act

The Toxic Substances Control Act, 15 U.S.C.A. § 2601 et seq. regulates the manufacture and, to some extent, the use of toxic substances. No toxic substances will be manufactured or used in this program.

4.2.5 Energy Conservation at Federal Facilities

The Energy Conservation Policy, 42 U.S.C.A. § 8241 et seq., was passed in 1978. The goal of this legislation is to "promote the use of energy conservation, solar heating, and cooling, and other renewable energy sources in Federal buildings." No Federal buildings will be constructed for this program.

4.2.6 Global Warming

This program will not generate gases that may affect global warming.

4.3 STATE

4.3.1 State Environmental Policy Act (SEPA)

This act was implemented to ensure that Washington State decisionmakers would consider the environmental impacts of proposed projects. This EA is being prepared pursuant to the NEPA, Federal legislation that is analogous to SEPA. Therefore, the Washington State policy that environmental impacts must be considered would be satisfied by this NEPA documentation process.

4.3.2 Hydraulic Project Approval (HPA)

Any project involving work within Washington State stream courses requires strict consideration of impacts on fish and wildlife resources. Through issuance of HPA's, the Washington Departments of Wildlife and Fisheries reviews impacts of such projects. The Departments can require that certain construction procedures be followed. Fish and wildlife habitat mitigation can also be required. In many cases, Phase II fish screen projects would include streambank construction of new juvenile bypass outfall structures in free flowing sections of the Yakima, Teanaway, Naches, and Tieton Rivers. This work would require that HPA's be issued to assure protection of fish and wildlife resources.

4.3.3 Water Quality Certification

Section 401 of the Clean Water Act requires that any Federal action that results in a discharge into water bodies must comply with the respective State's water quality standards. Pursuant to meeting this requirement, and in conjunction with applying for HPA's and Section 404 approval, Reclamation would submit "Water Quality Certification or Modification" applications to the Washington Department of Ecology. The Department of Ecology will review these applications and issue certification orders. In consideration of reducing water quality impacts, certain conditions will be included in the orders to reduce construction related water quality impacts.

4.4 LOCAL

4.4.1 Compliance With County Comprehensive Plans, Zoning, and the Shoreline Management Act

Discussions with officials from Benton, Yakima, and Kittitas County Planning Departments indicate that the proposed Phase II projects would comply with or be exempt under county planning, zoning, and shoreline management programs. Prior to construction of fish screen facilities, county land use authorities

would be contacted to assure adherence to local land use ordinances and requirements. Most locations where the proposed work would be conducted are zoned for agricultural land uses. County government authorities contacted to date have concluded that fish screen installations or modifications would be considered an agricultural use and be exempt from the need for zoning permits. Likewise, the construction or modification of irrigation system facilities and any appurtenant fish screen facilities would be exempt under the Shoreline Management Act.

4.4.2 Yakima Indian Nation

There are five fish screen projects located within the boundaries of the Yakima Indian Reservation, WIP-Toppenish Pump (No. 23), Holwegner (No. 41), Shattuck (No. 64), WIP (No. 65), and WIP (No. 66). These are the only Phase II facilities to be built on irrigation diversions that are presently unscreened. Construction would be fully coordinated with the Yakima Indian Reservation and the Wapato Irrigation Project, which operates these irrigation diversions.

4.4.3 Easements and Rights-of-Way

Most of the structures under the Phase II program would be located on private properties. Easement agreements would be required with the landowners to gain access during construction and to perform long-term operation and maintenance of the fish screen facilities. Additionally, utility powerline rights-of-way may be needed for service power to run fish screen electric motors.

CHAPTER 5

CONCLUSIONS

Implementation of the Yakima Basin Fish Passage Project - Phase II would significantly improve the production of anadromous fish in the Yakima River system. The project would provide offsite mitigation and help to compensate for lower Columbia River hydroelectric fishery losses. It is consistent with the Council's goal to double salmon and steelhead runs. The region's commercial, sport, and Tribal fisheries in the ocean, the mainstem Columbia River, and Yakima River would benefit from the project. The Phase II screens would allow greater numbers of juvenile anadromous fish to survive. As a consequence, there would be higher returns of adult salmon and steelhead to the Yakima River. By conservative estimates, Yakima Basin summer steelhead, coho salmon, and spring and summer chinook salmon runs would be expected to increase by about 6,325 fish. The proposed action would play an integral part in the overall Yakima River anadromous fish enhancement program (fish passage improvement, habitat enhancement, hatchery production increases, and harvest management). Likewise, the effectiveness of other measures undertaken (past, present, and future) to advance Basin fisheries would be improved by the proposed action.

There would be environmental benefits associated with implementation of the Fish Passage and Protective Facilities Phase II Project. Based on the evaluation presented in this assessment, there would be no significant adverse environmental impacts if the proposed action was carried forward.

No significant adverse environmental effects have been identified from construction and operation of the Yakima Phase II fish passage project. Proper design and implementation of the project will ensure no adverse effects will occur. Based on the information in this environmental analysis, BPA's and Reclamation's proposal to construct these facilities does not constitute a major Federal action that could significantly affect the quality of the human environment.

CHAPTER 6

CONSULTATION AND COORDINATION

6.1 TECHNICAL WORK GROUP FOR THE YAKIMA RIVER FISH PASSAGE AND PROTECTIVE FACILITIES

This Technical Work Group (TWG) Committee has been in place since about 1983. It was established when planning began for the Phase I fish passage and protective facilities on the larger mainstem Yakima River diversion dams and irrigation canals. The purpose of the TWG was to integrate fishery management and biological expertise with engineering, design, and construction specialists. The Phase I projects are nearly completed now, but the TWG plans to continue to meet and coordinate all aspects of the Phase II fish screening program over the next few years. The TWG Committee consists of Federal (Reclamation, USFWS, National Marine Fisheries Service, BPA, Bureau of Indian Affairs); State (WDF); Tribal (Yakima Indian Nation); and irrigation district membership.

6.2 AGENCIES AND PERSONS CONTACTED

The following agencies and individuals were contacted by Reclamation in the preparation of this draft EA.

U.S. Fish and Wildlife Service--Jeff Haas
National Marine Fisheries Service--Steve Rainey
Bonneville Power Administration--Tom Clune, Kevin Ward
U.S. Army Corps of Engineers--Arlie Winther
Federal Emergency Management Agency--Joe Webber
Yakima Indian Nation--Bob Tuck, Dave Fast, Bruce Watson
Washington Department of Fisheries--John Easterbrooks
Washington Department of Wildlife--Lee Stream
Kittitas County Planning Office--Tom Pickerel
Yakima County Planning Department--Tom Durrant
Benton County Planning Department--Terry Marden
Washington Department of Ecology--Bob Barwin, Bob Swakhamer
Bureau of Land Management--Gary Yeager
Washington Department of Parks--Steve Starland
National Park Service--Dennis Carty, Brian Boden
Soil Conservation Service--Jeff Graham

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APPENDIX A

FISH PASSAGE AND PROTECTIVE FACILITIES

PHASE II

YAKIMA RIVER BASIN, WASHINGTON

SITE SPECIFIC DESCRIPTIONS

YAKIMA RIVER BASIN FISH PASSAGE IMPROVEMENTS

PHASE II

Unit Number: 1

Name: Kiona

Location: The Kiona Canal Diversion (approximately 50 cfs) is located on the left bank of the Yakima River at river mile 34.9 just downstream of the Chandler Power Plant discharge, Benton County, Washington, T. 9 N., R. 26 E., section 11 (see frontispiece map).

Owner or Contact: Kiona Irrigation District

Fish Passage Problems: The existing screen facility is located too far from the headworks (about 2.5 miles) and excessive predation occurs in the canal between the headworks and fish screen. The facility does not meet present velocity, bypass, and orientation criteria for effective screens. Quarter-inch screen mesh too large to protect fall chinook fry.

Possible Improvements: Relocate the screen closer to the headworks. Increase screen area to meet approach velocity criteria and reorient the screens to improve bypass entrance conditions. Replace existing screens with 1/8-inch mesh.

Special Considerations: Corral Creek crosses the Kiona Canal about 1/2 mile above the existing screens, and much of the summer flow of the creek is diverted into the canal during the irrigation season. The creek crossing is complex and has both adult passage and juvenile screening problems. Upstream migration is blocked at low flows but may be possible at high flows. Juveniles are presently diverted into the canal but are screened out by the existing screens.

Algae and weed problems at the existing screens may require special consideration in screen mesh design criteria or special spray bars to clean the screen may be needed.

This is a high priority site because of its location low on the Yakima River; all upstream production of salmon and steelhead must pass this diversion during the downstream migration.

Unit Number: 2

Name: Snipes/Allen

Location: The Snipes/Allen Canal Diversion (25-30 cfs) is located on the left bank of the Yakima River at river mile 97.0 near Buena, Yakima County, Washington, T. 11 N., R. 20 E., section 17 (see frontispiece map).

Owner or Contact: Buena Irrigation District

Fish Passage Problems: The existing screen is oriented perpendicular to canal flow; the approach velocity and screen mesh do not meet present criteria, and the bypass does not operate properly at high flows (there are reverse flows in the bypass at high riverflows).

Possible Improvements: Increase screen area to meet approach velocity criteria, reduce mesh size, reorient the screens to improve bypass entrance conditions, and improve bypass configuration to operate over a larger range of riverflow conditions. Rebuild the headworks to reduce loss of head.

Special Considerations: Algae and weed problems occur at the existing screens at certain times of the year, especially during low flows and at high temperatures. Special consideration may be required in screen mesh design criteria or spray bars to clean the screens may be needed.

Passage improvements at this site were included in the Phase I program but were delayed because of the possibility of serving the district from either the Sunnyside or the Roza Canals. Consolidation plans still have not materialized.

Unit Number: 3

Name: Boise-Cascade

Location: The Boise-Cascade Mill Diversion (approximately 5 cfs) is located on the right bank of the Yakima River at river mile 115.85 about 1/2 mile downstream of the Naches River confluence near Yakima, Yakima County, Washington, T. 13 N., R. 19 E., section 7 (see frontispiece map).

Owner or Contact: Boise-Cascade Corporation

Fish Passage Problems: The bypass is an overflow weir into an open channel that eventually passes through a bass pond. Excessive predation of juveniles occur as they pass through the pond.

Possible Improvements: Move the screen facilities closer to the headworks so the bypass can discharge directly into the river.

Special Considerations: An evaluation of the this site is needed early in the Phase II program to determine the best location for the new facility. A direct bypass to the river cannot be constructed at the location of the existing facilities.

Unit Number: 4

Name: Union Gap

Location: The Union Gap Canal Diversion (approximately 50 cfs) is located on the left bank of the Yakima River at river mile 114.7 about 1-1/2 miles downstream of the Naches River confluence near Yakima, Yakima County, Washington, T. 13 N., R. 19 E., section 7 (see frontispiece map).

Owner or Contact: Union Gap Irrigation District

Fish Passage Problems: The existing screens are oriented perpendicular to the canal flow, and the approach velocity exceeds present criteria.

Possible Improvements: Increase screen area to meet approach velocity criteria and reorient the screens to improve bypass entrance conditions.

Special Considerations: It may be possible to consolidate this diversion with that of the Roza Irrigation District and meet the water needs of the Union Gap Irrigation District from the Roza Canal. If this were done, the possible screen improvements noted above would not be needed.

Unit Number: 5

Name: Moxee

Location: The Moxee-Hubbard Ditch Diversion (approximately 45 cfs) is located on the left bank of the Yakima River at river mile 115.9 about 1/2 mile downstream of the Naches River confluence near Yakima, Yakima County, Washington, T. 13 N., R. 19 E., section 7 (see frontispiece map). The Moxee-Hubbard ditch divides into the Moxee Ditch (approximately 15 cfs) and the Hubbard Ditch (approximately 30 cfs), and each canal is screened separately.

Owner or Contact: Moxee Ditch Company

Fish Passage Problems: The approach velocity to the screens exceeds present criteria. Also, the existing structure is old and the concrete is deteriorating.

Possible Improvements: Increase screen area and improve submergence of the screens to meet approach velocity criteria.

Special Considerations: It may be possible to consolidate this diversion with that of the Roza Irrigation District and meet the water needs of the Moxee Ditch Company from the Roza Canal. If this were done, the possible screen improvements noted above would not be needed.

Unit Number: 6

Name: Hubbard

Location: The Moxee-Hubbard Ditch Diversion (approximately 45 cfs) is located on the left bank of the Yakima River at river mile 115.9 about 1/2 mile downstream of the Naches River confluence near Yakima, Yakima County, Washington, T. 13 N., R. 19 E., section 7 (see frontispiece map). The Moxee-Hubbard ditch divides into the Moxee Ditch (approximately 15 cfs) and the Hubbard Ditch (approximately 30 cfs), and each canal is screened separately.

Owner or Contact: Hubbard Ditch Company

Fish Passage Problems: The approach velocity to the screens exceeds present criteria.

Possible Improvements: Increase screen area and improve submergence of the screens to meet approach velocity criteria.

Special Considerations: It may be possible to consolidate this diversion with that of the Roza Irrigation District and meet the water needs of the Moxee Ditch Company from the Roza Canal. If this were done, the possible screen improvements noted above would not be needed.

Unit Number: 7

Name: Taylor

Location: The Taylor Ditch Diversion (approximately 10 cfs) is located on the right bank of the Yakima River at river mile 122.1 near Selah, Yakima County, Washington, T. 14 N., R. 19 E., section 19 (see frontispiece map).

Owner or Contact: Taylor Ditch Company

Fish Passage Problems: The approach velocity to the screens exceeds present criteria. At high riverflows, water backs up into the bypass. Also, the bypass becomes plugged quite easily because its diameter is too small and debris catches at the concrete pipe points.

Possible Improvements: Increase screen area and improve submergence of the screens to meet approach velocity criteria. Use smooth PVC pipe of sufficient size without bends or angles.

Special Considerations: Construction access to the site may be difficult.

T.13N.,R.19E.,W.M.
YAKIMA EAST WA. QUAD.

Unit Number: 8

Name: Selah-Moxee

Location: The Selah-Moxee Canal Diversion (approximately 100 cfs) is located on the left bank of the Yakima River at river mile 123.9 near Selah, Yakima County, Washington, T. 14 N., R. 19 E., section 8 (see frontispiece map).

Owner or Contact: Selah-Moxee Irrigation District

Fish Passage Problems: The approach velocity to the screens exceeds present criteria. The screens are too close to the headgate for adequate submergence and are oriented perpendicular to canal flow. At high riverflows, reverse waterflows occur in the bypass.

Possible Improvements: Increase screen area and improve submergence of the screens to meet approach velocity criteria. Reorient the screens to improve bypass entrance conditions. Improve the bypass so that it will operate properly over a large range of riverflows. May need to relocate the screen facility downstream.

Special Considerations: A railroad adjacent to the site may complicate right-of-way acquisition and construction access to the site. It may be possible to consolidate this diversion with that of the Roza Irrigation District and meet the water needs of the Moxee Ditch Company from the Roza Canal. If this were done, the possible screen improvements noted above would not be needed.

Unit Number: 9

Name: McAusland

Location: The McAusland Diversion (approximately 10 cfs) is located on the left bank of the Yakima River at river mile 149.9, about 4 miles south of Ellensburg, Kittitas County, Washington, T. 17 N., R. 18 E., section 24 (see frontispiece map).

Owner or Contact: Victor Boykiew

Fish Passage Problems: The approach velocity to the screen is high due to low submergence of the screen. The trashrack is vertical and difficult to clean.

Possible Improvements: Improve submergence of the screen to meet approach velocity criteria.

Special Considerations: The only existing traveling belt screen in the basin. This screen has no fish bypass system.

T. 14N., R. 19E., W.M.
POMONA Wa. QUAD.

Unit Number: 10

Name: Tjossem

Location: The Tjossem Ditch Diversion (approximately 25 cfs) is located on the left bank of the Yakima River at river mile 152.2 near Ellensburg, Kittitas County, Washington, T. 17 N., R. 18 E., section 11 (see frontispiece map).

Owner or Contact: John Huges

Fish Passage Problems: There is a constant problem with keeping the paddle-wheel and screen drum turning. Bypass entrance needs improvement.

Possible Improvements: Replace the shaft bearings and/or redesign the paddle-wheel configuration. Improve the bypass. Upgrade with smaller screen mesh.

Special Considerations: None

Unit Number: 11

Name: Vertrees No. 2

Location: The Vertrees No. 2 Ditch Diversion (approximately 10 cfs) is located on the right bank of the Yakima River at river mile 151.7 near Ellensburg, Kittitas County, Washington, T. 17 N., R. 18 E., section 14 (see frontispiece map).

Owner or Contact: Skip Myner

Fish Passage Problems: Bypass flows must pass through a mile long ditch to return to the river. There is good submergence of the screen but the approach velocity exceeds present criteria. There is an unscreened turnout above the screen facility. Screen is oriented perpendicular to canal flow.

Possible Improvements: Relocate screens above unscreened turnout or screen the turnout. Increase screen area to meet approach velocity criteria. Narrow and improve bypass ditch and reorient the screen to improve bypass entrance conditions.

Special Considerations: Consolidation possibilities should be investigated to determine if the diversion could be met from another canal and eliminate the need for a mile long bypass ditch.

Unit Number: 12

Name: Vertrees No. 1

Location: The Vertrees No. 1 Ditch Diversion (3-5 cfs) is located on the right bank of the Yakima River at river mile 152.4 near Ellensburg, Kittitas County, Washington, T. 17 N., R. 18 E., section 11 (see frontispiece map).

Owner or Contact: Marie Thayer Siltman

Fish Passage Problems: The screen has inadequate submergence and does not clean well. The bypass is inadequate and easily plugs with trash.

Possible Improvements: Improve screen submergence and improve the bypass.

Special Considerations: It may be possible to consolidate this diversion with that of Fogarty Ditch. If this were done, the screen improvements noted above would also be combined.

Unit Number: 13

Name: Fogarty

Location: The Fogarty Ditch Diversion (approximately 20 cfs) is located on the right bank of the Yakima River at river mile 153.0 near Ellensburg, Kittitas County, Washington, T. 17 N., R. 18 E., section 10 (see frontispiece map). The diversion splits into the Fogarty Ditch and the Dyer Ditch below the headworks.

Owner or Contact: Robert Acheson, Jr.

Fish Passage Problems: The approach velocity to the screen exceeds current criteria. The paddle-wheel drive does not operate consistently and the bypass is in poor condition. Water from the bypass flows through the Vertrees No. 1 unit.

Possible Improvements: Improve screen area and submergence to meet current approach velocity criteria. Relocate the screen facility closer to the headworks and construct a buried pipe bypass to the river. Replace paddle-wheel drive system.

Special Considerations: It may be possible to consolidate this diversion with those of Vertrees No. 1 and Vertrees No. 2. A new screening facility serving all three diversions could be constructed at the location if the facility was located close to the headworks.

Unit Number: 14

Name: Bull

Location: The Bull Ditch Diversion (approximately 20 cfs) is located on a side channel on the left bank of the Yakima River at river mile 153.3 near Ellensburg, Kittitas County, Washington, T. 17 N., R. 18 E., section 10 (see frontispiece map).

Owner or Contact: Bob Billster

Fish Passage Problems: Screen submergence is inadequate resulting in excessive approach velocity to the screen.

Possible Improvements: A check structure to improve screen submergences. Also construct a modern bypass to direct the fish back into the river and replace the screen seals. Improve the trashrack. Need to shorten abutment wall so screen is not "recessed" as much.

Special Considerations: None

Unit Number: 15

Name: Ellensburg Mill

Location: The Ellensburg Mill Diversion (approximately 25 cfs) is located on a side channel on the left bank of the Yakima River at river mile 157.2 about 10 miles northwest of Ellensburg, Kittitas County, Washington, T. 18 N., R. 18 E., section 29 (see frontispiece map).

Owner or Contact: Harold Lamb

Fish Passage Problems: Approach velocity to the screens exceeds present criteria. The screen is oriented perpendicular to the canal flow and the bypass has a reverse flow during high riverflows.

Possible Improvements: Improve screen area and screen submergence to meet approach velocity criteria. Reorient the screen to improve bypass entry conditions and reconstruct the bypass to operate properly at high riverflows.

Special Considerations: It may be possible to construct a traveling screen at the headworks with a short bypass on the upstream side of the upstream side of flood levee.

Unit Number: 16

Name: New Cascade

Location: The Cascade Canal Diversion (approximately 150 cfs) is located on the left bank of the Yakima River at river mile 160.3 about 7 miles northwest of Ellensburg, Kittitas County, Washington, T. 18 N., R. 18 E., section 18 (see frontispiece map).

Owner or Contact: Cascade Irrigation District

Fish Passage Problems: The trashrack needs rebuilding and a gantry crane is needed to lift the screens for winter storage. The entrance to the bypass is presently an orifice, and the bypass has a pump on it which is not desirable. The existing screens have a severe rust problem.

Possible Improvements: Rebuild the trashrack and add a gantry crane to lift the screens. Construct a gravity flow bypass system and eliminate fish pumps, if possible, and modify the bypass entrance to a vertical slot type. Replace the existing screen mesh.

Special Considerations: None

Unit Number: 17

Name: Packwood

Location: The Packwood Ditch Diversion (approximately 30 cfs) is located on the right bank of the Yakima River at river mile 160.6 about 7 miles northwest of Ellensburg, Kittitas County, Washington, T. 18 N., R. 17 E., section 13 (see frontispiece map).

Owner or Contact: Tom Brunson

Fish Passage Problems: The screen is oriented perpendicular to canal flow. Approach velocity meets present criteria if screen is properly checked up. The bypass is good.

Possible Improvements: No major work is required.

Special Considerations: None

Unit Number: 18

Name: Old Cascade

Location: The Old Cascade Canal Diversion (20-25 cfs) is located on the left bank of the Yakima River at river mile 168.9 about 15 miles northwest of Ellensburg, Kittitas County, Washington, T. 19 N., R. 17 E., section 28 (see frontispiece map).

Owner or Contact: Cascade Irrigation District

Fish Passage Problems: The approach velocity to the screen exceeds present criteria. The bypass is inadequate.

Possible Improvements: Increase screen area and improve screen submergence to meet approach velocity criteria. Construct a modern bypass to efficiently return fish to the river.

Special Considerations: This canal serves about 200 acres at the upper end of the Cascade system. It may be possible to serve these lands from Kittitas Reclamation District system. If this were done, the screen improvements noted above would not be needed.

Construction access to the present screen site is poor.

Unit Number: 19

Name: O'Conner

Location: The O'Conner Ditch Diversion (approximately 5 cfs) is located on the left bank of the Yakima River at river mile 178.9 about 2 miles upstream of the Teanaway River confluence, Kittitas County, Washington, T. 20 N., R. 16 E., section 31 (see frontispiece map).

Owner or Contact: David Smith

Fish Passage Problems: This facility appears to be in good condition. There is a good bypass into a side channel.

Possible Improvements: The ditch has not been used since September 1986; new bearings for the paddle-wheel drive will be needed if the ditch is reactivated.

Special Considerations: None

Unit Number: 20

Name: Younger

Location: The Younger Ditch Diversion (approximately 10 cfs) is located on the left bank of the Yakima River at river mile 181.9 near Cle Elum, Kittitas County, Washington, T. 20 N., R. 15 E., section 35 (see frontispiece map).

Owner or Contact: Bernard Henshaw

Fish Passage Problems: Approach velocity to the screens does not meet present criteria. The bypass does not always operate properly and it is difficult for fish to locate the bypass entrance.

Possible Improvements: Increase screen area to meet approach velocity criteria. Construct a modern, vertical slot bypass, and angle the screens to improve bypass entrance conditions.

Special Considerations: This is the uppermost facility on the Yakima River in the Phase II program. The diversion is located in a prime spring chinook spawning area.

Unit Number: 21

Name: Old Union

Location: The Old Union Canal Diversion (approximately 30 cfs) is located on the right bank of the Naches River at river mile 2.5 near Yakima, Yakima County, Washington, T. 13 N., R. 18 E., section 10 (see frontispiece map).

Owner or Contact: Dave Anderson

Fish Passage Problems: The screen facility and bypass at this site are in good condition, and no additional work on the facility is needed. Vandalism is a problem at the site.

Possible Improvements: Constructing a gate and fence at the beginning of the access road to the screen will minimize vandalism problems.

Special Considerations: None

T.20N., R.15E., W.M.
AND
T.20N., R.16E., W.M.
CLE ELUM WA. QUAD.

Unit Number: 22

Name: Fruitvale

Location: The Fruitvale Canal Diversion (approximately 100 cfs) is located on the right bank of the Naches River at river mile 2.7 near Yakima, Yakima County, Washington, T. 13 N., R. 18 E., section 10 (see frontispiece map). The diversion is located on a side channel of the Naches River at the Cowiche Creek confluence.

Owner or Contact: Yakima City Irrigation District

Fish Passage Problems: The approach velocity to the screen does not meet present criteria. The concrete is deteriorating. The bypass is good but occasionally plugs up.

Possible Improvements: Replace the existing structure. Increase screen area to meet approach velocity criteria and improve bypass operation.

Special Considerations: The canal is used for juvenile salmon and steelhead rearing during winter.

Unit Number: 23

Name: Toppenish Pump

Location: The Toppenish Pump Diversion (about 90 cfs) is located on the right bank of Toppenish Creek at river mile 26.5 in Yakima County, Washington, T. 10 N., R. 18 E., section 27 (see frontispiece map).

Owner or Contact: Wapato Irrigation Project

Fish Passage Problems: There presently is no screening facility at this site.

Possible Improvements: Construct a modern fish screen and bypass facility at the site.

Special Considerations: There is an existing pond on the upstream side of the feeder canal that is part of the system providing flow into the canal. Screening facilities at this site must be located and designed such that juvenile fish do not get into the canal behind the screens during spring flooding of the pond area.

Unit Number: 24

Name: Naches-Cowiche

Location: The Naches-Cowiche Canal Diversion (approximately 40 cfs) is located on the left bank of the Naches River at river mile 3.6 (across the river from the City of Yakima Diversion) near Yakima, Yakima County, Washington, T. 13 N., R. 18 E., section 9 (see frontispiece map).

Owner or Contact: Naches-Cowiche Irrigation District

Fish Passage Problems: The approach velocity to the screen does not meet present criteria. Trash frequently plugs the bypass.

Possible Improvements: Increase screen area to meet approach velocity criteria. Reorient the screens to improve bypass entrance conditions, and change the bypass configuration to eliminate plugging.

Special Considerations: This is a high priority site due to its size and location low on the Naches River; all salmon and steelhead produced upstream past this location during their downstream migration.

Unit Number: 25

Name: Chapman-Nelson

Location: The Chapman-Nelson Ditch Diversion (approximately 10 cfs) is located on the left bank of the Naches River at river mile 6.0 about 7 miles east of Naches, Yakima County, Washington, T. 14 N., R. 18 E., section 31 (see frontispiece map).

Owner or Contact: Harvey Ferguson

Fish Passage Problems: This facility is in basically good condition, and no additional work is needed.

Possible Improvements: None

Special Considerations: There is good rearing habitat for salmon and steelhead in the canal above the screen.

T.13N.,R.18E.,W.M.
 SELAH WA. QUAD.

(a)

Unit Number: 26

Name: Congdon

Location: The Congdon Canal Diversion (approximately 55 cfs) is located on the right bank of the Naches River at river mile 8.8 about 4 miles east of Naches, Yakima County, Washington, T. 14 N., R. 17 E., section 25 (see frontispiece map).

Owner or Contact: Yakima Valley Canal Company

Fish Passage Problems: The approach velocity to the screen does not meet present criteria. The drum rotates at a high speed rapidly carrying impinged fish over the screen and back into the canal. The existing bypass is too small and is continually plugged.

Possible Improvements: Increase screen area to meet approach velocity criteria. Angle the screens to improve bypass entrance conditions and improve the bypass configuration to operate efficiently.

Special Considerations: This canal is located adjacent to Eschbach Park. Also, the existing screen is quite old and may have historical significance. Although further study and analysis are needed before a final decision is made, it has been suggested that the old screen be left in place and an interpretive center be constructed in the park, near the new screen facility, that explains the major differences between a modern, state-of-the-art screen facility and the older screen facilities.

This is a high priority site due to its size and location low on the Naches River; all upstream salmon and steelhead production must pass this location during the downstream migration.

Unit Number: 27

Name: Gleed

Location: The Gleed Ditch Diversion (approximately 20-25 cfs) is located on the left bank of the Naches River at river mile 9.4 near Naches, Yakima County, Washington, T. 14 N., R. 17 E., section 24 (see frontispiece map).

Owner or Contact: Gleed Ditch Company

Fish Passage Problems: The bypass is not functional most of the time. Fish that enter the canal cannot return to the river unless they swim back up the canal and under the headgate. Following the irrigation, Washington Department of Fisheries removes juveniles from the canal by electrofishing. Several hundred salmon and several hundred trout are typically removed from the canal each year.

Possible Improvements: It would be very costly to construct a new bypass because it would have to pass through an orchard and under a railroad and highway. Therefore, building vertical traveling screens in front of the headgate may be the cost-effective solution to the problem.

Special Considerations: It may be possible to consolidate this diversion with that of the Wapatox Canal and meet the needs of the Gleed Ditch Company from the Wapatox Power Canal. If this were done, the possible screen improvements noted above would not be needed.

Unit Number: 28

Name: Powell

Location: The Powell Ditch Diversion (approximately 30 cfs) is located on the right bank of the South Channel of the Naches River at river mile 1.0 of the channel near Naches, Yakima County, Washington, T. 14 N., R. 17 E., section 9 (see frontispiece map). The South Channel is a regulated right bank side channel of the Naches River that extends from river mile 14.0 to river mile 12.2 of the Naches.

Owner or Contact: Paul Kauzlarich

Fish Passage Problems: Screen has inadequate submergence and approach velocity to the screen does not meet current criteria. There is no bypass.

Possible Improvements: Improve screen submergence and increase screen area to meet approach velocity criteria. Construct an operable bypass and angle the screen to improve bypass entrance conditions.

Special Considerations: May be consolidated into the South-Naches Irrigation District with new point of diversion at Oak Flats.

Unit Number: 29

Name: Lewis

Location: The Lewis Ditch Diversion (approximately 3 cfs) is located on the left bank of the South Channel of the Naches River at river mile 1.1 of the channel near Naches, Yakima County, Washington, T. 14 N., R. 17 E., section (see frontispiece map). The South Channel is a regulated right bank side channel of the Naches River that extends from river mile 14.0 to river mile 12.2 of the Naches.

Owner or Contact: Jack Lewis

Fish Passage Problems: The pillow block bearings on the screen need replacement. Concrete diversion dam has a 2-foot drop--possible adult passage problem. Bypass is too small and subject to plugging.

Possible Improvements: Replace paddle-wheel pillar blocks with sealed roller bearings. Construct adult passage on diversion dam. Enlarge and improve bypass.

Special Considerations: May be consolidated into the South-Naches Irrigation District with new point of diversion at Oak Flats.

Unit Number: 30

Name: La Fortune

Location: The La Fortune Ditch Diversion (approximately 30 cfs) is located on the right bank of the South Channel of the Naches River at river mile 1.2 of the channel near Naches, Yakima County, Washington, T. 14 N., R. 17 E., section 9 (see frontispiece map). The South Channel is a regulated right bank side channel of the Naches River that extends from river mile 14.0 to river mile 12.2 of the Naches.

Owner or Contact: Paul Kauzlarich

Fish Passage Problems: The approach velocity to the screen exceeds present criteria.

Possible Improvements: Increase screen area to meet approach velocity criteria. Improve headworks or provide a check structure to control flows and head on screen. Angle screens to improve bypass entrance conditions.

Special Considerations: May be consolidated into the South-Naches Irrigation District with new point of diversion at Oak Flats.

Unit Number: 31

Name: Ireland

Location: The Ireland Ditch Diversion (approximately 2 cfs) is located on the left bank of the South Channel of the Naches River at river mile 1.3 of the channel near Naches, Yakima County, Washington, T. 14 N., R. 17 E., section 9 (see frontispiece map). The South Channel is a regulated right bank side channel of the Naches River that extends from river mile 14.0 to river mile 12.2 of the Naches.

Owner or Contact: C. R. Harris

Fish Passage Problems: The paddle-wheel drive has mechanical problems, and the screen drum does not turn properly.

Possible Improvements: Install new sealed roller bearings on paddle wheel to improve drive system's performance.

Special Considerations: This diversion is only used intermittently.

Unit Number: 32

Name: Scott

Location: The Scott Ditch Diversion (approximately 40 cfs) is located on the right bank of the South Channel of the Naches River at river mile 1.4 of the channel near Naches, Yakima County, Washington, T. 14 N., R. 17 E., section 4 (see frontispiece map). The South Channel is a regulated right bank side channel of the Naches River extending from river mile 14.0 to river mile 12.2 of the Naches.

Owner or Contact: Paul Kauzlarich

Fish Passage Problems: The approach velocity to the screens exceeds present criteria. Screen submergence exceeds 80 percent; this condition is hazardous to small fish (can be easily carried over the screen into the canal). Approaching flow is turbulent because the facility is too close to the headworks. Bypass entrance is a small orifice.

Possible Improvements: Increase screen area to meet approach velocity criteria. Improve screen submergence to reduce hazard to small fish. Angle screens to improve bypass entrance conditions and convert bypass entrance to vertical slot type. Relocate facility further away from headworks.

Special Considerations: Construction access to this site may be a problem. May be consolidated into the South-Naches Irrigation District with new point of diversion at Oak Flats.

Unit Number: 33

Name: Brewer

Location: The Brewer Ditch Diversion (approximately 3 cfs) is located on the left bank of the South Channel of the Naches River at river mile 1.5 of the channel near Naches, Yakima County, Washington, T. 14 N., R. 17 E., section 4 (see frontispiece map). The South Channel is a regulated right bank side channel of the Naches River extending from river mile 14.0 to river mile 12.2 of the Naches.

Owner or Contact: Merle Brewer

Fish Passage Problems: The screen drum does not turn properly.

Possible Improvements: Revise gear and/or drive sprocket ratios on the paddle-wheel drive to increase drum RPM's.

Special Considerations: None

Unit Number: 34 & 35

Name: Kim Olson, Albert Finney

Location: The Kelly/Lowry Diversion (approximately 40-50 cfs) is located on the left bank of the Naches River (North Channel) at river mile 13.7 near Naches, Yakima County, Washington, T. 14 N., R. 17 E., section 4 (see frontispiece map). The combined Kelly/Lowry flow splits about 1/2 mile below the headgate into the Lowry Ditch (upper) and the Kelly Ditch (lower).

Owner or Contact: John McPhee

Fish Passage Problems: The approach velocity to the screens exceeds present criteria. The screens are perpendicular to the canal flow and the bypass needs to be improved.

Possible Improvements: Increase screen area to meet approach velocity criteria. Angle the screens to improve bypass entrance conditions and construct a new vertical-slot bypass.

Special Considerations: The existing bypass channel contains excellent rearing habitat for salmon and steelhead but is partially blocked at times by a culvert through a levee. The outfall of this culvert needs to be modified if the channel is to continue to be used as rearing habitat.

At present, each ditch has a separate screen. It may be possible to rebuild and consolidate the screens above the separation of the two ditches.

This is a high priority site due to its size and location low on the Naches River; all upstream salmon and steelhead production in this tributary must pass this location during the downstream migration.

Unit Number: 36

Name: Clark

Location: The Clark Ditch Diversion (approximately 10 cfs) is located on the left bank of the Naches River at river mile 14.9 near Naches, Yakima County, Washington, T. 14 N., R. 17 E., section 5 (see frontispiece map).

Owner or Contact: Jerry Harris

Fish Passage Problems: This unit does not have a check structure, making proper screen submergence difficult to maintain. Bypass effectiveness also suffers as a result.

Possible Improvements: Improve screen submergence by constructing a check structure.

Special Considerations: None

Unit Number: 37

Name: Foster-Naches

Location: The Foster-Naches Diversion (approximately 8 cfs) is located on the right bank of the Naches River at river mile 14.95 near Naches, Yakima County, Washington, T. 14 N., R. 17 E., section 5 (see frontispiece map).

Owner or Contact: Mrs. Johnnie Crawford

Fish Passage Problems: Cannot get proper submergence on the screen. Lack of head loss to drive the paddle wheel.

Possible Improvements: Improve screen submergence. Possible consolidation within South Naches Irrigation District and new diversion point at Oak Flats.

Special Considerations: Construction access to this site may be a problem.

(b)

Unit Number: 38

Name: Johncox

Location: The Johncox Diversion (about 10 cfs) is located on the left bank of the North Fork of Ahtanum Creek at river mile 3.0 in Yakima County, Washington, T. 12 N., R. 18 E., section 12 (see frontispiece map).

Owner or Contact: Unknown at present time

Fish Passage Problems: There is presently no screening facility at this site.

Possible Improvements: Construct a modern screen and bypass facility at this site.

Special Considerations: None

Unit Number: 39

Name: Naches-Selah

Location: The Naches-Selah Canal Diversion (approximately 175 cfs) is located on the left bank of the Naches River at river mile 18.4 about 1/2 mile upstream of the Tieton River confluence, Yakima County, Washington, T. 15 N., R. 16 E., section 35 (see frontispiece map).

Owner or Contact: Naches-Selah Irrigation District

Fish Passage Problems: The approach velocity to the screens exceeds present criteria. The screens are oriented perpendicular to the canal flow and the bypass needs to be improved.

Possible Improvements: Increase screen area to meet approach velocity criteria. Angle the screens in the canal to improve bypass entrance conditions and construct a new vertical-slot bypass.

Special Considerations: This is a high priority site due to its size, location low on the Naches River, and fish entrainment problems.

The diversion may be moved upstream about 1 mile near the proposed hatchery site at Oak Flat. Coordination between the two projects is essential. A single, large screen facility could be constructed to serve Naches-Selah, South Nahces, and the proposed new fish hatchery at Oak Flats.

T.12N.,R.15E.,W.M.
TIETON WA. QUAD.

(a)

Unit Number: 40

Name: Carmack

Location: The Cormack Ditch Diversion (approximately 20 cfs) is located on the right bank of the Naches River at river mile 27.4 about 1/2 mile below the Rattlesnake Creek confluence near Nile, Yakima County, Washington, T. 15 N., R. 15 E., section 2 (see frontispiece map).

Owner or Contact: Flying H Youth Ranch

Fish Passage Problems: Bypass flows sometimes deficient due to improper operation and maintenance.

Possible Improvements: Use smaller boards on overflow bypass weir.

Special Considerations: Damage to the screen facility has occurred frequently in the past from falling rocks. The owner has recently installed a protective cover to shield the screen from falling rocks.

Unit Number: 41

Name: Holwegner

Location: The Holwegner Diversion (3-5 cfs) is located on the right bank of Satus Creek near river mile 28.0 in Yakima County, Washington, T. 9 N., R. 20 E., section 13 (see frontispiece map).

Owner or Contact: Unknown at present time.

Fish Passage Problems: There is presently no screen structure at this site.

Possible Improvements: Construct a modern fish screen and bypass facility on the canal or purchase the diversion right.

Special Considerations: Access for construction will be difficult.

Unit Number: 42

Name: Lindsey

Location: The Lindsey Ditch Diversion (approximately 20 cfs) is located on the right bank of the Naches River at river mile 31.0 about 2 miles upstream of the Rattlesnake Creek confluence, Yakima County, Washington, T. 16 N., R. 15 E., section 21 (see frontispiece map).

Owner or Contact: Nile Ditch Association (Richard Matson)

Fish Passage Problems: The approach velocity to the screen and screen mesh size exceed present criteria. The screen is oriented perpendicular to the canal flow.

Possible Improvements: Increase screen area to meet approach velocity criteria. Angle the screens to improve bypass entrance conditions and replace screen mesh with 1/8-inch mesh.

Special Considerations: None

Unit Number: 43

Name: Emerick

Location: The Emerick Ditch Diversion (approximately 3-5 cfs) is located on the left bank of the Naches River at river mile 36.5 near Pinecliff, Yakima County, Washington, T. 16 N., R. 14 E., section 1 (see frontispiece map).

Owner or Contact: Bill Zilliox

Fish Passage Problems: The approach velocity to the screen and screen mesh size exceed present criteria. The bypass is too small and frequently plugs up.

Possible Improvements: Increase screen area to meet approach velocity criteria. Replace screen mesh with 1/8-inch mesh and improve the bypass system.

Special Considerations: There is very poor access to the site, which may be on U.S. Forest Service land.

This diversion is located near a prime spawning area, and the screen should be designed to protect emerging fry.

T.16N., R.15E., W.M.
NILE WA. QUAD.

(b)

Unit Number: 44

Name: Anderson

Location: The Anderson Ditch Diversion (approximately 5-7 cfs) is located on the left bank of the Naches River at river mile 38.6 near Cliffdell, Kittitas County, Washington, T. 17 N., R. 14 E., section 35 (see frontispiece map).

Owner or Contact: Anderson Ditch Company

Fish Passage Problems: The approach velocity to the screen exceeds present criteria. The screen mesh size is too large, and the screen is not properly submerged. The bypass does not work effectively.

Possible Improvements: Increase screen area to meet approach velocity criteria and replace existing screen mesh with 1/8-inch mesh. Reconstruct the bypass and possibly relocate the bypass to a nearby pond. Replace pillow blocks with roller bearings. A new concrete headworks with a steel gate is needed to better control inflow to ditch.

Special Considerations: This diversion is only used intermittently during the irrigation season. The headworks is in poor condition and may need to be improved.

Unit Number: 45

Name: Tennant

Location: The Tennant Ditch Diversion (approximately 5 cfs) is located on the right bank of the Tieton River at river mile 0.2 near the Naches River confluence, Yakima County, Washington, T. 15 N., R. 16 E., section 35 (see frontispiece map).

Owner or Contact: Richard Cooper

Fish Passage Problems: The structure is old and seriously deteriorated. The screen mesh size is too large. The bypass is inadequate and actually acts mainly as a spillway to control ditch flows.

Possible Improvements: Construct a new screen facility with 1/8-inch mesh and a functional bypass.

Special Considerations: This diversion feeds the Naches Ranch recreational ponds and property. It may be possible to eliminate the screening facility and use the recreational ponds for rearing resident and anadromous fish.

T.17N.,R.14E.,W.M.
AND
T.16N.,R.14E.,W.M.
CLIFFDELL WA. QUAD.

Unit Number: 46

Name: Sinclair-Cobb

Location: The Sinclair-Cobb Ditch Diversion (approximately 2 cfs) is located on the left bank of the Tieton River at river mile 2.3 in the Yakima County, Washington, T. 14 N., R. 16 E., section 10 (see frontispiece map).

Owner or Contact: Washington Department of Wildlife

Fish Passage Problems: The approach velocity to the screen may exceed present criteria during high diversion periods. The screen mesh size is too large and the bypass is inadequate.

Possible Improvements: Construct headgate to control diversion, increase screen area, replace screen mesh with 1/8-inch mesh, and construct an effective bypass.

Special Considerations: It may be possible to consolidate this diversion with the Gnavaugh Diversion (Site No. 47). If this were done, it may also be possible to combine the screen improvements.

This is the main diversion for the Oak Creek Wildlife Refuge.

Construction access to the site may be a problem.

Unit Number: 47

Name: Gnavaugh

Location: The Gnavaugh Diversion (approximately 1 cfs) is located on the left bank of the Tieton River at river mile 3.0 in Yakima County, Washington, T. 14 N., R. 16 E., section 9 (see frontispiece map).

Owner or Contact: Washington Department of Wildlife

Fish Passage Problems: The screen facility is in good condition, but there is no functional bypass except for an overflow control.

Possible Improvements: Construct a functional bypass.

Special Considerations: This diversion provides water to the Oak Creek Wildlife Refuge. It may be possible to consolidate this diversion with the Sinclair-Cobb Diversion. If this were done, the needed screen improvements could also be consolidated.

Construction access to the existing site may be a problem.

Unit Number: 48

Name: Beck

Location: The Beck Ditch Diversion (approximately 5 cfs or less) is located on the right bank of Rattlesnake Creek at river mile 0.3 near the Naches River confluence in Yakima County, Washington, T. 15 N., R. 15 E., section 3 (see frontispiece map).

Owner or Contact: Boyd A. Brown

Fish Passage Problems: The approach velocity to the screen exceeds present criteria. The screen mesh size is too large.

Possible Improvements: Possibility of relocating screen farther downstream from headgate. Replace screen mesh with 1/8-inch mesh. Also, construct check slots upstream and downstream of paddles.

Special Considerations: None

Unit Number: 49

Name: McDaniels

Location: The McDaniels Ditch Diversion (approximately 5 cfs) is located on the left bank of Rattlesnake Creek at river mile 1.0 near the confluence of Little Rattlesnake Creek in Yakima County, Washington, T. 15 N., R. 15 E., section 3 (see frontispiece map).

Owner or Contact: Keith Morris

Fish Passage Problems: The screen mesh size is too large. Replace paddle-wheel drive and angle screens.

Possible Improvements: Replace screen mesh with 1/8-inch mesh.

Special Considerations: There is good rearing habitat for salmon and steelhead in the ditch upstream of the screen facility.

This screen facility is the uppermost screen on Rattlesnake Creek. There is no power available at this site. Improvements could possibly be funded under the Federal Mitchell Act program.

Unit Number: 50

Name: Bugni

Location: The Bugni Ditch Diversion (approximately 5 cfs or less) is located on the left bank of the Teanaway River at river mile 1.0 in Kittitas County, Washington, T. 20 N., R. 16 E., section 34 (see frontispiece map).

Owner or Contact: Ted Bugni

Fish Passage Problems: The existing screen is a flat plate screen with 1/4-inch mesh. The screen is in poor condition and lacks a trashrack.

Possible Improvements: Replace existing screen with a self-cleaning drum screen with 1/8-inch mesh. Include a trashrack and bypass in the new facility.

Special Considerations: This diversion may no longer be active or may be used only intermittently.

Unit Number: 51

Name: Seaton

Location: The Seaton Ditch Diversion (approximately 8 cfs) is located on the right bank of the Teanaway River at river mile 3.4 in Kittitas County, Washington, T. 20 N., R. 16 E., section 25 (see frontispiece map).

Owner or Contact: George Blackburn

Fish Passage Problems: The screen mesh size is too large and the screen is oriented perpendicular to canal flow. The screen seals and drive mechanism need to be replaced. The bypass does not operate properly.

Possible Improvements: Replace screen mesh with 1/8-inch mesh. Angle the screen to improve bypass entrance conditions, and replace the screen seals and drive mechanism. Construct an efficient bypass.

Special Considerations: The bypass channel to the river is about 100 yards long and could provide good habitat for salmon and steelhead rearing.

Unit Number: 52

Name: Cooper-Masterson

Location: The Cooper-Masterson Ditch Diversion (approximately 10 cfs) is located on the right bank of the Teanaway River at river mile 4.2 in Kittitas County, Washington, T. 20 N., R. 16 E., section 25 (see frontispiece map). Shortly downstream of the headworks the ditch bifurcates into the Cooper Ditch and Masterson Ditch.

Owner or Contact: Harry Masterson

Fish Passage Problems: The approach velocity to the screen and screen mesh size exceed present criteria. The screen is oriented perpendicular to the canal flow, and the structure has wood paddles. The bypass does not operate.

Possible Improvements: Increase screen area to meet approach velocity criteria and replace screen mesh with 1/8-inch mesh. Construct a bypass and angle the screen to optimize bypass entrance conditions. Replace the screen drive mechanism.

Special Considerations: None

Unit Number: 53

Name: Peterson

Location: The Peterson Ditch Diversion (approximately 5-10 cfs) is located on the left bank of the Teanaway River at river mile 6.3 in Kittitas County, Washington, T. 13 N., R. 16 E., section 13 (see frontispiece map).

Owner or Contact: Keith Shober

Fish Passage Problems: The screen mesh size is too large.

Possible Improvements: Check approach velocity at maximum flow as well as proper submergence of drum. Possibly replace screen drive bearings and replace screen mesh with 1/8-inch mesh.

Special Considerations: The side channel upstream of the screen facility contains good habitat for salmon and steelhead rearing (200+ yards).

T.20N., R.16E., W.M.
TEANAWWAY WA. QUAD.
(a)

Unit Number: 54

Name: Musetti

Location: The 3 M (Musetti) Ditch Diversion (approximately 30 cfs) is located on the left bank of the Teanaway River at river mile 7.2 in Kittitas County, Washington, T. 20 N., R. 16 E., section 14 (see frontispiece map).

Owner or Contact: Milton Downs and Violet Carollo

Fish Passage Problems: The approach velocity to the screen and screen mesh size exceed present criteria. The screen does not clean properly due to improper submergence. The bypass does not operate properly.

Possible Improvements: Increase screen area to meet approach velocity criteria. Improve submergence of the screen, and raise the structure to improve bypass operation.

Special Considerations: Ownership needs to be verified.

The canal upstream of the screen facility contains good habitat for salmon and steelhead rearing (300 yards).

Unit Number: 55

Name: Ballard

Location: The Ballard Ditch Diversion (approximately 3 cfs) is located on the left bank of the Teanaway River at river mile 10.0 in Kittitas County, Washington, T. 20 N., R. 16 E., section 9 (see frontispiece map).

Owner or Contact: John Crosetto and John E. Conner

Fish Passage Problems: The screen mesh size exceeds present criteria, the screen is badly rusted, and there is poor screen submergence. The bypass has a tendency to become plugged.

Possible Improvements: Improve submergence of the screen and replace the screen mesh with 1/8-inch mesh. Improve the bypass to eliminate plugging.

Special Considerations: Ownership needs to be verified.

The canal upstream of the screen facility contains good habitat for salmon and steelhead rearing (0.4 mile).

Unit Number: 56

Name: Contratto

Location: The Contralto Ditch Diversion (approximately 2 cfs) is located on the left bank of the North Fork of the Teanaway River at river mile 0.3 in Kittitas County, Washington, T. 20 N., R. 16 E., section 6 (see frontispiece map).

Owner or Contact: Jesse Shober

Fish Passage Problems: The screen mesh size exceeds present criteria. The approach velocity to the screen appears too high due to poor screen submergence. The bypass does not operate properly.

Possible Improvements: Replace screen mesh with 1/8-inch mesh. Improve screen submergence, and provide proper screen seals. Improve bypass configuration to provide for efficient operation.

Special Considerations: No headgate to maintain proper submergence.

Unit Number: 57

Name: Giustetti-Contratto

Location: The Giustetti-Contralto Ditch Diversion (approximately 2 cfs) is located on the right bank of the North Fork of the Teanaway River at river mile 1.2 in Kittitas County, Washington, T. 21 N., R. 16 E., section 31 (see frontispiece map).

Owner or Contact: Joe Cromarty

Fish Passage Problems: The approach velocity to the screen mesh size exceeds present criteria, and the screen side seals are in poor condition. The bypass is in poor condition and is virtually inoperative.

Possible Improvements: Replace screen mesh with 1/8-inch mesh and replace the screen side seals. Increase screen submergence and orient for good sweeping velocity. Reconstruct the bypass to operate effectively.

Special Considerations: The canal upstream of the screen facility contains good habitat for salmon and steelhead rearing 300+ yards).

Unit Number: 58

Name: Giustetti-Bussoli

Location: The Giustetti-Bussoli Ditch Diversion (approximately 1 cfs) is located on the right bank of the North Fork of the Teanaway River at river mile 1.6 in Kittitas County, Washington, T. 21 N., R. 16 E., section 31 (see frontispiece map).

Owner or Contact: Joe Cromarty

Fish Passage Problems: The screen mesh size exceeds present criteria and there are no screen side seals. The screen drive mechanism is in poor condition.

Possible Improvements: Replace screen mesh with 1/8-inch mesh, provide proper screen seals, and replace the screen drive mechanism.

Special Considerations: The canal upstream of the screen facility contains good habitat for salmon and steelhead rearing (450 yards). The ditch appears to have been abandoned since the river pipeline crossing below the screen was dismantled in 1989.

Unit Number: 59

Name: Bussoli

Location: The Bussoli Ditch Diversion (approximately 4-6 cfs) is located on the right bank of the North Fork of the Teanaway River at river mile 2.3 in Kittitas County, Washington, T. 21 N., R. 16 E., section 29 (see frontispiece map).

Owner or Contact: Boise Cascade Corporation

Fish Passage Problems: The screen and drive mechanism are in poor condition. The facility is presently inoperable, and a complete overhaul is needed. The bypass is frequently plugged.

Possible Improvements: Replace existing structure with a new screen and bypass facility.

Special Considerations: There is good habitat for fish rearing in the canal upstream of the screen facility.

Unit Number: 60

Name: Brockbank

Location: The Brockbank Ditch diversion (approximately 2 cfs) is located on the right bank of the North Fork of the Teanaway River at river mile 3.5 in Kittitas County, Washington, T. 20 N., R. 16 E., section 20 (see frontispiece map).

Owner or Contact: Boise Cascade Corporation

Fish Passage Problems: The screen mesh size is too large and the screen seals are old and deteriorated.

Possible Improvements: Replace screen mesh with 1/8-inch mesh. Replace the screen seals.

Special Considerations: This is near Dickey Creek Campground, and in 1970 a small child fell into the facility, was trapped by the paddle wheel, and drowned. As a result of this accident, all screen facilities constructed by the State are now fenced.

This diversion does not have a berm headgate or a good diversion structure, so the headwater is difficult to regulate.

Unit Number: 61

Name: Contratto-Banchi

Location: The Contratto-Banchi Ditch Diversion (approximately 4 cfs) is located on the left bank of the Middle Fork of the Teanaway River at river mile 1.9 in Kittitas County, Washington, T. 21 N., R. 15 E., section 26 (see frontispiece map).

Owner or Contact: Ted Fudacz

Fish Passage Problems: The approach velocity to the screen and screen mesh size exceed present criteria. Ditch may not have a good headworks structure to control water surface elevation at the screen. The existing screen and structure is in poor condition. The facility lacks a bypass.

Possible Improvements: Increase screen area to meet approach velocity criteria. Replace screen mesh with 1/8-inch mesh, and replace existing structure. Construct an adequate bypass.

Special Considerations: The canal upstream of the screen facility contains good habitat for salmon and steelhead rearing (240 yards).

Unit Number: 62

Name: Favro

Location: The Favro Ditch Diversion (approximately 3-5 cfs) is located on the left bank of the Middle Fork of the Teanaway River at river mile 3.5 in Kittitas County, Washington, T. 21 N., R. 15 E., section 21 (see frontispiece map).

Owner or Contact: Ted Fudacz

Fish Passage Problems: The screen mesh size and approach velocity to the screen exceed present criteria.

Possible Improvements: Needs a headworks structure. Increase screen area to meet approach velocity criteria, and replace the screen mesh with 1/8-inch mesh. Improve the bypass to operate more effectively.

Special Considerations: There have been no recorded diversion at this location since 1984. If the diversion is reactivated, then the improvements noted above will be needed. However, riverflows may enter the canal during high water, and the canal needs to be blocked if it is not used. Ownership needs to be verified.

Unit Number: 63

Name: Yakima-Tieton

Location: The Yakima-Tieton Canal Diversion (approximately 250 cfs) is located on the right bank of the Tieton River at river mile 14.4 about 7 miles downstream of Tieton Dam in Yakima County, Washington, T. 14 N., R. 15 E., section 30 (see frontispiece map).

Owner or Contact: Yakima-Tieton Irrigation District

Fish Passage Problems: The approach velocity to the screens exceeds present criteria. The bypass does not operate effectively, and the trashrack needs to be improved. Migrating gravels tend to build up on the face of the screens because of the high approach velocity.

Possible Improvements: Increase screen area to meet approach velocity criteria. Improve the bypass configuration so that it will operate effectively over a wide range of riverflows.

Special Considerations: Many persons float the river near and over the diversion dam and get caught in the backwash or hydraulic jump of the dam.

Construction access may be a problem at this site.

T.14N.,R.15E.,W.M.
TIETON BASIN WA. QUAD.

Unit Number: 64

Name: Shattuck Complex

Location: The two Shattuck Diversions are located on Satus Creek at river mile 10 and 12, upstream of the Mule Dry Creek confluence in Yakima County, Washington, T. 9 N., R. 20 E., section 15 (see frontispiece map). Two diversions occur at the site, one on each side of the stream.

Owner or Contact: Jack Shattuck

Fish Passage Problems: Neither diversion at this site presently has a screening facility.

Possible Improvements: Construct a modern fish screen and bypass facility on each diversion.

Special Considerations: This is a high priority site because of its location low on Satus Creek, present lack of a screening facilities, and the high value of the Satus system for wild steelhead production (most of the current production of wild steelhead in the Yakima basin occurs in the Satus system).

The Northside Diversion (about 10-20 cfs) takes nearly all of the water in Satus Creek during late summer; however, a large portion of the flow is returned to the Creek, but far below the diversion point. Design concepts for the screen facility should include the possibility of improving the diversion structure to reduce this unnecessary diversion and wasting of the Satus Creek flow.

The Southside Diversion provides water to lands on the south side of the Creek and also serves a wetland used for waterfowl hunting in the fall. Installation of a screen above the bifurcation would protect juvenile anadromous fish from becoming stranded in the pond.

Unit Number: 65

Name: WIP (Lower Site)

Location: The WIP Lower Canal Diversion (approximately 12 cfs) is located on the right bank of Ahtanum Creek at river mile 9.8 near Ahtanum village, Yakima County, Washington, T. 12 N., R. 18 E., section 7 (see frontispiece map).

Owner or Contact: Wapato Irrigation Project

Fish Passage Problems: There is presently no fish protective facilities at this site.

Possible Improvements: Construct a modern fish screen and bypass facility on the canal and a fish ladder on the diversion dam.

Special Considerations: None

T.9N.,R.20E.,W.M.
HEMBRE MTN. WA. QUAD.

Unit Number: 66

Name: WIP (Upper Site)

Location: The WIP Upper Canal Diversion (approximately 40 cfs) is located on the right bank of Ahtanum Creek at river mile 19.6 near Tampico, Yakima County, Washington, T. 12 N., R. 16 E., section 14 (see frontispiece map).

Owner or Contact: Wapato Irrigation Project

Fish Passage Problems: There is presently no screening facility at this site.

Possible Improvements: Construct a modern fish screen and bypass facility on the canal. Adult fish passage improvements may also be needed.

Special Considerations: None

T.12N.,R.16E.,W.M.
TAMPICO WA. QUAD.

APPENDIX B

ENDANGERED SPECIES

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Fish and Wildlife Enhancement
2625 Parkmont Lane SW, Bldg B
Olympia, Washington 98502
206/753-9440 FTS 434-9440

February 11, 1991

BUREAU OF RECLAMATION OFFICIAL FILE COPY		
1 1 1991		
TO	INITIALS	DATE
150	09	2/24
151	RA	3/1

Memorandum

To: Regional Environmental Officer, Bureau of Reclamation
Boise, ID

From: Field Supervisor, Fish and Wildlife Service
Olympia Fish and Wildlife Enhancement Field Station, Olympia, WA

Subject: Biological Assessment for Fish Passage and Protective Facilities -
Phase II Program, Yakima River Basin, Washington (1-3-91-1-136;
x-ref 1-3-91-SP-36)

This is in response to your memorandum, dated January 16, 1991, and received in this office on January 18, transmitting the biological assessment for Phase II of the Yakima River Basin Fish Passage and Protective Facilities Project in Yakima and Kittitas counties, Washington.

The Fish and Wildlife Service (Service) has reviewed the biological assessment and is in concurrence with your findings that implementation of the proposed actions described are not likely to adversely affect the spotted owl or bald eagle, providing the following conservation measures, described in the biological assessment, are fully implemented.

Conservation Recommendations for the Phase II Yakima Fish Passage Project

The Bureau of Reclamation (Bureau) will contact the U.S. Forest Service for new information on spotted owl locations a year before beginning construction on each new group of projects. If new information indicates that spotted owls may occur in the vicinity of any proposed project, the Bureau will consult with the Service on measures to minimize impacts to the species.

The Bureau will perform wintering bald eagle surveys, in accordance with the survey protocol described in the biological assessment, a year prior to construction of each group of projects scheduled for the winter construction period. If the surveys reveal bald eagles wintering in the vicinity of the proposed projects, the Bureau will consult with the Service on measures to minimize project-related impacts to the species.

The Bureau of Reclamation has complied with the requirements of Sections 7(a)(2) and 7(c) of the Endangered Species Act of 1973, as amended, thereby concluding this phase of the consultation process. As noted above, the Bureau will reinstitute consultation with the Service if new information indicates that listed species may be affected by the proposed actions.

Your interest in endangered species is appreciated. Should you have any questions regarding your responsibilities under the Act, please contact Mike Tehan of our Moses Lake Office staff, U.S. Fish and Wildlife Service, P.O. Box 1157, Moses Lake, Washington 98837 (phone 509/765-6125).

A handwritten signature in black ink, appearing to read "D.C. Frederick", with a stylized, flowing script.

David C. Frederick

mpt/gb

c: WDW (Nongame)
WNHP
WDW (Lee Stream, Yakima)
USFS (Jo Richards, Cle Elum District;
Mark Hinschberger, Naches District)

IN REPLY
REFER TO:

PN 151

United States Department of the Interior

BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-650 WEST FORT STREET
BOISE, IDAHO 83724-0043

JAN 16 1991

Memorandum

To: Field Supervisor, Fish and Wildlife Service, Olympia Field Office,
2625 Parkmont Lane SW., Building B, Olympia WA 98502

From: Regional Environmental Officer, Bureau of Reclamation, Boise ID

Subject: Biological Assessment for Fish Passage and Protective Facilities -
Phase II Program, Yakima River Basin, Washington, Endangered Species
Act Compliance (Biological Assessment/Endangered Species Act)

Enclosed for your information and use is a biological assessment for Phase II of the Fish Passage and Protective Facilities Program in the Yakima River Basin. We have enclosed the Draft Environmental Assessment document to the biological assessment as a reference for the Phase II program, description of the environment in the program area, and specific information on each of the 66 project sites.

We have concluded there would be no adverse effects on northern spotted owls or wintering bald eagles. Because of the 5-year construction program, Reclamation will conduct a survey each year of wintering bald eagles near the project sites which are scheduled for construction that winter. In addition, Reclamation will contact the Naches and Cle Elum Ranger Districts each year for new information on spotted owl nest sites.

Phase I of the Fish Passage and Protective Facilities Program is essentially completed and has resulted in increased populations of anadromous fish in the Yakima River basin. Implementation of Phase II will further enhance environmental conditions for anadromous fish and will result in increased numbers of anadromous fish in the Yakima River and tributaries. Increased prey availability should provide long-term benefits for bald eagles wintering in the Yakima River basin.

Our process for complying with the National Environmental Policy Act is continuing. Reclamation and the Bonneville Power Administration have written a draft environmental assessment, and it has been reviewed by the public and other agencies and organizations. We are close to the point where we are ready to write the Finding of No Significant Impact document for this program. We understand that you have 90 days in which to respond to our biological assessment; however, time is critical for finishing the NEPA process and keeping this very important program on schedule. We would, therefore, appreciate a response to our biological assessment as quickly as possible.

BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
JANUARY 1991

BIOLOGICAL ASSESSMENT OF POTENTIAL IMPACTS
TO NORTHERN SPOTTED OWLS AND BALD EAGLES RESULTING FROM
FISH PASSAGE AND PROTECTIVE FACILITIES - PHASE II PROGRAM
YAKIMA RIVER BASIN, WASHINGTON

INTRODUCTION

The Northwest Power Planning Council (Council) adopted the Columbia River Basin Fish and Wildlife Program in November 1982. The Fish and Wildlife Program made it possible for the implementation of Phase I of the Fish Passage and Protective Facilities Program in the Yakima River Basin. The purpose of the Phase I program was to improve anadromous fish passage at 16 large irrigation and hydroelectric diversions on the main stem Yakima River and several tributaries. Total cost for the Phase I program is about \$60 million. Phase I program construction is essentially complete, and Phase II construction will begin in mid-1991. Oversight of construction activities is the responsibility of the Bureau of Reclamation's Umatilla/Yakima Construction Office.

The purpose of the Phase II program is to construct, upgrade, or retrofit juvenile fish protective facilities at up to 66 irrigation diversions along the main stem and several tributaries of the Yakima River. Most of the diversions are operated by private irrigation districts. The amount of water diverted at the 66 diversions ranges from 1 to 175 cubic feet per second. All but four of the 66 diversions have existing screens and juvenile fish bypass facilities. Most of the screens, fish bypass systems, and water control structures are outdated, in disrepair, or not operating correctly and do not meet today's biological criteria for fish passage protection. For a more complete description and background of the Phase II program, see the attached draft environmental assessment (EA). A location map showing each of the 66 diversion sites follows page 6 in the EA. Additional information on each screen/bypass site (hereafter referred to as project site), including site maps, can be found in Appendix A of the EA.

The Bureau of Reclamation (Reclamation) was aware that the bald eagle, listed as threatened in Washington, wintered in the Yakima River basin. On December 14, 1989, Reclamation initiated informal consultation with the U.S. Fish and Wildlife Service (FWS) by requesting a list of threatened and endangered species. On January 12, 1990, FWS sent a list to Reclamation which included the bald eagle (Haliaeetus leucocephalus), and three candidate plant species. Since receiving the list from FWS, the northern spotted owl (Strix occidentalis) has also been listed as threatened in Washington. This biological assessment is written in accordance with Section 7 of the Endangered Species Act.

I. DESCRIPTION OF THE PROPOSAL

For a complete description of the Phase II program, see the attached environmental assessment.

II. DESCRIPTION OF THE ENVIRONMENT

For a complete description of the environment in the proposed program area, see the attached environmental assessment.

III. ENVIRONMENTAL IMPACTS

In order to facilitate assessment of impacts to the listed species, several steps were taken by Reclamation. On October 25, 1990, Reclamation held a meeting at the Yakima Project Office in Yakima, Washington, to inform participants of the Phase II program, and to seek information on the wintering bald eagles and northern spotted owls. Representatives from the Washington Department of Wildlife, the Naches Ranger District of the U.S. Forest Service, FWS, and Reclamation attended the meeting. The Cle Elum District of the U.S. Forest Service was invited to the meeting but could not attend. Some information on wintering bald eagles and northern spotted owls was obtained during the meeting. The Cle Elum District of the U.S. Forest Service provided information by mail following the meeting.

A copy of FWS's "Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Northern Spotted Owl" was obtained from the FWS, Olympia, Washington Field Office. Also, a copy of "A Conservation Strategy for the Northern Spotted Owl," a report of the Interagency Scientific Committee (ISC) to address the conservation of the northern spotted owl, was obtained. The ISC report was accompanied by maps which show the Habitat Conservation Areas (HCA) for the owls.

Spotted Owl: On the Cle Elum Ranger District, there is a nest site about 1.8 miles from project site 62. The nest area has not actually been pinpointed, but fledglings were observed with adults in this area in 1989 and 1990 (Richards, Personal Communications). This is the closest known nest to any project site on the Cle Elum Ranger District. Most of the project sites are located off of National Forest lands. On the Naches Ranger District, there is a spotted owl nest about 1/2 mile from project site 44. The Naches Ranger District believes there should be no impact as a result of the work proposed by Reclamation. The diversion, screen, and bypass facilities at this site are located in an area with residential housing and much human activity. Helicopter logging was conducted over the nest site last year with no apparent disturbance to the owls (Hinschberger, Personal Communications).

There are no other known spotted owl nest sites near (within miles) of any other project site in the Phase II program area. None of the project sites are within any of the designated HCA's as defined by the ISC report and accompanying map for the State of Washington.

The schedule for the Phase II program is illustrated in the attached EA following page 7. As can be seen, construction begins in the spring of 1991 on Group 1 sites (highest priority). These projects are numbers 1, 16, 24, 26, 27, 34, 35, and 64 (two screen facilities). The entire 5-year Phase II program is scheduled for completion in the spring of 1996. Reclamation believes there will be no adverse effects to nesting spotted owls as a result of implementing the Phase II program. No nesting or foraging areas will be disturbed, nor will there be an adverse impact on any of the populations of prey species which the spotted owl relies on for food. All but four of the project sites are existing screen/bypass sites which will require modifications at or very near the present facility. All of the areas in which the projects are located are areas where there is human activity on a regular basis.

Because the Phase II program will take 5 years to complete, the Yakima Project Office will contact the Naches and Cle Elum Ranger Districts, before the beginning of construction of each new group of projects, for updated information on new spotted owl nest locations. Should information of new nest sites be obtained, Reclamation will consult with FWS for measures to modify the schedule or program to minimize the possibility of adverse effects to the nesting spotted owls.

Bald Eagle: There are no known bald eagle nest sites that would be affected by the proposed program. The only known bald eagle nest within the entire Yakima River basin is near Rimrock Lake. The project site closest to this nest is number 63. It is approximately 13 miles from the nest site. Bald eagles are known to winter in the Yakima River basin. No winter census data is available for this area. Observations by Forest Service biologists indicate that bald eagles winter from the town of Easton on the upper Yakima River and the lower Teanaway River, in the area between Cle Elum and Ellensburg, and in the Harrah State Game Reserve area east of the town of Toppenish on Toppenish Creek (Richards and Hinschberger, Personal Communications). Observations by Reclamation personnel within the past several years during construction of Phase I of this program, indicate that bald eagles also winter along the main stem of the Yakima River near the Roza Diversion Dam. There are no known roost sites near any of the project sites.

There will be an increase in noise at the project sites as a result of construction activities. On page 40 of the attached EA there is a discussion of the environmental consequences of noise resulting from construction activities. Noise will result from operating machinery, trucks, excavating equipment, and other construction equipment. The noise is expected to be heard for only short distances from the project sites. It is to be expected that wildlife in the immediate area of the project sites would move from the construction areas. As noted in the EA however, project sites would generally be isolated, at different locations spread over a large geographical area, during different time periods, and often noise would be muffled by vegetation and topography.

Referring to the construction schedule again, Reclamation will conduct a wintering bald eagle survey, starting this winter, to ascertain the locations

of any wintering bald eagles in the Group I project areas. Within the Group I project sites, only five are scheduled for wintertime construction. Should the results of the survey indicate that wintering bald eagles in the vicinity of any project site could be affected by construction activities, Reclamation will reconsult with FWS and provide a plan for minimizing adverse effects. A new survey will be conducted by Reclamation each winter, a year prior to construction of the next group of projects, to ensure that no adverse effects to wintering bald eagles occur in the areas of those projects done during the wintering period for the bald eagles. The survey will extend for about 1 mile above and 1 mile below each of the project sites. The survey will be conducted two times per week during the months of November, December, and January. All sitings of bald eagles, including adult or juvenile, distance from project site, numbers, activity, and perch locations will be recorded.

IV. CONCLUSIONS

No spotted owl nests, nesting pairs of spotted owls, foraging areas, or prey will be affected by implementation of the Phase II program. Construction activities will be in a small area at each project site. All the project sites presently have diversion works, access roads, and are operated and maintained on a regular basis during the irrigation season.

Reclamation's Yakima Project Office will contact the Naches and Cle Elum Ranger Districts for updated information of nesting spotted owls about a year before the beginning of construction of each new group of projects. Should information of any new nests be obtained, Reclamation will consult with FWS on measures to minimize the possibility of adversely affecting the nesting spotted owls.

Reclamation will begin a survey to ascertain locations of wintering bald eagles a year prior to construction of the projects scheduled for the winter period. The surveys will be conducted by our Yakima Project Office. If results of the survey reveal bald eagles wintering in the vicinity of the proposed projects, FWS will be consulted on measures to minimize the possibility of adversely affecting the eagles. Implementation of the Phase I program has increased populations of anadromous fish in the Yakima River Basin. Implementation of Phase II will further increase numbers of anadromous fish in the Yakima River and tributaries. This will provide an increase in the available prey for the eagles wintering in the area and will provide long-term benefits to bald eagle populations.

With the provisions Reclamation has described in this assessment to survey wintering bald eagle populations, to obtain updated spotted owl nesting information, and to consult with the FWS should the results of new information warrant, Reclamation concludes there will be no adverse effect on the spotted owl or the bald eagle as a result of the proposed program.

Candidate Species and Species of Concern

Three candidate plant species were included with the list sent by FWS dated January 12, 1990. Reclamation will obtain plant identification and habitat requirement information from the Soil Conservation Service or other source and survey those projects where communities of these plants could occur. Appropriate measures will be taken to protect these plants should they be found in the project areas.

The Washington Department of Wildlife provided Reclamation with a list of State species of concern. Of the eight plants and animals listed as occurring in the program area, Reclamation has determined that only the osprey, could be adversely effected by construction activities at several of the project sites. Osprey nests are located in the vicinity of project site numbers 2, 10, and 15. The closest nest is located about 100 yards from project site number 10. None of these projects are in Group 1, and it is not known at this time if any of these projects will be scheduled for construction during the osprey nesting season. If these projects are constructed during the nesting season and the ospreys are still using these nest sites, all measures will be explored and safeguards taken to minimize any adverse effects to the nesting ospreys.

LITERATURE CITED

A Conservation Strategy for the Northern Spotted Owl. 1990. Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl. Portland, Oregon. 427 pages.

Bureau of Reclamation and Bonneville Power Administration, Draft Environmental Assessment, Yakima Basin Fish Passage Project - Phase II. Boise, Idaho, and Portland, Oregon. October, 1990.

The following individuals were met with or contacted by phone for information while writing this biological assessment.

1. Mark Hinschberger, Naches Ranger District, U.S. Forest Service
2. Chuck Keller, Yakima Project Office, U.S. Bureau of Reclamation
3. Jim Michaels, Olympia Field Office, U.S. Fish and Wildlife Service
4. Tom Owens, Olympia Office, Washington Department of Wildlife
5. Jo Ellen Richards, Cle Elum Ranger District, U.S. Forest Service
6. Lee Stream, Yakima Region Office, Washington Department of Wildlife
7. Mike Tehan, Moses Lake Field Office, U.S. Fish and Wildlife Service

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Fish and Wildlife Enhancement
2625 Parkmont Lane SW, Bldg B
Olympia, Washington 98502
206/753-9440 FTS 434-9440

January 12, 1990

151 1/16
152 1/16
1/16

Memorandum

COPI MADE FOR YAK. PROJ. OFF.
1-17-90

To: Regional Environmental Officer, Bureau of Reclamation
Pacific Northwest Region, Boise, Idaho

From: Acting Field Supervisor, Fish and Wildlife Service
Olympia Field Office, Olympia, Washington

Subject: Request for List of Endangered or Threatened Species for Sixty-six
Yakima River Basin Fish Passage Improvement Projects in Benton,
Kittitas, and Yakima Counties, Washington (1-3-90-SP-193)

Attached is a list of endangered and threatened species (Attachment A) that may be present in the area of the proposed (66) fish passage improvement projects in Benton, Kittitas, and Yakima counties, Washington, as requested in your memorandum, dated December 14, 1989, and received in this office on December 18. The list fulfills the requirement of the Fish and Wildlife Service under Section 7(c) of the Endangered Species Act of 1973, as amended. The requirements for Bureau of Reclamation compliance under the Act are outlined in Attachment B.

Should the biological assessment determine that a listed species is likely to be affected (adversely or beneficially) by the project, the Bureau of Reclamation should request formal Section 7 consultation through this office. Even if the biological assessment shows a "no effect" situation, we would appreciate receiving a copy for our information.

Also included is a list of candidate species presently under review by this Service for consideration as endangered or threatened. Candidate species have no protection under the Endangered Species Act, and a determination of "may affect" for candidates does not require preparation of a biological assessment or consultation with the Fish and Wildlife Service. Candidate species are included simply as advance notice to federal agencies of species which may be proposed and listed in the future. If early evaluation of your project indicates that it is likely to adversely impact a candidate species, the Bureau of Reclamation may wish to request technical assistance from this office.

Your interest in endangered species is appreciated. If you have additional questions regarding your responsibilities under the Act, please contact Jim Michaels or Jeff Haas of my staff at the letterhead phone/address.

Sincerely,

A handwritten signature in cursive script, reading "Lynn P. Childers".

Lynn P. Childers
Acting Field Supervisor

Attachments

c: FWS, Boise (Parenti)
WDW (Nongame)
WNHP

JWH:gb

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND
CANDIDATE SPECIES THAT MAY OCCUR WITHIN THE AREA OF THE PROPOSED
SIXTY-SIX FISH SCREENING FACILITY IMPROVEMENT AND CONSTRUCTION PROJECTS
IN BENTON, KITTITAS, AND YAKIMA COUNTIES, WASHINGTON

1-3-90-SP-193

LISTED

Bald eagle (*Haliaeetus leucocephalus*) - wintering bald eagles may occur in the vicinity of all projects near the Tieton, Teanaway, Naches and Yakima rivers from about October 31 through March 31.

If work other than minimal modification to existing screening facilities is to occur (i.e., facility replacement or new construction of such facilities; powerline construction; and/or access road construction), the following concerns should be addressed in your assessment of project impacts to bald eagles:

1. Level of use of the project area by bald eagles.
2. Effect of the project on the eagle's primary food stocks and foraging areas in all areas influenced by the project.
3. Impacts from project-related activities which may result in disturbance to bald eagles and/or their avoidance of the project area.
4. Impacts of access road construction and placement, and/or utility powerline construction and placement, which may result in eagle disturbance, habitat loss, powerline collisions, and electrocutions of bald eagles.

PROPOSED

None

CANDIDATE

Lomatium tuberosum (Hoover's desert parsley) may occur in the vicinity of projects #7 and #8.

Erigeron basalticus (basalt daisy) may occur in the vicinity of projects #7 and #8.

Tauschia hooveri (Hoover's tauschia) may occur in the vicinity of projects #26 and #27.

Attachment A

FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7(a) AND 7(c) OF THE ESA

SECTION 7(a) - Consultation/Conference Requires:

1. Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;
2. Consultation with the Service when a Federal action may affect a listed endangered or threatened species to ensure that any action authorized, funded, or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after it has determined whether its action may affect (adversely or beneficially) a listed species; and
3. Conference with the Service when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or an adverse modification of proposed critical habitat.

SECTION 7(c) - Biological Assessment for Construction Projects *

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to determine whether any proposed and/or listed species are likely to be affected by a construction project and whether consultation/conference is required. A BA is required to include an evaluation of impacts to proposed species only when both listed and proposed species occur within the project area. Although the preparation of a BA is not required when only proposed species are present, it would assist the Federal agency in determining whether conferencing is required. The process is initiated by a Federal agency when that agency requests a list of proposed and listed threatened and endangered species. The BA should be completed within 180 days after its initiation (or within a mutually agreeable time period). If the BA is not initiated within 90 days of receipt of the species list, please verify the accuracy of the list with the Service. No irreversible commitment of resources is to be made during the BA process which would result in violation of the requirements under Section 7(a) of the Act. Planning, design, and certain administrative functions may be undertaken; however, the Federal agency cannot commit funds, issue licenses or permits, or carry out actions until the Section 7 process is completed.

To complete the BA, your agency or its designee should: (1) conduct an onsite inspection of the area to be affected by the proposal, which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or potential reintroduction of the species; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within the Service, National Marine Fisheries Service, State conservation departments, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures; and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevant information. Upon completion the report should be forwarded to our Endangered Species Division, 2625 Parkmont Lane SW, Bldg. B, Olympia, WA 98502.

.....
* "Construction project" means any major Federal action which significantly affects the quality of the human environment (requiring an EIS), designed primarily to result in the building or erection of human-made structures such as dams, buildings, roads, pipelines, channels, and the like. This includes Federal actions such as permits, grants, licenses, or other forms of Federal authorization or approval which may result in construction.

ATTACHMENT B

CURT SMITCH
Director

STATE OF WASHINGTON
DEPARTMENT OF WILDLIFE

600 North Capitol Way, GJ-11 • Olympia, Washington 98504-0091 • (206) 753-5700

January 3, 1990

150. 002 1/8
151. RA 1/9
152. RP 1/9

Douglas J. James
Department of the Interior
Bureau of Reclamation
Federal Building & US Courthouse
Box 043-550 West Fort Street
Boise, Idaho 83724-0043

RE: YAKIMA RIVER BASIN FISH PASSAGE IMPROVEMENTS - PN 151

Dear Mr. James:

Enclosed are the results from screening the 66 proposed Yakima River Basin Fish Passage Improvements - Phase II Fish Screens projects against our species of concern database. The report is sorted in the same order as your request listed the projects. We have no data on species of concern occurring within the section of those projects not included in the printout.

Our primary concern is the possibility of disturbing nesting avian species during project construction. When known, nest locations of species of concern are shown to the nearest quarter/quarter section. It seems unlikely your projects would adversely affect the following species of concern listed in the printout: American painted lady butterfly, ring-necked snake, and mountain sucker.

I hope this information is useful. Please contact me if you need further information.

Sincerely,

Thomas E. Owens, Manager
Nongame Data Systems

c: Lee Stream
Ted Clausing
John Mankowski

ENCL.

DATA RETRIEVAL FOR: BUREAU OF RECLAMATION
PROJECT: YAKIMA RIVER BASIN FISH PASSAGE IMPROVEMENTS - PHASE II (FISH SCREENS)
SPECIES OF CONCERN DOCUMENTED TO OCCUR WITHIN 1 MILE OF FISH SCREENS
FEDSTAT= FEDERAL STATUS: FE= ENDANGERED, FT= THREATENED, FS= SENSITIVE, blank= NONE
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UNITNO=2 SITE=SNIPES/ALLEN									
CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRR			
Osprey	Pandion haliaetus			435	1	T11N R20E S17 SE0FSW			

UNITNO=3 SITE=BOISE-CASCADE									
CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRR			
American painted lady	Cynthia virginienis			1	1	T13N R19E S07 SW0FNW			

UNITNO=4 SITE=UNION GAP									
CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRR			
American painted lady	Cynthia virginienis			1	1	T13N R19E S07 SW0FNW			

UNITNO=5 SITE=MOXEE									
CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRR			
American painted lady	Cynthia virginienis			1	1	T13N R19E S07 SW0FNW			

UNITNO=6 SITE=HUBBARD									
CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRR			
American painted lady	Cynthia virginienis			1	1	T13N R19E S07 SW0FNW			

UNITNO=8 SITE=SELAH-MOXEE									
CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRR			
Mountain sucker	Catostomus platyrhynchus			4	1	T14N R19E S08			

UNITNO=9 SITE=MCAUSLAND									
CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRR			
Osprey	Pandion haliaetus			669	1	T17N R18E S24 SWSESE			

DATA RETRIEVAL FOR: BUREAU OF RECLAMATION

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----- UNITNO=16 SITE=ELLENSBURG MILL -----

CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRS
Osprey	Pandion haliaetus			398	1	T10M R10E S29 NEOFSE
Osprey	Pandion haliaetus			523	1	T10M R10E S29 NWOFNW
Osprey	Pandion haliaetus			667	1	T10M R10E S29 NWNESW

----- UNITNO=32 SITE=SCOTT -----

CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRS
Lewis' woodpecker	Melanerpes lewis		FS	13	1	T14M R17E S04

----- UNITNO=33 SITE=BREWER -----

CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRS
Lewis' woodpecker	Melanerpes lewis		FS	13	1	T14M R17E S04

----- UNITNO=34 SITE=KELLY/LOWRY -----

CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRS
Lewis' woodpecker	Melanerpes lewis		FS	13	1	T14M R17E S04

----- UNITNO=35 SITE=KELLY/LOWRY -----

CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRS
Lewis' woodpecker	Melanerpes lewis		FS	13	1	T14M R17E S04

----- UNITNO=38 SITE=WAPATOX -----

CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRS
Ring-necked snake	Diadophis punctatus			14	1	T15M R16E S36
Golden eagle	Aquila chrysaetos			117	1	T15M R16E S36 SW
Golden eagle	Aquila chrysaetos			117	2	T15M R16E S36 SW
Golden eagle	Aquila chrysaetos			117	3	T15M R16E S36 NEOFNW

----- UNITNO=44 SITE=ANDERSON -----

CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEQNO	TRS
Spotted owl	Strix occidentalis	SE	FP	744	1	T17M R14E S35
Spotted owl	Strix occidentalis	SE	FP	804	1	T17M R14E S35 OFNW

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----- UNITNO=47 SITE=GNAVAUGH -----

CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEOMO	TRS
Prairie falcon	Falco mexicanus			77	1	T14M R16E S09

----- UNITNO=48 SITE=BECK -----

CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEOMO	TRS
Prairie falcon	Falco mexicanus			167	1	T15M R16E S03

----- UNITNO=49 SITE=MCDANIELS -----

CHCOMNAM	CHSCINAM	STASTAT	FEDSTAT	OCCUR	SEOMO	TRS
Prairie falcon	Falco mexicanus			167	1	T15M R16E S03

IN REPLY
REFER TO
PN 151

United States Department of the Interior

BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
BOISE, IDAHO 83724-0043

DEC 15 1989

Mr. Tom Owens
Washington Department of Wildlife
600 Capitol Way North
Olympia WA 98501-1091

Subject: Yakima River Basin Fish Passage Improvements - Phase II Fish Screens
(Endangered Species)

Dear Mr. Owens:

The Bureau of Reclamation is completing construction of the first phase of the Yakima River Basin Fish Passage program. We are presently in the design stage of Phase II of this program. In compliance with the Endangered Species Act, we have written the Olympia Field Office of the U.S. Fish and Wildlife Service requesting a list of threatened and endangered species that could occur in the Phase II project area. In order to fully comply with the intent of the Endangered Species Act, we would like to assess the effects of the Phase II project on state listed species of special concern. We would appreciate receiving this list from you in the near future.

Enclosed for your information and use is a location map, a narrative of the proposed action, a design and construction schedule, and descriptions of each of the 66 proposed project sites. If you have any questions concerning the proposed project, please call Richard Prange at (208) 334-1208, or Bob Adair at (208) 334-1209.

Sincerely,

DOUGLAS J. JAMES

Regional Environmental Officer

Enclosures

IN REPLY
REFER TO
PN 151

United States Department of the Interior

BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
BOISE, IDAHO 83724-0043

1983

Memorandum

To: Field Supervisor, Fish and Wildlife Service, Olympia Field Office,
2625 Parkmont Lane SW., Building B, Olympia WA 98502

From: Regional Environmental Officer, Bureau of Reclamation, Boise ID

Subject: Request for List of Threatened and Endangered Species, Endangered
Species Act, Yakima River Basin Fish Passage Improvements, Phase II
Fish Screens, Yakima, Washington (Endangered Species Act)

We are requesting a list of threatened and endangered plant and animal species in accordance with the Endangered Species Act for the subject project. The proposed project would construct, upgrade, or retrofit state-of-the-art juvenile fish protective facilities at approximately 66 irrigation diversions on the main stem and several tributaries of the Yakima River. All but three of the 66 diversions have existing screens and juvenile bypass facilities.

Enclosed for your information and use is a location map, a narrative of the proposed action, a design and construction schedule, and descriptions of each of the 66 proposed project sites. If you have any questions concerning the proposed project, please call Richard Prange at FTS 554-1208, or Bob Adair at FTS 554-1209.

DOUGLAS J. JAMES

Enclosures

END

**DATE
FILMED**

11 / 19 / 91