US Army Corps of Engineers ®
Walla Walla District
BUILDING STRONG®

MULTIPLE PUMP INTAKE EASEMENT RENEWALS

Columbia, Snake and Yakima Rivers

McNary and Ice Harbor Projects

PM-EC-2014-0031

Biological Assessment
for

Threatened and Endangered Species,
Critical Habitat, and Essential Fish Habitat

Under the Jurisdiction of:
National Marine Fisheries Service
and
U.S. Fish and Wildlife Service

ADMINISTRATIVE RECORD – DO NOT DESTROY

U.S. Army Corps of Engineers
Walla Walla District
Environmental Compliance Section

July 2015

SUMMARY

This biological assessment (BA) is prepared pursuant to section 7(a)(2) of the Endangered Species Act (ESA) to evaluate effects of real estate easement renewals on public lands managed by the U.S. Army Corps of Engineers, Walla Walla District (Corps) on listed species under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) (when combined, Services). Authority for this action is presented under Title 10, United States Code, Section 2668.

This BA is separated into two parts (batches): one for pumping plants that currently meet screen mesh size criteria (n=11) and have Not Likely to Adversely Affect (NLAA) determinations on all of the ESA-listed fish species, and one for pumping plants that do not meet screen mesh size criteria (n=12) and have a Likely to Adversely Affect (LAA) determination for Snake River fall Chinook (fry). Other ESA-listed fish species include Upper Columbia River spring Chinook, Upper Columbia River steelhead, Middle Columbia River steelhead, Snake River sockeye, Snake River spring/summer Chinook, Snake River steelhead and Columbia Basin bull trout. Both batches are contained in this BA. The Corps is seeking concurrence from the Services with our NLAA determination for Batch 1 and for bull trout and a biological opinion from NMFS for our LAA determination for Batch 2.

The Corps concludes that the proposed actions will have “No Effect” on pygmy rabbit, Canada lynx, gray wolf, grizzly bear, Ute ladies’-tresses, White Bluffs bladderpod, Umtanum Desert buckwheat, yellow-billed cuckoo, Washington ground squirrel, northern wormwood, or greater sage-grouse. In addition, this document analyzes the project's likely effects on essential fish habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act. The Corps has also determined that the proposed project would result in no take of species listed under the Migratory Bird Treaty Act, and no disturbance or take under the Bald and Golden Eagle Protection Act.

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Acronym Glossary

BA	Biological Assessment
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
CFR	Code of Federal Regulations
CFS	Cubic feet per second
Corps	Walla Walla District, U.S. Army Corps of Engineers
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
ESA	Endangered Species Act of 1973, as amended
ESU	Evolutionarily Significant Unit
FCRPS	Federal Columbia River Power System
FPC	Fish Passage Center
FR	Federal Register
FWCA	Fish and Wildlife Coordination Act
HMU	Habitat Management Unit
HUC	Hydrologic Unit Code
ICTRT	Interior Columbia Basin Technical Recovery Team
MBTA	Migratory Bird Treaty Act
MCR	Middle Columbia River
MPG	Major Population Group
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
PCE	Primary Constituent Element
PL	Public Law
USFWS	U.S. Fish and Wildlife Service

1 Federal Action

1.1 Introduction

The U.S. Army Corps of Engineers, Walla Walla District (Corps) proposes to renew easements to multiple irrigators along the Columbia, Snake, and Yakima Rivers (*e.g.* Figures 1 and 2) for irrigation pump structures/facilities. Authority for this action is presented under Title 10, United States Code, Section 2668.

This action will extend the easements for another 25 year term. The irrigators presently utilize land owned by the Federal government and managed by the Corps. This biological assessment (BA) is prepared pursuant to section 7(a)(2) of the Endangered Species Act (ESA) to evaluate effects of the proposed activities on Corps managed lands to listed species and their critical habitats under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS).

This BA is written in two parts (batches) for NMFS; Batch 1) for pumping facilities that meet current fish screen mesh size criteria (informal consultation), and Batch 2) for facilities that do not meet current screen mesh size criteria (formal consultation for Snake River fall Chinook). We are requesting informal consultation with USFWS for both batches. The most significant parameter in determining which batch a pump site is placed in is screen mesh size. A mesh size of 3/32 inch (”) (0.0938” or 2.38mm) is the current requirement (NMFS 2011). Intakes with screen mesh sizes of 3/32” or less are contained in Batch 1. Intakes with screen mesh sizes larger than 3/32” are contained in Batch 2. Pumping plants in Batch 2 will be required to update their screens to the current fish screening criteria, including, but not limited to screen mesh size (NMFS 2011). The Corps proposes an implementation schedule for all of the non-compliant screens to be replaced by the end of 2020. Once the screens are replaced with screens that meet screening requirements, they will no longer pose an adverse effect on ESA-listed fish species. Screen details such as mesh size were supplied by the screen owner or their inspectors. Any details related to the screens were not verified by the Corps due to a lack of accessibility.

An exception to the batching method described above is if no fry-sized ESA-listed salmon (Snake River fall Chinook) might be located near the pumping facility. In this case screen mesh sizes up to 1/8” (0.125” or 3.18mm) are placed in Batch 1. This exception applies on the Columbia River upstream from the confluence with the Snake River or on the north/west shore of the Columbia River. It is highly unlikely that any Snake River fall Chinook fry could cross the entire Columbia River and be found on the north Columbia River shoreline.

Other important intake screen parameters include: 1) screens function and are operated and maintained as designed, and 2) when the screen material is damaged or wears out, it is replaced with material meeting current screen criteria, regardless of location.

Figure 1. Irrigation pump stations with real estate easements to be renewed.

Figure 2. Residential pump intake sites on the Columbia River.

1.2 Previous Consultations

The Corps completed formal consultation with NMFS on the McNary Shoreline Management Plan on April 14, 2011 (2010/03597). The USFWS provided their concurrence on the Corps not likely to adversely affect determination for bull trout on November 19, 2010 (13410-2010-I-0485).

On July 2, 2011 Mr. Dale VanSchoiack, DGV Consulting, PLLC received a letter from Mr. Keith Kirkendall, NMFS, documenting NMFS review of the Franklin County Irrigation District River Pumping Station 2 and the applicability of “grandfathering provisions” to water intake screening criteria.

On January 3, 2013 the Corps completed formal consultation with USFWS for the Stahl H.B. and JSH Farm River Pumping Station: Fish Screening and Intake Modification Project (OIEOFW00-2013-F-0003). Formal consultation with NMFS was completed on December 20, 2012 (NWR-2012-4014).

On January 17, 2014 the Corps completed consultation with NMFS on the Remand for Operations of the Federal Columbia River Power System (FCRPS) (NWR-2013-9562). Several other consultations on the FCRPS have occurred in the past.

On August 8, 2014 the Corps requested formal consultation with the Services on the West Pasco Water Treatment Plant New Water Intake project. A biological opinion from NMFS was received in July 2015 and a biological opinion from the USFWS is pending.

On October 17, 2014 the Corps completed informal consultation with NMFS on the Butterfield Water Treatment Plant Intake Modifications (WCR-2014/1507).

1.3 Environmental Baseline

The Columbia and Snake Rivers are large river systems with many uses and activities that affect them. This environmental baseline description focuses on the uses that correlate directly to the irrigation pump plants which are the subject of this biological assessment.

There are multiple irrigation pumping plants located on the Columbia, Snake and Yakima Rivers. Each of these plants has an easement to cross federally-owned land managed by the Corps. Many of the easements have expired or will soon expire. This BA addresses 23 of these pump plants. The pump plants range in size from individual landowners with submersible pumps to irrigate their lawns, to corporate farms with multiple, high-horsepower pumps to irrigate thousands of acres of cropland. In addition to these 23 pump plants, there are hundreds of other water users in the Columbia Basin, ranging from large irrigation projects to individual wells. All of these water withdrawals act to reduce the total flow of the Columbia River, especially during the growing season.

The natural hydrograph has been altered by storage dams upstream from the project area. The Columbia River average daily flow is shown in Figure 3. It is unclear exactly how much water is withdrawn from, or discharged to, the Columbia and Snake rivers in the action area.

Irrigation waters often return to these rivers with increased levels of nutrients, sediments, pesticides and temperatures. Each of these can have negative effects on the aquatic environment.

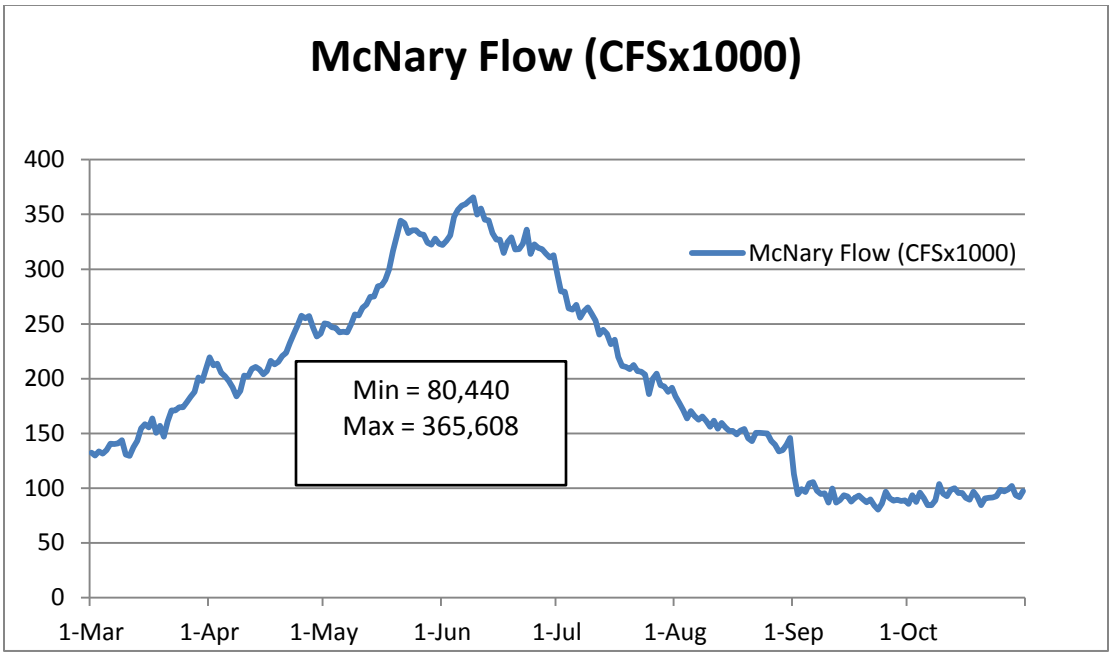

Figure 3. Average daily flow at McNary Dam during the growing season.

The Corps does not manage, monitor or control water rights associated with this action. The Washington Department of Ecology (Ecology) manages water within the state to ensure maximum net benefits from water use. It is the state's policy to promote the use of the public waters to obtain maximum net benefits arising from both diversionary uses and the retention of waters within streams and lakes in sufficient quantity and quality to protect instream and natural values and rights (RCW 90.03.005).

The proposed easement renewals do not grant irrigators any right to use/withdraw water from the Columbia, Snake or Yakima rivers and will not increase water withdrawals. The State of Washington decides where (and for what purpose) water within the state will be put to beneficial use, not the Corps. An irrigators' right to withdraw water is the result of state issued/recognized water rights. It is reasonable to believe that Ecology would designate a different beneficial use for such water elsewhere (consumptive or in-stream) if the irrigators ceased withdrawing water for irrigation purposes. This BA therefore does not assess potential effects associated with water intake withdrawals as

part of the potential direct/indirect effects of the proposed action. Such effects are considered in the cumulative effects analysis (Section 3.3).

Minimum Columbia River flows within McNary pool have been developed to protect fish and other water-dependent resources. Table 1 shows the minimum flows for various periods through the year. The river has minimum instream flows that have been established under WAC 173-563-040(1). These instream flows place constraints on water rights and permits that have been issued with restrictions that limit use of the water.

Table 1. Minimum instantaneous flows for instream uses within the McNary pool. WAC 173-563-040(1). The lowest minimum instream flow is (50,000 cfs). Actual average minimum daily flow (80,440 cfs) is higher than the required minimum flow.

Date	In-River CFS
April 1-15	50,000
April 16-25	70,000
April 26-30	70,000
May 1-31	70,000
June 1-15	70,000
June 16-30	50,000
July 1-15	50,000
July 16-31	50,000
August	50,000
September	50,000

1.4 Proposed Action

1.4.1 Locations

The Corps proposes to renew easements to 23 irrigators along the Columbia, Snake, and Yakima Rivers. These renewals will extend the easements for another 25 year term. Table 2 lists the location and official easement code for each of the irrigators. A short description of each pumping site is presented. This information was provided by the pump plant owners or in some cases contractors who inspected the intakes for the owners. The proposed action includes renewal of the easements for all of the sites in Batch 1 and 2. Sites in Batch 1 are currently operating within the NMFS screening criteria or are in areas where salmon fry would not be affected by the screens, while sites in Batch 2 require an upgrade to meet current screening criteria (NMFS 2011). Routine operation and maintenance of the intake sites is also part of the proposed action for all sites.

Table 2. Description of Irrigation Pump Intakes.

Ref #	Site Name	Township, Range, Section	Easement #
	BATCH 1 (NLAA)		
1	Stemilt Ag Services WDNR	T 10 N, R 32 E, S 23	DACW68-2-77-19
2	Anderson	T 11 N, R 28 E, S 25	DACW68-2-86-72
3	Kosmata	T 10 N, R 28 E, S 25	EF-2-06-03
4	Lewis-O'Hearn	T 10 N, R 28 E, S 26	DACW68-2-92-7
5	Zirkle	T 10 N, R 28 E, S 25	DACW68-2-01-18
6	Wadhwa	T 10 N, R 28 E, S 25	DACW68-2-01-7
7	Central Pre-Mix Concrete	T 9 N, R 28 E, S 12	DACW68-2-96-24
8	City of Pasco	T 9 N, R 29 E, S 18 & T 9 N, R 31 E, S 31	DACW68-2-92-4
9	Farmland Reserve	T 5 N, R 28 E, S 2	DACW68-2-91-11
10	Premier Farms	T 9 N, R 31 E, S 21	DACW68-2-75-9
11	Valley Roz	T 9 N, R 31 E, S 28	DACW68-2-73-47
	BATCH 2 (LAA)		
12	T&R Farms	T 10 N, R 32 E, S 13	DACW68-2-75-28
13	Stemilt 2 (with T&R Farms)	T 10 N, R 32 E, S 13	DACW68-2-75-28
14	Broetje Orchards	T 10 N, R 32 E, S 24	DACW68-2-76-17
15	Flat Top	T 9 N, R 31 E, S 28	DACW68-2-73-47
16	Goose Pond	T 9 N, R 31 E, S 28	DACW68-2-73-47
17	Conley Shultz	T 9 N, R 31 E, S 28	DACW68-2-73-47
18	Kal Farms	T 9 N, R 31 E, S 28	DACW68-2-72-66
19	Staeheli	T 10 N, R 28 E, S 25	DACW68-2-02-07
20	City of Richland	T 10 N, R 28 E, S 35&36	DA-45-164-CIVENG-63-46
21	Badger Mountain Irrigation Dst	T 9 N, R 28 E, S 23	DACW68-2-76-36
22	C-2L Inc- JB Land, LLC	T 5 N, R 30 E, S 18	DACW68-2-73-94
23	Royale Columbia Farms	T 5 N, R 30 E, S 7&8	DACW68-2-74-55

<u>BATCH 1</u> (informal consultation)

The water intake sites in Batch 1 all have either screens with a mesh size of 3/32" or less, or would not impact Snake River fall Chinook fry. The Corps will not require any modification to these screens as long as they continue to function as designed and are cleaned/maintained as needed. When the screen material wears out, it must be replaced with screen material meeting the most recent NMFS screening criteria. To comply with this condition, structural modifications may be required to retrofit an existing facility with new screen material.

Periodic maintenance to the intake screens will occur. The most frequent maintenance will be cleaning the exterior of the screens of any debris and algae. Screen cleaning will occur annually at a minimum, or as often as needed to maintain adequate flow. Some of the screens already have automatic cleaning systems. Screen cleaning could occur at any time of year.

1. Stemilt Ag Services (being sold to WDNR). Franklin County. 46°19'55.00", 118°45'60.00". This site is located on the south side of the Snake River approximately nine miles upstream from Ice Harbor Dam. This site contains a water pumping plant

and irrigation distribution pipeline. The easement grantee's shared permit with T&R Farms (DACW68-2-75-28) will be replaced with a separate easement for its water use at the T&R pump station. There will be two Stemilt pipe intakes under future conditions and eight pumps. The 3-foot diameter stainless steel fish screens will be/have been replaced to meet current fish screening requirements (NMFS 2011) with a screen mesh size of 3/32" (2.38mm). The site has a water right priority dating to 1985. The water pumping plant was constructed under the prior land owner in 1975, and withdraws about 5.6 cfs.[1] There is one right for 400 acre-feet per year (afy) and one for 1,310 afy. The federal action does not involve any facility alterations or ground disturbance.

2. Anderson. Franklin County. 46°25'01.67"N, 119°15'30.35"W. This site contains a water pump plant and pipeline extending west to the east shore of the Columbia River. The facility is located east of Wooded Island's south end at River Mile 348.3. The 8-inch diameter PCV intake pipe's stainless steel fish screen will be replaced with a Pacific-Ag Pump Rite screen to meet NMFS (2011) criteria and cleaned annually. The water pumping plant was installed in 1965 and has a priority water right for its pumps dating to 1986. There is also a certificate of surface water right on record dating to 1955. The water right is for 350 gpm (about 0.8 cfs, or 565 afy). The federal action does not involve any facility alterations or ground disturbance.

3. Kosmata. Benton County. 46°19'37.65"N, 119°15'38.48"W. This easement is for an individual landowner with a small submersible pump. It is located on the west side of the Columbia River at the upper end of Lake Wallula. The PVC pump intake pipe is annually installed for use during the irrigation season as per owner's water right held since 1980. The stainless steel fish screen has a mesh size of 3/32" (2.38mm) and is cleaned manually as needed. The water pump was installed in 1992. The site withdraws about 0.045 cfs or a maximum of 1 afy. The federal action does not involve any facility alterations or ground disturbance.

4. Lewis-O'Hearn. Benton County. 46°19'34.24"N, 119°15'37.71"W. This easement is for an individual landowner with a water pump and 2-inch diameter stainless steel pipeline leading east from the west shore of the Columbia River in upper Lake Wallula. The pump's fish screen has a mesh size of less than 1/8" (<3.175mm) and is cleaned annually by hand. The landowner has held a primary water right since 1966. The residential water pumping system was installed the same year. The site withdraws about 0.01 cfs or up to 2 afy. The federal action does not involve any facility alterations or ground disturbance.

5. Zirkle. Benton County. 46°19'31.39"N, 119°15'37.25"W. This easement is for an individual landowner with a small water pump. There is one pipe intake and pump located on the west side of the Columbia River at the upper end of Lake Wallula. The pump is taken out of the water during the winter beginning in November. The PVC pipe has a 4 by 18-inch size fish screen made of stainless steel with a mesh size of 1/25" (1mm) and is cleaned of debris manually as needed. The Zirkle easement has held a

[1] Water withdrawal information is provided here in Section 1.4 for purposes of the cumulative effects analysis (Section 3.3) only.

water priority right dating to 1980. This residential water pump plant dates to 2001. About 0.01 cfs, or up to 1.4 afy is withdrawn from the site. The federal action does not involve any facility alterations or ground disturbance.

6. Wadhwa. Benton County. 46°19'27.38", 119°15'36.62"W. This easement is for an individual landowner with a small water pump. There is one pipe intake and pump located on the west side of the Columbia River at the upper end of Lake Wallula. The pump is removed from the reservoir each winter beginning in November. The pipe has a 30 series fish screen with a mesh size of 0.075" (1.9mm) made of stainless steel with andozided aluminum insides. It is a Pump-Rite model MM-L15 fish screen. The Wadhwa easement has a water right with a priority right dating to 1980. The existing water pumping plant dates to 2001. About 0.01 cfs, or up to 2.14 afy is withdrawn from the site. The federal action does not involve any facility alterations or ground disturbance.

7. Central Pre-Mix Concrete. Franklin County. (Batch 1, EXCEPTION) 46°16'16.30"N, 119°15'14.27"W. This site contains a water pump, access road, an electrical line, and a stainless steel intake pipeline that leads to the east shore of the Columbia River (River Mile 337). The federal action does not involve any facility alterations, or ground disturbance. The fish screen has a mesh size of 1/8" (3.18mm) and is cleaned annually by hand. The water right was originally acquired in 1955 for the purpose of washing gravel. The 1996 Corps easement was for the construction of the water pump plant. The site withdraws about 1.1 cfs, totaling about 796 afy. The intake pipe was re-furbished in 1994**.**

8. City of Pasco. Franklin County. 46°15'57.09"N, 119°14'28.39"W. This site contains a water pump plant and 30-inch diameter pipeline on the east shore of the Columbia River (River Mile 336.1). The pipeline extends to within the US-1658 highway ROW. Its intake pipe fish screen has a mesh size of 7/100" (1.75mm) and is cleaned annually. The easement primary water right dates to 1963 and a super-ceding water right since 1971. The plant was installed in approximately 1990 and its intake pipe in 2003. The water right for this site is 35 cfs or 7,000 afy. The federal action does not involve any facility alterations or ground disturbance.

9. Farmland Reserve. Benton County. (Batch 1, EXCEPTION) 45°16'48.34"N, 119°16'36.31"W. Farmland Reserve acquired this easement and its water rights in 2009. The easement is for a ROW serving the operation and maintenance of a water pump plant and pipeline leading south to the north shore of the Columbia River (River Mile 293) just upstream from McNary Dam. The easement dates to 1976 with a priority water right to 1970. The water pump plant was installed in approximately 1980 and additional pumps installed in the 1990s. The intake pipe's fish screen has a mesh size of 1/8" (3.18mm) and is cleaned annually. The site's water right is for 115 cfs, or 82,956 afy. The federal action does not involve any facility alterations or ground disturbance.

10. Premier Farms. Franklin County. 46°14'22.34"N, 118°56'56.56"W. This easement was combined from one dating from 1974 and a second from 1994. Each

easement was for four water pumps on a shared 1970s water pump platform supported by a shared 1973 priority water right. The Corps will renew the current easement ROW for the operation and maintenance of six water pumps and seven stainless steel pipelines on the north shore of the Snake River (River Mile 6.5). The intake pipes' fish screens have a mesh size of 3/50 (1.5mm) and are cleaned annually by hand. The water right for the site is for 16.9 cfs, or 3,072 afy. The federal action does not involve any facility alterations or ground disturbance.

11. Valley Roz. Walla Walla County. 46°14'11.84"N, 118°56'58.19"W. The 1971 built pump station is at Snake River Mile 6.5 on the south side of McNary Reservoir. Additional facility pumps were added in 1973 and 1978, and one was overhauled in 2009. Priority water rights have been held by the landowners since 1978. There are eight intakes at the shared pump station: Valley Roz Orchards (No. 1), Conley and Schultz Farms (No. 2 and 3), and Flat Top Farms (No. 4-6) and Washington State Department of Natural Resources (No. 7-8). The intake pipe's fish screens (nylon or stainless steel) have a mesh size of 3/32" and are cleaned annually either using internal water jet nozzles, or manually when inspected. The site's water right is for 5.3 cfs, or 1,110 afy. The federal action will not involve any facility alterations or ground disturbance.

BATCH 2 (Screen Updates Required, formal consultation)

The sites in Batch 2 all have screen mesh sizes larger than 3/32" and do not meet NMFS (2011) criteria. The Corps proposes an implementation deadline of the end of 2020 to upgrade these screens. New screens must be in compliance with the most current NMFS intake screening criteria (currently NMFS 2011). The approach velocity must not exceed 0.40 ft/s for active screens, or 0.20 ft/s for passive screens. Using these approach velocities will minimize screen contact and/or impingement of juvenile fish. For screen design, approach velocity is calculated by dividing the maximum screened flow amount by the vertical projection of the effective screen area.

Once a site is upgraded to the current fish screening criteria, it will not need to be upgraded again as long as the following conditions are met.

1. The entire screen facility must function as designed.
2. The entire screen facility has been maintained and is in good working condition.
3. When the screen material wears out, it must be replaced with screen material meeting the most recent NMFS screening criteria. To comply with this condition, structural modifications may be required to retrofit an existing facility with new screen material.
4. No mortality, injury, entrainment, impingement, migration delay or other harm to anadromous fish has been noted that is being caused by the facility.
5. When biological uncertainty exists, access to the diversion site by the Corps and NMFS is permitted by the diverter for verification of the above criteria.

Periodic maintenance to the intake screens will occur. The most frequent maintenance will be cleaning the exterior of the screens of any debris and algae. Screen cleaning will occur annually at a minimum, or as often as needed to maintain adequate flow. Some of the screens already have automatic cleaning systems. Screen cleaning could occur at any time of year.

12. T&R Farms. Franklin County. 46°20'31.14"N, 118°45'33.18"W. This site is located on the south side of the Snake River about ten miles upstream of Ice Harbor Lock and Dam. The site contains a water pumping plant and irrigation distribution pipeline. The buried pipelines extend 40 feet out into the reservoir and rest 20' below surface. The configuration of the intake structure includes six intake pumps and 3-foot diameter stainless steel pipes with barrel screens. The intake structure is a pile-supported structure with screens that wrap around the perimeter. The external screens extend 5' below water line. Barrel screens are approximately 10' tall and the bottoms of the screens are located at approximately 20' water depth.

The existing screens have 1/8" (3.18mm) openings. All screens are of stainless steel materials, and appear to be in good condition. These barrel screens do not have a self cleaning system. All six screens are in good condition. This site has a water right priority dating to 1985 that total 35.75 cfs, or up to 12,776 afy. The water pumping plant was constructed in 1975. The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011). The action does not involve any ground disturbance. This site was placed in Batch 2 because it is located on the Snake River and has screen mesh sizes greater than 3/32".

13. Stemilt 2. Franklin County. 46°20'31.14"N, 118°45'33.18"W. This site is located on the south side of the Snake River about ten miles upstream of Ice Harbor Lock and Dam. The site contains a water pumping plant and irrigation distribution pipeline. The buried pipelines extend 40 feet out into the reservoir and rest 20' below surface. The configuration of the intake structure includes six intake pumps and 3-foot diameter stainless steel pipes with barrel screens. The intake structure is a pile supported structure with screens which wrap around the perimeter. The external screens extend 5' below water line. Barrel screens are approximately 10' tall and the bottoms of the screens are located at approximately 20' water depth. The screens have a mesh size of 1/8" (0.125" or 3.18mm). Water rights for the site total 18.18 cfs or a maximum of 5,363 afy. This site was placed in Batch 2 because it is located on the Snake River and has screen mesh sizes greater than 3/32". The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011).

14. Broetje Orchards. Walla Walla County. 46°19'46.42"N, 118°45'21.46"W. This site is located on the Snake River about nine miles upstream of Ice Harbor Dam. The site contains a water pumping plant and irrigation distribution pipeline. There is one pipe intake and eight pumps. The buried pipeline extends out into the reservoir for 40 feet and has a 3-foot diameter stainless steel screen at its end. The screen mesh size is 1/8" (0.125" or 3.18mm). The plant has a water right priority dating to 1985. The water pumping plant was constructed in 1976. The water right is for 58.1 cfs or a maximum of 13,714 afy. This site was placed in Batch 2 because it is located on the Snake River

and has screen mesh sizes greater than 3/32". The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011).

15. Flat Top. Walla Walla County. 46°14'11.84"N, 118°56'58.19"W. This 1971 built pump station is at Snake River Mile 6.5 on the south side of the McNary Reservoir downstream from Ice Harbor Dam. Flat Top Ranch, LLC has three pumps (150hp, 250hp and 300hp) and an intake pipe. There are three fish screens. Screen mesh sizes are 7/64" (2.78mm), 7/32" (5.56mm), and 1/8" (3.18mm). Additional facility pumps were added in 1973 and 1978, and one was overhauled in 2009. Priority water rights have been held by the landowners since 1971. Water rights for the site total 4.2 cfs or a maximum of 3,041 afy. There are eight intakes at the shared pump station: Valley Roz Orchards (No. 1), Conley and Schultz Farms (No. 2-3), and Flat Top Farms (No. 4-6) and Washington State Department of Natural Resources (No. 7-8). The intake fish screens (nylon or stainless steel) are cleaned annually either using internal water jet nozzles, or manually when inspected. The federal action will not involve any ground disturbance. This site was placed in Batch 2 because it is located on the Snake River and has screen mesh sizes greater than 3/32". The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011).

16. Goose Pond Ag. Inc. Walla Walla County. 46°14'11.84"N, 118°56'58.19"W. Goose Pond Ag. Inc. has two pumps under a Corps easement. The 1971 built pump station is at Snake River Mile 6.5 on the south side of the McNary Reservoir. Priority water rights have been held by the landowners since 1972. There are eight intakes at the shared pump station: Valley Roz Orchards (No. 1), Conley and Schultz Farms (No. 2 and 3), and Flat Top Farms (No. 4-6) and Washington State Department of Natural Resources (No. 7-8). The intake pipe's fish screens (nylon or stainless steel) have a mesh size of 1/5" (4-5mm) and are cleaned annually either using internal water jet nozzles, or manually when inspected. Water rights for this site total 2.6 cfs or a maximum of 1,876 afy. The federal action will not involve any ground disturbance. This site was placed in Batch 2 because it is located on the Snake River and has screen mesh sizes greater than 3/32". The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011).

17. Conley and Schultz. Walla Walla County. 46°14'11.84"N, 118°56'58.19"W. The 1971 built pump station is at Snake River Mile 6.5 on the south side of the McNary Reservoir. Additional facility pumps were added in 1973 and 1978, and one was overhauled in 2009. Priority water rights have been held by the landowners since 1978. There are eight intakes at the shared pump station: Valley Roz Orchards (No. 1), Conley and Schultz Farms (No. 2 and 3), and Flat Top Farms (No. 4-6) and Washington State Department of Natural Resources (No. 7-8). The intake pipes fish screens (nylon or stainless steel) have a mesh size of 4/25" (4mm) and are cleaned annually either using internal water jet nozzles, or manually when inspected. Water rights for the site are 8.7 cfs, or up to 1,810 afy. The federal action will not involve any ground disturbance. This site was placed in Batch 2 because it is located on the Snake River and has screen mesh sizes greater than 3/32". The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011).

18. Kal Farms. Walla Walla County. 46°14'23.76"N, 118°55'47.92"W. This Snake River facility has four pumps (three 80 hp and one 400 hp), and a pipeline with a stainless steel fish screen with a mesh size of 1/8", which is cleaned annually by hand. The land owner has held a primary water right since 1970. The water pump plant was installed between 1972 and 1974. Water rights for this site total 7,785.15 afy. The federal action does not involve any ground disturbance. This site was placed in Batch 2 because it is located on the Snake River and has screen mesh sizes greater than 3/32". The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011).

19. Staeheli. Benton County. 46°19'23.19"N, 119°15'36.20"W. This is a residential water pump plant and irrigation distribution pipeline. The pump and pipe intake lie on the west side of the Columbia River. The 1980 priority water right was originally acquired by the previous owner. The PVC slotted fish screen with 3/16" (4.76mm) cuts is cleaned manually as needed. This residential water pump was installed in 2001. The water right for this site is for 0.1 cfs. The federal action does not involve any ground disturbance. This site was placed in Batch 2 because the "screen" is simply a PVC pipe with slots cut in it. The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011).

20. City of Richland. Benton County. 46°18'53.22"N, 119°15'35.00"W. This site is a city domestic water supply intake structure and overflow pipeline from the Snyder Road filtration plant east to the Columbia River. The screen mesh size is 3/8" (9.52mm). The 12 gauge galvanized steel pipeline's manually operated rotating screen is 34-foot long by 6.5-foot wide and is routinely spray washed. The City of Richland installed the water pumping plant in 1962 and acquired its primary water right. Water rights for this site and other local governments in the Tri-Cities (Quad City water right) total 97,353 afy. The federal action does not involve any ground disturbance. This site was placed in Batch 2 because of the large size of the screen mesh. The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011).

21. Badger Mountain Irrigation District. Benton County. 46°14'46.20"N, 119°16'16.56"W. This pump plant has two transformers and a pipeline leading northeasterly to the Yakima River (River Mile 3.4). The facility irrigates up to 1,240 acres using pumps and an intake pipeline. The intake's stainless steel fish screen has a mesh size of 23/100" (5.84mm) and is cleaned annually by hand and mechanically. The land owner has held a primary water right since 1973. The modern water pumping plant was installed in 1976. Water rights for this site total 22,152 afy. The federal action does not involve any ground disturbance. This site was placed in Batch 2 because of the large size of the screen mesh. The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011).

22. C-2L Inc. – JB Land, LLC. Umatilla County. 45°55'24.90"N, 119°06'50.48"W. This water supply intake structure has a pipeline extending north to the south shore of the Columbia River. The AgriNorthwest owned facility is at Columbia River Mile 301.

There are four pumps (500hp each), and a 30-inch diameter pipe line with a stainless steel fish screen with a mesh size of 1/8' (3.175mm) that is cleaned annually by hand. The pipeline right-of-way crosses under the Pacific Railroad. The landowner's have held a primary water right since 1972. The water pumping plant was installed in 1994. This site has a water right for 19.34 cfs or 85,285 afy. The federal action does not involve any ground disturbance. This site was placed in Batch 2 because it is located on the south side of the Columbia River downstream of the Snake River where Snake River fall Chinook fry could be found and has screen mesh sizes greater than 3/32". The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011).

23. Royale Columbia Farms. Umatilla County. 45°55'47.50"N, 119°05'57.62"W. This water pump plant and pipeline is located between State Highway 730/395 and McNary Reservoir at Columbia River Mile 301.5 and is used to irrigate 2,115 acres south of the highway. The facility uses four pumps (three at 80 hp and one at 400 hp), and a pipeline with a stainless steel fish screen with a mesh size of 1/8" (3.175mm) and is cleaned annually by hand. The landowner has held a primary water right since 1970. The water right for this site is for 55 cfs. The water pumping plant was installed in 1994. The federal action does not include any facility alterations. This site was placed in Batch 2 because it is located on the south side of the Columbia River downstream of the Snake River where Snake River fall Chinook fry could be found and has screen mesh sizes greater than 3/32". The Corps will request that the fish screen be updated to meet current NMFS screening criteria (NMFS 2011).

1.5 Project Timeline

Easements will be renewed after all of the environmental compliance documentation and any necessary real estate actions are completed. Easements will be extended for an additional 25 year term.

2 Listed Species

2.1 Species Listed for the Project Area

The Corps reviewed the list of threatened and endangered species that pertain to the area under the jurisdiction of the NMFS and the USFWS on April 24, 2015 (Table 3) (01EWFW00-2015-SLI-0526 – WA, 01EOFW00-2015-SLI-0202-OR), and determined the proposed action would have "No Effect" on the following species: Canada lynx, gray wolf, greater sage-grouse, grizzly bear, northern wormwood, pygmy rabbit, Umtanum Desert buckwheat, Washington ground squirrel, Ute ladies'-tresses, White Bluffs bladderpod, and yellow-billed cuckoo. These species either do not occur in the project area, or will not be affected by the proposed actions. As a result, they will not be discussed in detail.

Table 3. Threatened, endangered and candidate species and designated critical habitats for Benton, Franklin and Walla Walla Counties, WA and Umatilla County, OR.

Species	Listing Status	Critical Habitat
Chinook salmon (*Oncorhynchus tshawytscha*)		
Upper Columbia River spring-run ESU	Endangered	Yes
Snake River spring/summer-run ESU	Threatened	Yes
Snake River fall-run ESU	Threatened	Yes
sockeye salmon (*O. nerka*)		
Snake River ESU	Endangered	Yes
steelhead (*O. mykiss*)		
Middle Columbia River DPS	Threatened	Yes
Upper Columbia River DPS	Threatened	Yes
Snake River Basin DPS	Threatened	Yes
bull trout (*Salvelinus confluentus*)		
Columbia River DPS	Threatened	Yes
pygmy rabbit (*Brachylagus idahoensis*)		
Columbia Basin DPS	Endangered	No
Canada lynx (*Lynx canadensis*)		
Contiguous U.S. DPS	Threatened	Not in Project Area
Gray Wolf (*Canis lupus*)		
U.S.A.: that portion of WA west of the centerline of Highway 395 south of Mesa	Endangered	No
Grizzly Bear (Ursus arctos horribilis)		
	Threatened	No
Ute ladies'-tresses (*Spiranthes diluvialis*)		
Contiguous U.S. DPS	Threatened	No
Northern Wormwood *(Artemisia campestris var. wormskioldii)*		
	Candidate	No
Greater Sage-Grouse (*Centrocercus urophasianus)*		
	Candidate	No
Yellow-billed cuckoo (*Coccyzus americanus)*		
	Threatened	Not in Project Area
Washington ground squirrel (*Urocitellus washingtoni)*		
	Candidate	No
Umtanum Desert buckwheat (*Eriogonum codium)*		
	Threatened	Not in Project Area
White Bluffs bladderpod (*Physaria douglasii ssp. tuplashensis)*		
	Threatened	Not in Project Area

2.2 Species Status

2.2.1 Upper Columbia River Spring Chinook

2.2.1.1 Listing History

UCR spring Chinook were listed as endangered under the ESA on March 24, 1999 (64 FR 14308), and their status was reaffirmed on June 28, 2005 (70 FR 37160). This evolutionarily significant unit (ESU) includes all naturally spawned populations of Chinook salmon in all river reaches accessible to Chinook salmon in Columbia River tributaries upstream of Rock Island Dam and downstream of Chief Joseph Dam in Washington, excluding the Okanogan River. The ESU also includes six artificial propagation programs: the Twisp River, Chewuch River, Methow Composite, Winthrop

National Fish Hatchery, Chiwawa River, and White River spring-run Chinook salmon hatchery programs. The Interior Columbia Basin Technical Recovery Team (ICTRT) has identified three populations in one major population group (Eastern Cascades) for this species. A historic population in the Okanogan River has been extirpated (ICTRT 2005). Spatial structure and genetic diversity of this ESU are not sufficient to support viability.

2.2.1.2 Life History/Biological Requirement

UCR spring-run Chinook salmon exhibit classic stream-type life-history strategies. For the first year of life they reside in smaller streams close to where they hatched. They emigrate from freshwater as yearling smolts in the spring and undertake extensive offshore ocean migrations. Most of these fish return to the Columbia River from March through mid-May as four-year olds. Spawning occurs in tributaries in August through September. Spring Chinook migrate between 37.4°F and 56°F (Bell 1990). Their preferred temperature is 53.6°F to 57.2°F, with an upper lethal limit of 79.2°F.

2.2.1.3 Distribution

UCR spring Chinook salmon use the Columbia River as a migration corridor. UCR spring Chinook do not occur upstream of Ice Harbor Dam.

2.2.1.4 Local Empirical Information

Most juvenile UCR spring Chinook migrate downstream through Lake Wallula from late April through early June. Most adults migrate upstream through the project area during the same timeframe and generally take four to seven days to get through Lake Wallula. Since 1960, the number of adult and jack UCR spring Chinook counted at Priest Rapids Dam has ranged from a high of 51,366 in 2001 to a low of 1,208 in 1995. In 2014, 26,391 were counted. The latest 10-year average (2005-2014) is 17,395. The previous 10-year average (1995-2004) was 15,663.

2.2.1.5 Ongoing Monitoring

There are numerous monitoring programs associated with salmon that pass through Lake Wallula. Adult salmon are counted at McNary, Priest Rapids and Ice Harbor Dams. Sample counts of juveniles are also taken to estimate the number of juveniles passing through the lake.

2.2.2 Snake River Spring/Summer Chinook

2.2.2.1 Listing History

The Snake River spring/summer Chinook salmon ESU, listed as threatened on April 22, 1992, (67 FR 14653), includes all natural-origin populations in the Tucannon, Grande Ronde, Imnaha, and Salmon Rivers. Fish returning to several of the hatchery programs

are also listed, including those returning to the Tucannon River, Imnaha, and Grande Ronde River hatcheries on the Snake River, and to the Sawtooth, Pahsimeroi, and McCall hatcheries on the Salmon River.

2.2.2.2 Life History/Biological Requirements

In the Snake River, spring and summer Chinook share key life history traits. For the first year of life they reside in smaller streams close to where they hatched. Both are stream-type fish, with juveniles that migrate swiftly to sea as yearling smolts. Depending primarily on location within the basin (and not on run-type), adults tend to return after either 2 or 3 years in the ocean. Both spawn and rear in small, high elevation streams (Chapman et al. 1995), although where the two forms co-exist, spring-run Chinook spawn earlier and at higher elevations than summer-run Chinook.

Spring/summer Chinook salmon use smaller, higher elevation tributary systems for spawning and juvenile rearing compared to fall run fish, which spawn in the main stem of larger rivers. Spring/summer Chinook salmon normally spawn in late July–September using gravel bars in smaller river and tributary streams. As with most salmon, adults die after spawning, providing a large nutrient source for juvenile fish. Juvenile spring/summer Chinook salmon behave differently than fall Chinook in that they remain in headwater streams for a year and out–migrate the following spring. Optimal water temperatures range from 59 to 64°F with temperatures exceeding 73°F being lethal (Wydoski and Whitney 2003). Juvenile Chinook salmon feed on small aquatic invertebrates in both fresh and salt water, primarily arthropods in freshwater and crustaceans in marine environments. As they grow in saltwater, they quickly change to a fish diet (IDFG 2005).

2.2.2.3 Distribution

Snake River spring/summer Chinook salmon historically spawned in the tributaries of the Clearwater, Salmon, Weiser, Payette and Boise rivers. Populations using the rivers above Hells Canyon Dam were eliminated with the construction of Hells Canyon complex from 1955 to 1967 and earlier upriver dams. Populations in the Clearwater drainage were eliminated or severely depressed by the Lewiston dam in the 1950s. Currently, Snake River spring/summer Chinook salmon utilize the Snake River drainage upstream to Hells Canyon Dam and all of the Salmon River drainage. Snake River spring/summer Chinook use the project area for migrating and rearing habitat.

2.2.2.4 Local Empirical Information

Juvenile spring Chinook salmon have been documented using the backwater areas of Lake Wallula for rearing. Although sampling has not occurred during the cooler water months in the lower Snake River, it is reasonable to assume that individuals of Snake River spring/summer Chinook salmon could use the backwater areas of lower Snake River reservoirs for periods of rearing or overwintering between July and March. Because this ESU is an upriver stock, no spawning habitat is present in the project area.

Juvenile Snake River spring/summer Chinook salmon migrate through the project area from March through July. Most adults migrate through the lower Snake River between April and mid-August. In 2014, 113,633 were counted at Ice Harbor Dam. The latest 10-year average (2005-2014) is 87,297. The previous 10-year average (1995-2004) was 66,989.

2.2.2.5 Ongoing Monitoring

Passage of adult and juvenile Chinook salmon is monitored at the Snake River dams. There are also several other monitoring programs by other federal, state and tribal organizations throughout the watershed.

2.2.3 Snake River Fall Chinook

2.2.3.1 Listing History

NMFS listed Snake River fall Chinook salmon as threatened on April 22, 1992 (57 CFR 14653) and their threatened status was reaffirmed on June 28, 2005 (70 CFR 37160).

2.2.3.2 Life History/Biological Requirements

Detailed life history data (age at spawning, sex ratios, etc.) are plentiful for hatchery populations, but limited and inconsistent for wild populations. More data are also available for some subbasins and streams than others, and different types of data are available for different streams at different times. Age at spawning and associated fecundity differ between the adults returning to the Middle Fork and main Salmon Rivers and all other areas where information is available. In these two areas, adults spending three years in the ocean (especially females) with higher fecundity predominate, whereas adults that spend only two years in the ocean have lower fecundity, and predominate in other areas. This is in spite of the fact that spring and summer Chinook salmon inhabit parts of both areas. This suggests that geography or other environmental factors are more influential in determining age at return than run-timing (Mathews and Waples 1991).

The generalized life history of Pacific salmon involves incubation, hatching, and emergence in freshwater, migration to the ocean, and subsequent initiation of maturation and return to freshwater for completion of maturation and spawning. Juvenile rearing in freshwater can be minimal or extended. Additionally, some male Chinook salmon mature in freshwater, thereby foregoing emigration to the ocean. The timing and duration of each of these stages is related to genetic and environmental determinants and their interactions to varying degrees. Salmon exhibit a high degree of variability in life history traits; however, there is considerable debate as to what degree this variability is the result of local adaptation or the general plasticity of the salmonid genome (Ricker 1972, Healey 1991, Taylor 1991).

Fall Chinook salmon in this ESU are ocean-type. Spawning, which takes place in October through November, occurs in the mainstem and in the lower parts of major tributaries, including some below the Lower Snake River dams. Juveniles emerge from the gravels in March and April of the following year, moving downstream from natal spawning and early rearing areas from June through early fall. Juvenile fall Chinook salmon move seaward slowly as subyearlings, typically within several weeks of emergence (Waples et al. 1991). Adults return to the Snake River at ages 2 through 5, with age 4 most common at spawning (Waples et al. 1991).

2.2.3.3 Distribution

Snake River fall Chinook salmon spawning and rearing occurs only in larger, mainstem rivers such as the Salmon, Snake, and Clearwater Rivers. Historically, the primary fall Chinook salmon spawning areas were located on the upper mainstem Snake River (Connor *et al*. 2005). A series of mainstem dams now blocks access to the upper Snake River and has significantly reduced spawning and rearing habitat for this species. A limited amount of spawning has been documented occurring downstream from the Snake River dams. The vast majority of spawning today occurs upstream from Lower Granite Dam, with the largest concentration of spawning sites in the Clearwater River, downstream from Lolo Creek. Currently, natural spawning is limited to the Snake River from the upper end of Lower Granite reservoir to Hells Canyon Dam, the lower reaches of the Imnaha, Grande Ronde, Clearwater, Salmon, and Tucannon Rivers, and small areas in the tailraces of the lower Snake River hydroelectric dams (Good *et al.* 2005). Adult Snake River fall Chinook salmon enter the Columbia River in July and August. Spawning occurs in the lower reaches of large tributaries in October and November. Based on what is known of upper Columbia River fall Chinook salmon, juveniles in the Snake River presumably emerge from the gravel in March and April, and downstream migration begins within several weeks of emergence (Waples et al. 1991).

2.2.3.4 Local Empirical Information

Wild juvenile fall Chinook salmon typically pass through the project area from early June through September, with double peaks in mid-July and some lingering portion of the annual migration lasting until December. Many of the juvenile fall Chinook salmon outmigrating from the Clearwater and Snake Rivers spend time in shoreline areas (less than 9.8 feet in depth) in the Lower Granite reservoir and less time in downriver reservoirs, where they prefer sand-substrate areas (Bennett et al. 1997). When water temperatures reach about 70°F, these fish appear to have achieved adequate growth and fitness due to the warming conditions of these shallow-water habitat areas. They leave the shoreline areas to either continue rearing or begin their migration in the cooler pelagic zone of the reservoirs (Bennett et al. 1997).

Though most juvenile Chinook salmon migrate to the ocean as sub-yearlings, research has shown that some juvenile fall Chinook salmon may overwinter at lower Snake River dams. Overwintering and early rearing of fall Chinook salmon in Lake Wallula

backwater areas has been documented and it would be logical to assume that the potential for overwintering and rearing exists in the lower Snake River as well.

The low velocity and relatively fine substrate along a high percentage of the reservoir shorelines of the Lower Snake River reservoirs preclude spawning in these areas. The limited spawning that does occur is in the tailrace areas below all of the lower Snake River dams, where water velocity is high and substrate size is relatively large. Surveys conducted in the tailraces of Lower Granite and Lower Monumental dams in December of 2002 and 2003 revealed no redds in the navigation channels or in areas where redds were found in the mid- to late-1990s. No redds have been located in other regions of the reservoirs, including shoreline areas that could be potentially affected by renewal of the pumping plant easements.

In 2014, 79,333 were counted at Ice Harbor Dam. The latest 10-year average (2005-2014) is 48,246. The previous 10-year average (1995-2004) was 15,739.

2.2.3.5 Ongoing Monitoring

Passage of adult and juvenile Chinook salmon is monitored at the Snake River dams. There are also several other monitoring programs by other federal, state and tribal organizations throughout the watershed.

2.2.4 Snake River Sockeye

2.2.4.1 Listing History

NMFS listed Snake River sockeye salmon as endangered on April 22, 1992 (57 FR 14653) and their endangered status was reaffirmed on June 28, 2005 (70 FR 37160) and April 14, 2014 (79 FR 20802). The Snake River sockeye salmon species includes all anadromous and residual sockeye salmon from the Snake River basin, Idaho, as well as artificially propagated sockeye salmon from the Redfish Lake captive broodstock program (NMFS 2005).

2.2.4.2 Life History/Biological Requirements

Overall age of maturity in sockeye salmon ranges from 3 to 8 years. Male sockeye salmon are capable of maturing at any of 22 different combinations of freshwater and ocean ages, while female sockeye salmon may mature at any of 14 different age compositions (Healey 1986, 1987). For a given fish size, female sockeye salmon have the highest fecundity and the smallest egg size among the Pacific salmon (Burgner 1991). Average fecundity across the range of sockeye salmon is from 2,000 to 5,200 eggs (Burgner 1991, Manzer and Miki 1985). Emerging fry possess heritable rheotactic and directional responses that allow fry from outlet tributaries to move upstream and fry from inlet tributaries to move downstream, in order to reach the nursery lake habitat (Raleigh 1967, Brannon 1972, Burgner 1991). Adult body size may also be affected by variations in stock abundance. Based on fishery catch data, which tends to select for

larger fish than are present in the total run, Columbia River sockeye salmon average about 1.58 kg after two winters at sea (Gustafson et al. 1997).

2.2.4.3 Distribution

Snake River sockeye salmon historically comprised five populations. However, four historical populations are extirpated (Alturas Lake, Pettit Lake, Yellowbelly Lake and Stanley Lake). The single extant historical population of Snake River sockeye salmon is currently restricted to Redfish Lake in the Sawtooth Valley. Currently sockeye salmon are only found in lakes in the Stanley basin of the upper Salmon River, primarily Redfish and Alturas lakes. Additionally, they migrate to and from the ocean through the Salmon, Snake and Columbia rivers.

2.2.4.4 Local Empirical Information

Snake River sockeye adults and juveniles are found in Lake Wallula at the confluence of the Snake and Columbia Rivers and in Lake Sacajawea at various times throughout the year. Juveniles typically migrate through the project area from early May through early June. Adults generally migrate through the reservoir in June and July.

The Snake River Sockeye salmon ESU currently consists of Redfish Lake stock in the captive broodstock program at Eagle and Beef Creek hatcheries, and the hatchery fish released from this program into Redfish Lake, Pettit Lake, Pettit Creek and Redfish Lake Creek; wild residual sockeye in Redfish Lake and their out-migrating progeny; any naturally-spawned progeny of broodstock adults released into Redfish Lake; and any adults returning to Redfish or Pettit Lake.

Numbers of these sockeye salmon are extremely low, but have shown a substantial increase recently. Since 1962, the highest count of adults at Ice Harbor dam was 1,302 in 2010. The latest 10-year average (2005-2014) is 771. The previous 10-year (1995-2004) average was 47.

2.2.4.5 Ongoing Monitoring

Snake River sockeye salmon are counted at the Corps' Snake River dams. Adults are counted as they move up through the ladders. Juveniles are sampled from the juvenile bypass systems and abundance estimates are made. Additional monitoring takes place in and near the lakes where sockeye spawn and rear.

2.2.5 Middle Columbia River Steelhead

2.2.5.1 Listing History

Middle Columbia River steelhead were first listed as threatened March 25, 1999 (64 FR 14517) and reaffirmed as threatened on January 5, 2006 (71 FR 834) and April 14,

2014 (79 FR 20802). Protective regulations were issued on June 28, 2005 (70 FR 37160) and critical habitat for this DPS was listed on September 5, 2005 (70 FR 52630).

2.2.5.2 Life History/Biological Requirements

Steelhead exhibit one of the most complex groups of life history traits of any species of Pacific salmonid. These fish can be anadromous (migratory) or freshwater residents (and under some circumstances, may yield offspring of the opposite form). Steelhead can spawn more than once (iteroparous), whereas most other anadromous salmonids spawn once and then die (semelparous).

Within the range of West Coast steelhead, spawning migrations occur throughout the year, with seasonal peaks of activity. Most steelhead can be categorized by one of two run types, based on sexual maturity when they re-enter freshwater and how far they go to spawn. In the Columbia River, summer steelhead enter freshwater between May and October and require several months to mature before spawning; winter steelhead enter freshwater between November and April with well developed gonads and spawn shortly thereafter. Winter steelhead are called ocean-maturing or coastal type, and summer steelhead, stream-maturing or inland type. The Middle Columbia River steelhead DPS includes the only populations of inland winter steelhead in the United States.

Steelhead spawn in clear, cool streams with suitable gravel size, depth, and current velocity. Productive steelhead habitat is characterized by complexity, primarily in the form of large and small woody structure. Steelhead may enter streams and arrive at spawning grounds weeks or even months before they spawn and are therefore vulnerable to disturbance and predation. They need cover, in the form of overhanging vegetation, undercut banks, submerged vegetation, submerged wood, floating debris, deep water, turbulence, and turbidity.

Young steelhead typically rear in streams for some time before migrating to the ocean as smolts. Steelhead smolts migrate at ages ranging from one to five years throughout the Columbia Basin, but most steelhead smolt after two years in freshwater (Busby et al. 1996). Most steelhead spend two years in the ocean before migrating back to their natal streams. Once in the river, steelhead rarely eat and grow little, if at all.

2.2.5.3 Distribution

Middle Columbia River steelhead include all naturally spawned populations of steelhead in drainages upstream of the Wind River, Washington, and the Hood River, Oregon, up to, and including, the Yakima River, Washington. Major drainages in this DPS are the Deschutes, John Day, Umatilla, Walla Walla, Yakima, and Klickitat river systems. The Cascade Mountains form the western border of the plateau in both Oregon and Washington, while the Blue Mountains form the eastern edge. The southern border is marked by the divides that separate the upper Deschutes and John Day basins from the Oregon High Desert and drainages to the south. The Wenatchee Mountains and

Palouse areas of eastern Washington border the Middle Columbia on the north (NMFS 2009).

2.2.5.4 Local Empirical Information

Middle Columbia River Basin steelhead utilize the project area for migration habitat. Very little information is documented on near-shore habitat use by juvenile steelhead in the main stem Columbia River. Juvenile steelhead are thought to utilize the deeper, higher velocity areas away from the shoreline to migrate through the reach. They could potentially use backwater areas near the proposed project during the winter and spring for rearing.

2.2.5.5 Ongoing Monitoring

Both adult and juvenile steelhead are counted as they pass mainstem dams. It is difficult to estimate the number of Middle Columbia River Basin steelhead from this data due to the various rivers that make up this DPS.

2.2.6 Upper Columbia River Steelhead

2.2.6.1 Listing History

Upper Columbia River (UCR) steelhead were listed as endangered on August 18, 1997 (62 FR 43937), and their status was upgraded to threatened on January 5, 2006 (71 FR 834). They were then reinstated as endangered per a decision in U.S. Court on June 13, 2007 (Trout Unlimited *et al.* v. Lohn, No. CV06-0483-JCC). Their status was changed to threatened per U.S. District Court order on June 18, 2009 and updated April 14, 2014 (79 FR 20802).

2.2.6.2 Life History/Biological Requirements

Life history characteristics for UCR steelhead are similar to those of other inland steelhead DPSs. However, smolt age is dominated by two- and three-year-olds and some of the oldest smolt ages for steelhead, up to seven years, are reported from this DPS. Based on limited data, steelhead from the Wenatchee and Entiat rivers return to freshwater after one year in salt water, whereas Methow River steelhead primarily return after two years in salt water. Similar to other inland Columbia River basin steelhead DPSs, adults typically return to the Columbia River between May and October and are considered summer-run steelhead. Adults may remain in fresh water up to a year before spawning. Most adult UCR steelhead quickly migrate up the mainstem to their natal tributaries. A portion of the returning run overwinters in the mainstem reservoirs, passing over the upper Mid-Columbia River dams in April and May of the following year. Unlike Chinook or sockeye salmon, steelhead adults attempt to migrate back to the ocean after spawning. These fish are known as kelts, and those that survive will migrate from the ocean to spawn again.

Steelhead adult migration preferred temperatures are between approximately 39.2 and 48.2°F (Bell 1990). Steelhead preferred temperatures fall between 50 and 55.4°F, while the upper lethal limit for steelhead is 75°F (Spence et al. 1996).

2.2.6.3 Distribution

This DPS includes all naturally spawned anadromous steelhead populations below natural and manmade impassable barriers in streams in the Columbia River Basin upstream from the Yakima River, Washington, to the U.S.-Canada border, including six artificial propagation programs: the Wenatchee River, Wells Hatchery (in the Methow and Okanogan Rivers), Winthrop Fish Hatchery, Omak Creek, and the Ringold steelhead hatchery programs. The ICTRT has identified five populations within this DPS: the Wenatchee River, Entiat River, Methow River, Okanogan Basin, and Crab Creek (ICTRT 2005). The Crab Creek anadromous component is functionally extirpated (ICTRT 2007). The major tributaries occupied by this species are the Wenatchee, Entiat, Methow, and Okanogan River systems.

2.2.6.4 Local Empirical Information

Similar to middle Columbia River steelhead, upper Columbia River steelhead use Lake Wallula for migration habitat only (NOAA 2005). Since 1960, the number of adult upper Columbia River steelhead counted at Priest Rapids Dam has ranged from a high of 40,093 in 2009 to a low of 2,462 in 1975. In 2014, 19,843 were counted. The latest 10-year average (2005-2014) is 19,420. The previous 10-year average (1995-2004) was 12,795. Wild steelhead are not differentiated from hatchery steelhead at Priest Rapids Dam.

2.2.6.5 Ongoing Monitoring

Upper Columbia River steelhead are counted at Corps' managed dams. Adults are counted as they move up through the ladders. Juveniles are sampled from the juvenile bypass systems and abundance estimates are made.

2.2.7 Snake River Basin Steelhead

2.2.7.1 Listing History

Snake River Basin steelhead were listed as threatened on August 18, 1997 (62 FR 43937) and protective regulations were issued under section 4(d) of the ESA on July 10, 2000 (65 FR 42422). Their threatened status was reaffirmed on June 28, 2005 (70 FR 37160) and April 14, 2014 (79 FR 20802).

2.2.7.2 Life History/Biological Requirements

Snake River Basin steelhead migrate a substantial distance from the ocean (up to 940 miles) and use high elevation tributaries (up to 6,562 feet above sea level) for spawning and juvenile rearing. These steelhead occupy habitat that is considerably warmer and drier (on an annual basis) than other steelhead distinct population segments. Managers classify up-river summer steelhead runs into two groups based primarily on ocean age and adult size upon return to the Columbia River. A-run steelhead are predominately age-1-ocean fish while B-run steelhead are larger, predominated by age-2-ocean fish.

Snake River Basin steelhead are generally classified as summer run, based on their adult run timing pattern. These fish enter fresh water from June to October, and after holding over the winter, spawn during the following spring from March to May. Snake River Basin steelhead usually smolt as 2- or 3-year-olds. Outmigration occurs during the spring and early summer periods, coinciding with snowmelt in the upper drainages. Hatchery steelhead trout displayed small peaks in arrival timing at Lower Granite and Little Goose Dams in mid-May to mid-June; however, the general trend at each dam was a long protracted emigration (Blenden et al. 1996).

Steelhead adult migration preferred temperatures are between approximately 39.2 and 48.2°F (Bell 1990). Steelhead preferred temperatures fall between 50 and 55.4°F, while the upper lethal limit for steelhead is 75°F (Spence et al. 1996).

2.2.7.3 Distribution

The DPS includes all naturally spawned steelhead populations below natural and manmade impassable barriers in streams in the Snake River Basin of southeast Washington, northeast Oregon, and Idaho, as well as six artificial propagation programs: the Tucannon River, Dworshak Fish Hatchery, Lolo Creek, North Fork Clearwater River, East Fork Salmon River, and the Little Sheep Creek/Imnaha River Hatchery steelhead hatchery programs.

The Interior Columbia Basin Technical Recovery Team (ICTRT 2003) identified six major population groups in the DPS: (1) The Grande Ronde River, (2) the Imnaha River, (3) the Clearwater River, (4) the Salmon River, (5) Hells Canyon, and (6) the lower Snake River. The Snake River historically supported more than 55% of total natural-origin production of steelhead in the Columbia River Basin. It now has approximately 63% of the basin's natural production potential. Environmental conditions are generally drier and warmer in these areas than in areas occupied by other steelhead species in the Pacific Northwest. Snake River Basin steelhead were blocked from portions of the upper Snake River beginning in the late 1800s and culminating with the construction of Hells Canyon Dam in the 1960s.

2.2.7.4 Local Empirical Information

Most wild adult steelhead migrate through the project area between June and August for the A-run and between late August and November for the B-run. Adults from this stock may be migrating in deeper water or individuals may be holding in mid-channel areas prior to moving upriver into tributaries for spawning in early spring.

With the exception of the Tucannon River, the tributary habitat used by Snake River Basin steelhead is above Lower Granite Dam. Returns of these steelhead fluctuated widely in the 1980s and remained at relatively low levels through the 1990s. Counts of wild steelhead, which began in 1994, show a peak in 2009 of 76,434. There were 44,365 wild steelhead counted in 2014. The latest 10 year average (2005-2014) was 42,431. The previous 10 year average (1995-2004) was 26,151.

Wild juvenile Snake River Basin steelhead generally migrate downstream through the lower Snake River between late March and the end of August. Some rearing or overwintering may occur in the project area.

2.2.7.5 Ongoing Monitoring

Passage of adult and juvenile steelhead is monitored at the Snake River dams. There are also several other monitoring programs by other federal, state and tribal organizations throughout the watershed.

2.2.8 Bull Trout

2.2.8.1 Listing History

The USFWS issued a final rule listing the Columbia River population of bull trout as threatened on June 10, 1998 (63 FR 31647), while critical habitat for this species was listed on September 30, 2010. Bull trout are currently listed throughout their range in the United States as a threatened species.

2.2.8.2 Life History/Biological Requirements

Individual bull trout may exhibit resident or migratory life history strategies. Resident bull trout carry out their entire life cycle in the stream in which they spawn and rear. Migratory bull trout spawn in tributary streams, but eventually travel to larger streams (or lakes) where they mature. Habitat components that appear to influence bull trout distribution and abundance include water temperature, cover, channel form and stability, valley form, spawning and rearing substrates and migratory corridors (with resting habitat). All life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, boulders and deep pools.
Bull trout normally reach maturity in four to seven years and may live as long as twelve years. Migratory bull trout may travel over one hundred miles to their spawning grounds. They generally spawn in stream headwaters from August to November during

periods of decreasing water temperatures. Egg incubation is normally 100 to 145 days and fry remain in the substrate for several months.

Bull trout are opportunistic feeders. Their diet requirements vary depending on their size and life history strategy. Resident and juvenile bull trout prey on insects, zooplankton and small fish. Adult migratory bull trout mainly eat other fish.

2.2.8.3 Distribution

In the Columbia River Basin, bull trout historically were found in about 60% of the basin. They now occur in less than half of their historic range. Populations remain in portions of Oregon, Washington, Idaho, Montana, and Nevada.

2.2.8.4 Local Empirical Information

The few remaining bull trout strongholds in the Columbia River Basin tend to be found in large areas of contiguous habitats in the Snake River basin of the central Idaho mountains, upper Clark Fork and Flathead Rivers in Montana, and several streams in the Blue Mountains in Washington and Oregon. Populations also exist in the Yakima River watershed. Recent studies have shown some migration between the Walla Walla River and Lake Wallula, but very little is known about the number of bull trout within the Columbia or lower Snake rivers. The number is presumed to be very low. Bull trout using Lake Wallula would be using it solely for migration or overwintering.

Anglin et al. (2010) indicate that bull trout dispersed into the mainstem Columbia River from the Walla Walla Basin, and at times this dispersal included a relatively long migration. One bull trout moved 130 river kilometers (rkm) upstream and was detected at Priest Rapids Dam, while another moved 162 rkm downstream to John Day Dam (Anglin et al. 2010). Two additional bull trout were detected returning to the Walla Walla from the Columbia River in mid-April 2010. Clearly actual abundance of bull trout in Lake Wallula is not yet known, but given the evidence, the number of migratory bull trout using the action area is extremely low.

2.2.8.5 Ongoing Monitoring

Fish passage at McNary and Ice Harbor Dams is monitored. Any bull trout observations are recorded, though only a few, if any, are generally seen in any year.

2.2.9 Pygmy Rabbit

The pygmy rabbit was listed as endangered in Washington on November 30, 2001 (66 FR 59734). Critical habitat has not been designated. Pygmy rabbits occur in the semiarid shrub steppe biome of the Columbia Basin, Great Basin, and adjacent intermountain regions of the western United States. Within this broad biome, pygmy rabbits are typically found in habitat types that include tall, dense stands of sagebrush (*Artemesia* spp.), upon which they are highly dependent for food and shelter throughout

the year. The pygmy rabbit is one of only two rabbit species in North America that digs its own burrows and therefore is most often found in areas that also include relatively deep, loose soils that allow burrowing (USFWS 2007).

There are no known pygmy rabbit populations in the project area. The pygmy rabbit's historical range includes portions of the following states: California, Oregon, Nevada, Idaho, Montana, Wyoming, Utah, and Washington[2]. In Washington, pygmy rabbits are now only known to survive in five isolated fragments of suitable habitat in Douglas County. Consequently, there will be no effect on pygmy rabbits as a result of the proposed action.

2.2.10 Canada Lynx

Canada lynx were listed as threatened in 2000. Critical habitat was designated in 2006. Lynx in the contiguous United States are at the southern margins of a widely distributed range across Canada and Alaska. The center of the North American range is in north-central Canada. Lynx occur in mesic coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare (Ruggiero et al. 2000). These forests are generally described as boreal forests. Lynx survivorship, productivity, and population dynamics are closely related to snowshoe hare density in all parts of its range. A minimum density of snowshoe hares (1.2 hares per acre) distributed across a large landscape is necessary to support survival of lynx kittens and recruitment into and maintenance of a lynx population.

Based on their necessary habitat requirements, Canada lynx do not occur in any areas that are part of this proposed action. There will be no effect on Canada lynx. In addition, there is no designated critical habitat for Canada lynx in the project area and therefore there will be no effect on Canada lynx critical habitat.

2.2.11 Gray Wolf

The gray wolf was listed as an endangered species on January 4, 1974 (39 FR 1171). Gray wolves were once common throughout most of Washington. Records exist of wolves in the vicinity of the Walla Walla Valley. Currently, wolf packs and individuals have been confirmed in the Selkirk Mountains of northeastern Washington and in the northern Cascade Mountains (WDFW 2009). Wolves have also recently been reported in southeast Washington and northeast Oregon.

On May 5, 2011, the USFWS announced they were proposing to delist the gray wolf in the Northern Rocky Mountains, in accordance with the April 15, 2011 legislation reinstating the Service's 2009 decision to delist biologically recovered gray wolf populations. In Washington, gray wolves that occur outside of the boundaries of this Distinct Population Segment remain federally listed as endangered. Wolves are classified as threatened in northeast Oregon.

[2] http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A0GG#recovery

Habitat conditions, the high level of human habitation, and a non-existent prey base in the area that is part of this proposed action make the habitat unsuitable for wolves**.** Therefore, gray wolves are not likely to occur in any areas that are part of this proposed action. There will be no effect on gray wolves.

2.2.12 Grizzly Bear

The grizzly bear was listed as threatened on July 28, 1975 (40 FR 31734). The grizzly bear was originally distributed in various habitats throughout Western North America from Central Mexico to the Arctic Ocean. Grizzly bears are now found in areas where they have a high level of topographic and vegetative diversity. Habitat loss and direct and indirect human-caused mortality is related to the decline in numbers (USFWS 1993). There is no suitable habitat for grizzly bears in the area. There will be no effect on grizzly bears.

2.2.13 Ute Ladies'-Tresses

Ute ladies'-tresses was listed as threatened in 1992 in its entire range (57 FR 2048). Critical habitat has not been designated. This plant was first discovered in Washington at Wannacut Lake in Okanogan County (also in the Okanogan watershed and ecoregion) in 1997 (Bjork 1997, as referenced in Fertig et al. 2005). In 2000, the species was also found along a reservoir bordering the Columbia River near Chelan in Chelan County (Chief Joseph watershed) within the Columbia Plateau ecoregion (Fertig et al. 2005). There are five known subpopulations of this species within Washington. The sites are in Okanogan and Chelan counties.

Since 1992, at least 26 new populations of Ute ladies'-tresses have been documented from perennial stream, river, lakeshore, and spring sites directly associated with human-developed dams, levees, reservoirs, irrigation ditches, reclaimed gravel quarries, roadside barrow pits, and irrigated meadows. In all, 33 of 61 documented populations (54%) occur in sites in which natural hydrology has been influenced by dams, reservoirs, or supplemental irrigation. Even some sites with undisturbed hydrology have been influenced by human agricultural practices, urban development, or road and dam construction (Fertig et al. 2005).

Based on the limited disturbance of the proposed action and the lack of any known records of this plant along the Columbia and Snake rivers, the Corps has determined the proposed action will have no effect on any individual plants of this species.

2.2.14 White Bluffs Bladderpod

White Bluffs bladderpod was first listed as threatened on May 15, 2012 (77 FR 28704). This listing was reaffirmed on December 20, 2013 (78 FR 76995). This species is a low growing, herbaceous, perennial plant with a sturdy tap root and a dense rosette of broad gray-green pubescent (having any kind of hairs) leaves. The plant produces

showy yellow flowers on relatively short stems in May, June, and July. Individuals of this species reach reproductive condition in their first or second year, most adult plants flower every year, and the lifespan of the species is probably 4 to 5 years. The population size appears to vary from year to year, and the survival of seedlings and adults appears to be highly variable (Dunwiddie *et al.* 2002). Monitoring suggests the annual population fluctuations are presumably tied to environmental conditions, such as seasonal precipitation and temperature.

White Bluffs bladderpod is found only on the Hanford Reach of the Columbia River within semiarid shrub steppe habitats of the Columbia Plateau in south-central Washington. As a result, the proposed action will have no effect on any individuals of this species.

2.2.15 Yellow-Billed Cuckoo

Yellow-billed cuckoo in the western portion of North America, were listed as threatened on October 3, 2014 (79 FR 59991). Critical habitat has been proposed, though Washington is not included in the designation (79 FR 48547). This bird prefers open woodlands with clearings and a dense shrub layer. They are often found in woodlands near streams, rivers, or lakes, but yellow-billed cuckoos occur most frequently and consistently in cottonwood (*Populus spp.)* forests with thick understory (Talyor 2000). In North America, their preferred habitats include abandoned farmland, old fruit orchards, successional shrubland, and dense thickets. In winter, yellow-billed cuckoos can be found in tropical habitats with similar structure, such as scrub forest and mangroves. Individuals may be on breeding grounds between May and August.

In the Pacific Northwest, the species was formerly common in willow bottoms along Willamette and Columbia Rivers in Oregon, and in the Puget Sound lowlands and along the lower Columbia River in Washington. The species was rare east of the Cascade Mountains in these States. It may now be extirpated from Washington (USFWS 2008).

There are no known occurrences of yellow-billed cuckoo in any of the areas that are part of this proposed action. Therefore, the proposed action will have no effect on any individuals of this species or its proposed habitat.

2.2.16 Umtanum Desert Buckwheat

Umtanum Desert buckwheat was first listed as threatened effective May 25, 2012 (77 FR 28704). This listing was reaffirmed on December 20, 3013 (78 FR 76995). This plant is a long-lived, woody perennial plant that forms low mats. Individual plants may exceed 100 years of age. Leaves are covered with dense white hairs and flowers are yellow. The only known population of Umtanum Desert buckwheat occurs along the top edges of the steep slopes on Umtanum Ridge, a wide mountain ridge in Benton County, Washington, where it has a discontinuous distribution along a narrow portion of the ridge.

Studies indicate that threats to Umtanum Desert buckwheat and its habitat are primarily due to wildfire and associated firefighting activities (Dunwiddie *et al.* 2001, reported in USFWS 2012). The invasion of nonnative plants that increase the availability of wildfire fuel sources is also a threat. Livestock trespassing, prospecting, and off-road vehicle use also represent potential threats, which appear to be presently reduced because of improved boundary integrity, access controls, fencing, and enforcement.

There are no known populations of Umtanum Desert buckwheat in the project area. The project area is confined to the shores of the Columbia, Snake, and Yakima rivers. Consequently, the proposed action will have no effect on any individuals of this species.

2.2.17 Washington Ground Squirrel

The Washington ground squirrel is listed as a candidate species. It spends much of its time underground. Adults emerge from hibernation between January and early March, depending on elevation and microhabitat conditions, with males emerging before females. Their active time is spent in reproduction and fattening for their six-month or longer dormancy. Adults return to their burrows by late May to early June, and juveniles return about a month later. Washington ground squirrels produce only one litter of young per year due to their limited period of activity and reproduction.

Washington ground squirrels occur in dry grassland or in patches of grass and other herbaceous plants within low open sagebrush. They prefer deep, loose soil, which they need for digging burrows. The greater part of its current range is uncultivated steppe in Walla Walla, Franklin, Adams, Lincoln, and Grant Counties.

The proposed action is confined to areas along the shores of the Columbia and Snake rivers. Therefore, this action will have no effect on any individuals of this species.

2.2.18 Greater Sage-Grouse

The greater sage-grouse is listed as a candidate species. It is the largest North American grouse species. Adult male greater sage-grouse range in length from 26 to 30 inches and weigh between 4 and 7 pounds. Adult females are smaller, ranging in length from 19 to 23 inches and weighing between 2 and 4 pounds.

Sage-grouse require large areas of contiguous sagebrush. Greater sage-grouse depend on a variety of shrub-steppe habitats throughout their life cycle, and are considered obligate users of several species of sagebrush. Sage-grouse exhibit strong site fidelity to seasonal habitats, which includes breeding, nesting, brood rearing, and wintering areas. Adult sage-grouse rarely switch between these habitats once they have been selected, limiting their adaptability to changes and movement into unfamiliar areas or restored habitats.

Historically, greater sage-grouse occurred in 13 States and 3 Canadian provinces—Washington, Oregon, California, Nevada, Idaho, Montana, Wyoming, Colorado, Utah,

South Dakota, North Dakota, Nebraska, British Columbia, Alberta, and Saskatchewan. Currently, greater sage-grouse occur in 11 States (Washington, Oregon, California, Nevada, Idaho, Montana, Wyoming, Colorado, Utah, South Dakota, and North Dakota), and 2 Canadian provinces (Alberta and Saskatchewan), occupying approximately 56 percent of their historical range.

Current populations of greater sage-grouse are known in Grant, Douglas, Yakima, and Kittitas counties. There are no known populations of greater sage-grouse in the project area. Consequently, the proposed action will have no effect any individuals of this species.

2.2.19 Northern Wormwood

Northern wormwood became a candidate for federal listing in October 1999 and is a perennial plant in the aster family (Asteraceae). It is generally a low-growing plant, 15 to 30 centimeters tall, but may grow up to 40 centimeters in height. It has a taproot and basal leaves crowded in rosettes. The basal leaves are 2 to 10 cm (1 to 4 in) long and divided two or three times in mostly linear divisions. Leaves on the upper stems are similar, but smaller and less divided. The stems and leaves are conspicuously covered with silky hairs, while the fruits (achenes) and the enlarged upper ends of the flower-bearing stalks (receptacles) are without hairs. Northern wormwood is the only variety of Artemisia that flowers in April and May.

Historically, northern wormwood was collected along the banks of the Columbia River near the mouth of the John Day River in Wasco County, Oregon to the vicinity of Hood River in Hood River County, Oregon. These sites have been resurveyed for this species, and no populations were found. It is likely that disturbances due to the construction of several dams and subsequent flooding of habitat resulted in the extirpation of historical occurrences.

Currently, this plant is known from only two sites along the Columbia River, in Klickitat and Grant Counties, Washington. These two populations were discovered in 1983. In 1989, at the Klickitat County site, 75 plants occupied less than 1 acre. In 1995 and in 1999 less than 145 flowering plants were documented on each survey. More recently, between 2002 and 2007 this species declined from 100 plants to 36 plants. Data from 2001 through 2006 indicate a steady decline in the Grant County population as well.

There are no known local populations of northern wormwood in the project area. Consequently, the proposed action will have no effect on any member of this species.

2.3. Status of Critical Habitat

Designated critical habitat for anadromous species focuses on certain habitat features called “primary constituent elements” (PCEs) that are essential to support one or more of the life stages of salmonids. The PCEs for listed salmon and steelhead in the project area are broken into two groups based on life history requirements. PCEs for Snake

River steelhead, Upper Columbia River spring Chinook, Upper Columbia River steelhead, and Middle Columbia River steelhead are shown in table 4, while effects to PCEs for Snake River spring/summer Chinook, Snake River fall Chinook, and Snake River sockeye are shown in table 5.

2.3.1 Snake River Steelhead

Critical habitat for Snake River steelhead includes Hells Canyon, Imnaha River, Lower Snake/Asotin, Upper Grande Ronde, Wallowa River, Lower Grande Ronde, Lower Snake/Tucannon, Upper Salmon, Pahsimeroi, Middle Salmon-Panther, Lemhi, Upper Middle Fork Salmon, Lower Middle Fork Salmon, Middle Salmon-Chamberlain, South Fork Salmon, Lower Salmon, Little Salmon, Upper Selway, Lower Selway, Lochsa, Middle Fork Clearwater, South Fork Clearwater, and Clearwater subbasins, and the Lower Snake/Columbia River migration corridor (NMFS 2005). Of the 8,225 miles of habitat eligible for designation, 8,049 miles of stream and 4 square miles of lake are designated.

Table 4. PCEs of critical habitats designated for Snake River steelhead, Upper Columbia River spring Chinook, Upper Columbia River steelhead, and Middle Columbia River steelhead, and corresponding species life history events.

Primary Constituent Elements		Species Life History Event
Site Type	**Site Attribute**	
Freshwater spawning	Substrate Water quality Water quantity	Adult spawning Embryo incubation Alevin development
Freshwater rearing	Floodplain connectivity Forage Natural cover Water quality Water quantity	Fry emergence Fry/parr growth and development
Freshwater migration	Free of artificial obstructions Natural cover Water quality Water quantity	Adult sexual maturation Adult upstream migration, holding Kelt (steelhead) seaward migration Fry/parr seaward migration
Estuarine areas	Forage Free of obstruction Natural cover Salinity Water quality Water quantity	Adult sexual maturation Adult “reverse smoltification” Adult upstream migration, holding Kelt (steelhead) seaward migration Fry/parr seaward migration Fry/parr smoltification Smolt growth and development Smolt seaward migration
Nearshore marine areas	Forage Free of obstruction Natural cover Water quantity Water quality	Adult sexual maturation Smolt/adult transition
Offshore marine areas	Forage Water quality	Adult growth and development

2.3.2 Upper Columbia River Spring Chinook

Critical habitat for upper Columbia River spring Chinook includes all streams and rivers in the upper Columbia River basin, including the following subbasins: Chief Joseph, Methow, Upper Columbia/Entiat, Wenatchee, and the Columbia River Corridor. Critical habitat borders on or passes through the following counties in Oregon: Clatsop, Columbia, Gillium, Hood River, Morrow, Multnomah, Sherman, Umatilla, and Wasco; and the following counties in Washington: Benton, Chelan, Clark, Cowlitz, Douglas, Franklin, Grant, Kittitas, Klickitat, Okanogan, Pacific, Skamania, Wahkiakum, Walla Walla, and Yakima.

Table 5. PCEs of critical habitats designated for Snake River spring/summer Chinook, Snake River fall Chinook, and Snake River sockeye, and parallel life history events.

Primary Constituent Elements		Species Life History Event
Site	**Site Attribute**	
Spawning and juvenile rearing areas	Access (sockeye) Cover/shelter Food (juvenile rearing) Riparian vegetation Space (Chinook) Spawning gravel Water quality Water temperature (sockeye) Water quantity	Adult spawning Embryo incubation Alevin development Fry emergence Fry/parr growth and development Fry/parr smoltification Smolt growth and development
Juvenile migration corridors	Cover/shelter Food Riparian vegetation Safe passage Space Substrate Water quality Water quantity Water temperature Water velocity	Fry/parr seaward migration Smolt growth and development Smolt seaward migration
Areas for growth and development to adulthood	Ocean areas – not identified	Adult growth and development Adult sexual maturation Fry/parr smoltification Smolt/adult transition
Adult migration corridors	Cover/shelter Riparian vegetation Safe passage Space Substrate Water quality Water quantity Water temperature Water velocity	Adult sexual maturation Adult “reverse smoltification” Adult upstream migration

2.3.3 Upper Columbia River Steelhead

Critical habitat for upper Columbia River steelhead includes streams, rivers and lakes in the upper Columbia River basin, including the following subbasins: Chief Joseph, Okanogan, Similkameen, Methow, Upper Columbia/Entiat, Wenatchee, Lower Crab, Upper Columbia/Priest, and the Columbia River Corridor. Critical habitat borders on or passes through the following counties in Oregon: Clatsop, Columbia, Gilliam, Hood River, Morrow, Multnomah, Umatilla, and Wasco; and the following counties in Washington: Adams, Benton, Chelan, Clark, Cowlitz, Douglas, Franklin, Grant, Kittitas, Klickitat, Okanogan, Pacific, Skamania, Wahkiakum, Walla Walla, and Yakima.

2.3.4 Middle Columbia River Steelhead

Critical habitat for middle Columbia River steelhead includes streams, rivers and lakes in the middle Columbia River basin, including the following subbasins: Upper Yakima, Naches, Lower Yakima, Middle Columbia/Lake Wallula, Walla Walla, Umatilla, Middle Columbia/Hood, Klickitat, Upper John Day, North Fork John Day, Middle Fork John Day, Lower John Day, Lower Deschutes, Trout, Upper Columbia/Priest Rapids and the Columbia River corridor. Critical habitat borders on or passes through counties in Oregon: Clatsop, Columbia, Crook, Gilliam, Grant, Hood River, Jefferson, Morrow, Multnomah, Sherman, Umatilla, Union, Wallowa, Wasco, and Wheeler; and counties in Washington: Benton, Clark, Cowlitz, Columbia, Franklin, King, Kittitas, Klickitat, Lewis, Pacific, Pierce, Skamania, Wahkiakum, Walla Walla, and Yakima.

2.3.5 Snake River Spring/Summer Chinook

Critical habitat for Snake River spring/summer Chinook includes the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to the confluence of the Columbia and Snake Rivers and all Snake River reaches from the confluence of the Columbia River upstream to Hells Canyon Dam.

Critical habitat also includes river reaches presently or historically accessible (except reaches above impassable natural falls, and Dworshak and Hells Canyon Dams) to Snake River spring/summer Chinook salmon in the following hydrologic units: Hells Canyon, Imnaha, Lemhi, Little Salmon, Lower Grande Ronde, Lower Middle Fork Salmon, Lower Salmon, Lower Snake-Asotin, Lower Snake-Tucannon, Middle Salmon-Chamberlain, Middle Salmon-Panther, Pahsimeroi, South Fork Salmon, Upper Middle Fork Salmon, Upper Grande Ronde, Upper Salmon, Wallowa. Critical habitat borders on or passes through counties in Oregon: Baker, Clatsop, Columbia, Gillium, Hood River, Morrow, Multnomah, Sherman, Umatilla, Union, Wallowa, Wasco; the following counties in Washington: Asotin, Benton, Clark, Columbia, Cowlitz, Franklin, Garfield, Klickitat, Pacific, Skamania, Wahkiakum, Walla Walla, Whitman; and the following counties in Idaho: Adams, Blaine, Custer, Idaho, Lemhi, Lewis, Nez Perce, Valley.

2.3.6 Snake River Fall Chinook

Critical habitat for Snake River fall Chinook includes the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to the confluence of the Columbia and Snake Rivers and all Snake River reaches from the confluence of the Columbia River, upstream to Hells Canyon Dam; the Palouse River from its confluence with the Snake River upstream to Palouse Falls; the Clearwater River from its confluence with the Snake River upstream to its confluence with Lolo Creek; the North Fork Clearwater River from its confluence with the Clearwater River upstream to Dworshak Dam.

Critical habitat also includes river reaches presently or historically accessible (except reaches above impassable natural falls, and Dworshak and Hells Canyon Dams) to Snake River fall Chinook salmon in the following hydrologic units; Clearwater, Hells Canyon, Imnaha, Lower Grande Ronde, Lower North Fork Clearwater, Lower Salmon, Lower Snake, Lower Snake-Asotin, Lower Snake-Tucannon, and Palouse. Critical habitat borders on or passes through the following counties in Oregon: Baker, Clatsop, Columbia, Gillium, Hood River, Morrow, Multnomah, Sherman, Umatilla, Wallowa, Wasco; the following counties in Washington: Adams, Asotin, Benton, Clark, Columbia, Cowlitz, Franklin, Garfield, Klickitat, Lincoln, Pacific, Skamania, Spokane, Wahkiakum, Walla Walla, Whitman; and the following counties in Idaho: Adams, Benewah, Clearwater, Idaho, Latah, Lewis, Nez Perce, Shoshone, Valley.

2.3.7 Snake River Sockeye

Critical habitat for Snake River sockeye includes the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) and including all Columbia River estuarine areas and river reaches upstream to the confluence of the Columbia and Snake Rivers and all Snake River reaches from the Columbia River upstream to the confluence of the Salmon River; all Salmon River reaches from the confluence of the Snake River upstream to Alturas Lake Creek; Stanley, Redfish, Yellow Belly, Pettit, and Alturas Lakes (including their inlet and outlet creeks); Alturas Lake Creek, and that portion of Valley Creek between Stanley Lake Creek and the Salmon River.

Critical habitat is comprised of all river lakes and reaches presently or historically accessible (except reaches above impassable natural falls, and Dworshak and Hells Canyon Dams) to Snake River sockeye salmon in the following hydrologic units: Lower Salmon, Lower Snake, Lower Snake-Asotin, Lower Snake-Tucannon, Middle Salmon-Chamberlain, Middle Salmon-Panther, and Upper Salmon. Critical habitat borders on or passes through the following counties in Oregon: Clatsop, Columbia, Gillium, Hood River, Morrow, Multnomah, Sherman, Umatilla, Wallowa, Wasco; the following counties in Washington: Asotin, Benton, Clark, Columbia, Cowlitz, Franklin, Garfield, Klickitat, Pacific, Skamania, Wahkiakum, Walla Walla, Whitman; and the following counties in Idaho: Blaine, Custer, Idaho, Lemhi, Lewis, Nez Perce.

2.3.8 Bull Trout

Bull trout critical habitat was designated in 2005. The USFWS revised the designation in 2010. A final rule was published on October 18, 2010, and took effect on November 17, 2010. A total of 19,729 miles of stream and 488,251 acres of reservoirs and lakes are designated as bull trout critical habitat. The Snake, Columbia, Yakima, and Walla Walla Rivers, which encompass the project area, are designated as bull trout critical habitat. PCEs for bull trout critical habitat are listed in table 6.

Table 6. Primary constituent elements (PCEs) of critical habitats designated for bull trout.

PCEs		
1	Water Quality	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporehic flows) to contribute to water quality and quantity and provide thermal refugia.
2	Migration Habitat	Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.
3	Food Availability	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.
4	Instream Habitat	Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these environments, with features such as large wood, side channels, pools, undercut banks and clean substrates, to provide a variety of depths, gradients, velocities, and structure.
5	Water Temperature	Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.
6	Substrate Characteristics	In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.
7	Stream Flow	A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.
8	Water Quantity	Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.
9	Nonnative Species	Sufficiently low levels of occurrence of nonnnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

3 Effects of the Action

This section includes an analysis of general project-related effects of the proposed action, as well as specific effects on the species and critical habitat PCEs. Potential effects from any interrelated, interdependent and cumulative (e.g., water withdrawals) activities are also discussed.

3.1 Effects on Listed Species

The Corps anticipates that project-related effects will be similar for all listed salmonids in the area of impact. Consequently these effects will be analyzed collectively. Effects from the pump screens which are larger than 3/32” would be on just Snake River fall Chinook (fry).

The Corps concludes these actions will have “No Effect” on pygmy rabbit, Canada lynx, gray wolf, grizzly bear, Ute ladies’-tresses, White Bluffs bladderpod, Umtanum Desert buckwheat, yellow-billed cuckoo, Washington ground squirrel, northern wormwood, or greater sage-grouse.

3.1.1 Screen Mesh Size

Screen mesh size larger than 3/32” could have an effect on Snake River fall Chinook fry. Screens with material larger openings could entrain small fish and trap them against the screen leading to mortality. These fry would originate from salmon that spawned in the mainstem Snake River below Ice Harbor or Lower Monumental dams. Pump plant owners having screens with openings larger than 3/32” will be required to replace their screen material to meet current fish screening criteria (NMFS 2011). The Corps proposes to require irrigators with non-compliant screens to replace their screens to meet current NMFS criteria by the end of 2020.

3.1.2 In-Water Work to Replace Screens

In-water work to replace screens is an interrelated effect associated with the inadequate screen material. Screens which can be handled by hand can be replaced at any time of the year. Larger screens which require the use of heavy equipment or divers will only occur between December 15 and February 28 or August 1 to August 31.

3.1.3 Screen/Intake Maintenance

Periodic maintenance to the intake screens will occur. The most frequent maintenance will be cleaning the exterior of the screens of any debris and algae. Screen cleaning will occur annually at a minimum, or as often as needed to maintain adequate flow. Clean screens will reduce approach velocity and reduce the risk of entrainment of fall Chinook fry. With the size and type differences of the various screens, maintenance will vary from brushing off the screen by hand, temporarily removing the screen to clean it, or with divers using a high pressure washer to remove accumulated material from the screen.

3.2 Effects on Critical Habitat

The PCEs for listed salmon and steelhead in the project area are broken into two groups based on similar life history requirements. Effect determinations to critical habitat PCEs for Snake River steelhead, Upper Columbia River spring Chinook, Upper Columbia River steelhead, and Middle Columbia River steelhead are shown in table 7, while effect determinations to PCEs for Snake River spring/summer Chinook, Snake River fall Chinook, and Snake River sockeye are shown in table 8.

Because the proposed action occurs near inland freshwater habitats it does not impact some of the PCEs for listed species. Specifically, estuarine areas, nearshore marine

areas, and offshore marine areas in table 4 and ocean areas for salmon growth and development in table 5 are not within the project area. Only those PCEs that may be affected will be discussed further.

3.2.1 Salmon and Steelhead

Juvenile spring/summer and fall Snake River Chinook salmon, and upper and middle Columbia River steelhead have been documented using backwater areas of Lake Wallula for rearing and/or overwintering. At the same time, both the spring/summer and a portion of the fall Snake River Chinook are thought to overwinter in lower Snake River reservoirs and migrate to the ocean as yearlings rather than sub-yearlings.

Table 7. Effect determinations for the proposed action to PCEs of critical habitats for Snake River steelhead, Upper Columbia River spring Chinook, Upper Columbia River steelhead, and Middle Columbia River steelhead, and corresponding species life history events.

Primary Constituent Elements		Effects of Proposed Action	
Site Type	**Site Attribute**	**Batch 1**	**Batch 2**
Freshwater spawning	Substrate	No Effect	No Effect
	Water quality	No Effect	No Effect
	Water quantity	No Effect	No Effect
Freshwater rearing	Floodplain connectivity	No Effect	No Effect
	Forage	No Effect	No Effect
	Natural cover	No Effect	No Effect
	Water quality	NLAA	NLAA
	Water quantity	No Effect *	No Effect *
Freshwater migration	Free of artificial obstructions	No Effect	No Effect
	Natural cover	No Effect	No Effect
	Water quality	NLAA	NLAA
	Water quantity	No Effect *	No Effect *
Estuarine areas	Forage Free of obstruction Natural cover Salinity Water quality Water quantity	No Effect	No Effect
Nearshore marine areas	Forage Free of obstruction Natural cover Water quantity Water quality	No Effect	No Effect
Offshore marine areas	Forage Water quality	No Effect	No Effect

* Water quantity will be reduced by a minor amount by the pumping plants. However, the Corps has no discretion on water rights or how water withdrawn from the river is used. Water quantity is therefore not being considered as an effect that can be avoided or reduced.

For both Batches 1 and 2, there will be disturbance during installation, inspection, and cleaning of the intakes and screens that will have a temporary, minor effect on water quality. Turbidity levels in the immediate areas surrounding the screens will increase temporarily. However, the disturbance caused by the actions will likely cause any salmonids in the area to relocate to adjacent habitat which is unaffected. Effects from water quality changes will be insignificant and are not likely to adversely affect designated critical habitat for ESA-listed fish species. Effects to rearing and migration habitat from the proposed action are expected to be insignificant and are not likely to adversely affect salmon and steelhead critical habitat.

Table 8. Effect determinations for the proposed action to PCEs of critical habitats for Snake River spring/summer Chinook, Snake River fall Chinook, and Snake River sockeye, and corresponding species life history events.

Primary Constituent Elements		Effect Determinations of Proposed Action	
Site	**Site Attribute**	**Batch 1**	**Batch 2**
Spawning and juvenile rearing areas	Access (sockeye)	No Effect	No Effect
	Cover/shelter	No Effect	No Effect
	Food (juvenile rearing)	No Effect	No Effect
	Riparian vegetation	No Effect	No Effect
	Space (Chinook)	No Effect	No Effect
	Spawning gravel	No Effect	No Effect
	Water quality	NLAA	NLAA
	Water temperature (sockeye)	No Effect	No Effect
	Water quantity	No Effect *	No Effect *
Juvenile migration corridors	Cover/shelter	No Effect	No Effect
	Food	No Effect	No Effect
	Riparian vegetation	No Effect	No Effect
	Safe passage	NLAA	**LAA**
	Space	No Effect	No Effect
	Substrate	No Effect	No Effect
	Water quality	NLAA	NLAA
	Water quantity	No Effect *	No Effect *
	Water temperature	No Effect	No Effect
	Water velocity	No Effect	No Effect
Areas for growth and development	Ocean areas	No Effect	No Effect
Adult migration corridors	Cover/shelter	No Effect	No Effect
	Riparian vegetation	No Effect	No Effect
	Safe passage	No Effect	No Effect
	Space	No Effect	No Effect
	Substrate	No Effect	No Effect
	Water quality	NLAA	NLAA
	Water quantity	No Effect *	No Effect *
	Water temperature	No Effect	No Effect
	Water velocity	No Effect	No Effect

* Water quantity will be reduced by a minor amount by the pumping plants. However, the Corps has no discretion on water rights or how water withdrawn from the river is used. Water quantity is therefore not being considered as an effect that can be avoided or reduced.

3.2.2 Bull Trout

Effects to PCEs for bull trout are discussed below. Because the proposed action is not expected to have effects on instream habitat, water temperature, substrate characteristics, stream flow, and non-native species they will not be discussed further (Table 9).

Water quality: There will be disturbance during installation, inspection, and cleaning of the intakes and screens that will have a temporary, minor effect on water quality. Turbidity levels in the immediate areas surrounding the screens will increase temporarily. However, the disturbance caused by the actions will likely cause any salmonids in the area to relocate to adjacent habitat which is unaffected. Effects from water quality changes will be insignificant and are not likely to adversely affect designated critical habitat for ESA-listed fish species.

Migration corridors: ***No effect.***

Table 9. Effects determinations for the proposed action to the PCEs of critical habitats designated for bull trout.

PCEs		
1	Water Quality	NLAA
2	Migration Habitat	No Effect
3	Food Availability	No Effect
4	Instream Habitat	No Effect
5	Water Temperature	No Effect
6	Substrate Characteristics	No Effect
7	Stream Flow	No Effect
8	Water Quantity	No Effect *
9	Nonnative Species	No Effect

* Water quantity will be reduced by a minor amount by the pumping plants. However, the Corps has no discretion on water rights or how water withdrawn from the river is used. Water quantity is therefore not being considered as an effect that can be avoided or reduced.

Food availability: ***No effect.***

Instream habitat: ***No effect.***

Water temperature: ***No effect.***

Substrate characteristics: ***No effect.***

Stream flow: ***No effect.***

Water quantity: ***The Corps has no discretion on water rights or how water withdrawn from the river is used. Effects to water quantity are not being considered as an effect that can be avoided or reduced.***

Nonnative species: ***No effect.***

3.3 Cumulative Effects

Cumulative effects are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act. These types of actions are discussed in this section because they could have effects on ESA-listed species which will occur in the future. The main focus discussed in this section is other water withdrawal actions. There are other ongoing actions discussed in NMFS 2008 (as referenced in NMFS 2014) which will not be repeated here.

Water withdrawn from existing diversion/intake points are part of the environmental baseline, but their continued use in the future will have cumulative effects. There has not been a formal adjudication process for the Columbia River Basin, so a precise measurement of water withdrawn, whether by legal certificate or illegally, is not possible. It is unclear exactly how much water is withdrawn from, or discharged to, the Columbia River in the action area.

In 2006, Washington enacted legislation creating the Columbia River Basin Development Account to support new water supplies for both instream and out-of-stream uses. Under that account, Ecology's Office of the Columbia River (OCR) is actively investigating an array of new water developments that total about 6 million acre-feet. While the state of Washington is investigating several new storage projects, the state estimates it needs about 1 million acre-feet in new water storage to meet demands through 2030. Newly developed storage under this program is to be apportioned between instream and out-of-stream uses (1/3 of new storage for improving stream flows to benefit fish and 2/3 of new storage for new out-of-stream uses). It is unknown if any Federal assistance (likely from the Bureau of Reclamation) will be needed to complete such projects.

There are irrigation networks in Kennewick operated by the Columbia Irrigation District (CID) and the Kennewick Irrigation District (KID). Each deliver untreated Yakima River water through open and closed gravity-flow conduits to agricultural and residential customers. The cities of Richland (south) and Kennewick basically have a small river flowing through them. KID flows around 150 million gallons per day (MGD) (240 cfs) of water through the cities from April 1st to October 31st.

Franklin County Irrigation District No. 1 (FCID) was formed in 1919 to supply irrigation water to homes and farms in a rural section of Franklin County, west of Pasco. This facility operates with a 125 horsepower (hp) pump, a 300 hp pump, and a 450 hp pump depending on demand. The FCID withdraws about 18,300 acre-feet (25.3 cfs), from the Columbia River for irrigation purposes. They also withdraw from wells in the area.

FCID has permits or certificates for about 30,000 ac-ft as per FCID (FCID personnel communication 10/10/13.)

There are approximately 40 private water systems in the area drawing from both wells and the river. The majority of these systems serve small commercial businesses and trailer parks in areas that were not served with city water when they were developed. It is expected that these systems will eventually connect to the city water utility as their infrastructure reaches the end of its design life, or as a city system expands into their area. Connection of existing water systems to the city water utility may require transfer of the owner's water right to the city if the owner's intent is to relinquish all use of an existing water source (CH2M Hill, 2010).

Some new water projects are likely to be pursued, but most water developments incur Federal permitting obligations, such as Corps CWA Section 404 permits, and would be subject to future consultations. We are not aware of any specific plans for additional water developments in the action area that qualify as cumulative effects and are "reasonably certain to occur".

Reduced river flow will have a seasonal minor effect on the ESA-listed salmonids. Water use is regulated by the states. The Corps has no discretion on water rights or how water withdrawn from the river is used and is therefore not being considered as an effect that can be avoided or reduced in this consultation.

Total withdrawal from all of the withdrawal locations on the Snake River add up to less than 200 cfs[3]. The minimum Snake River discharge is 2,700 cfs[4] which could occur in extremely dry years. The irrigation withdraw could be as high as 7.4% of the total river flow.

All of the withdrawal locations on the Columbia River add up to less than 500 cfs[2]. The average minimum flow of the Columbia River is 80,440 cfs. The irrigation withdraw could be as high as 0.62% of the total river flow. The required minimum flow of the Columbia River required by the Washington Department of Ecology is 50,000 cfs (70,000 cfs May 1 to June 15).

Major effects to listed resources near the action area are primarily the result of urban development, agriculture, and associated water diversion and water control activities. The proposed action occurs near or within the largest metropolitan center of southeastern Washington. Benton and Franklin Counties have combined population of over 270,000 people (USCB 2014) and development is projected to continue into the foreseeable future. Additional effects to the mainstem of the Columbia and Snake Rivers would result from the heavy recreational and commercial use of the area. Recreation in the area includes fishing, hunting, boating, bird watching, and swimming, while commercial activities are dominated by year round barge traffic.

[3] Actual value may be slightly different. Convert-to.com was used to standardize units.
[4] Data obtained from www.fpc.org, Flow and Spill Data.

Future actions that may contribute to cumulative effects would include additional development along the Yakima, Columbia and Snake Rivers. Increased impervious surfaces could add to runoff that may contribute additional oils, pesticides, fertilizers, and hazardous wastes to fish bearing waters. Snake and Columbia River reservoirs will continue to fluctuate based on available water and annual or emergency repairs/maintenance at the mainstem dams. These activities are reasonably certain to continue.

The municipal and irrigation water withdrawals discussed above have a small impact the river environment. The approximate total withdrawal amount from each of the cities and the major irrigation suppliers is 577 cfs (415 MGD). The Ecology website shows a total diversionary withdrawal amount of 5,708 (3,689 MGD) which is 11.4 % of the minimum required instream flow. It is 7.1% of the minimum average daily flow. These relatively small diversions could have some impact on migrating salmonids, but the effects would be minimal. Ecology is in the process of trying to find even more water which could be used for beneficial uses, both instream and out of stream.

The effects of the proposed action, when combined with effects of past actions and potential effects of reasonably certain future actions, are not expected to result in any significant or permanent adverse effects to listed fish species or designated critical habitat.

3.4 Effects Determinations

3.4.1 Listed Species

The Corps determined that the proposed action may affect, and is likely to adversely affect Snake River fall Chinook salmon. Our determination for Snake River spring/summer Chinook, Snake River sockeye, Snake River steelhead, Upper Columbia River spring Chinook, Upper Columbia River steelhead, Middle Columbia River steelhead, and bull trout is “may affect, not likely to adversely affect”. The project would have no effect on pygmy rabbit, Canada lynx, gray wolf, Ute ladies’-tresses, northern wormwood, greater sage-grouse, yellow-billed cuckoo, Washington ground squirrel, Umtanum Desert buckwheat, and White Bluffs bladderpod.

Effects of the proposed action may include injury or mortality to Snake River fall Chinook fry from pump intakes sites with screen mesh sizes greater than 3/32”. See Table 10 for a summary of the Corps effect determinations.

Table 10. Effect determinations for listed species that may occur in the project area.

Species	Batch 1 Determination	Batch 2 Determination
NMFS		
Snake River Spring/Summer Chinook	NLAA	NLAA
Snake River Fall Chinook	NLAA	**LAA**
Upper Columbia River Spring Chinook	NLAA	NLAA
Snake River Sockeye	NLAA	NLAA
Snake River Steelhead	NLAA	NLAA
Upper Columbia River Steelhead	NLAA	NLAA
Middle Columbia River Steelhead	NLAA	NLAA
USFWS		
Bull trout	NLAA	NLAA
Pygmy Rabbit	No Effect	No Effect
Canada lynx	No Effect	No Effect
Gray Wolf	No Effect	No Effect
Grizzly Bear	No Effect	No Effect
Ute ladies'-tresses	No Effect	No Effect
Northern Wormwood	No Effect	No Effect
Greater Sage-Grouse	No Effect	No Effect
Yellow-Billed Cuckoo	No Effect	No Effect
Washington Ground Squirrel	No Effect	No Effect
Umtanum Desert Buckwheat	No Effect	No Effect
White Bluffs Bladderpod	No Effect	No Effect

3.4.2 Critical Habitat

Effects to critical habitat may include a passage barrier to fall Chinook fry at some screen locations, and disturbance to the immediate area around the screens when they are being replaced or cleaned. However, the effects of the proposed action on PCEs of critical habitat for listed salmonids are expected to be insignificant. Consequently, the Corps has determined the proposed action is not likely to adversely affect salmon, steelhead, or bull trout critical habitat. Effect determinations on critical habitat are summarized in table 11.

Because there is no designated critical habitat for Canada lynx, pygmy rabbit, gray wolf, grizzly bear, Washington ground squirrel, yellow-billed cuckoo, greater sage-grouse, Ute ladies'-tresses, Umtanum Desert buckwheat, White Bluffs bladderpod, or northern wormwood in the proposed project area, the Corps has determined the proposed action would have no effect on their critical habitats if designated or proposed.

Table 11. Effect determinations for designated critical habitat that may occur in the project area.

Species	Critical Habitat Determination
NMFS	
Snake River Spring/Summer Chinook	Not Likely to Adversely Affect
Snake River Fall Chinook	Not Likely to Adversely Affect
Upper Columbia River Spring Chinook	Not Likely to Adversely Affect
Snake River Sockeye	Not Likely to Adversely Affect
Snake River Steelhead	Not Likely to Adversely Affect
Upper Columbia River Steelhead	Not Likely to Adversely Affect
Middle Columbia River Steelhead	Not Likely to Adversely Affect
USFWS	
Bull trout	Not Likely to Adversely Affect
Pygmy Rabbit	None Designated
Canada lynx	No Effect
Gray Wolf	None Designated
Grizzly Bear	None Designated
Ute ladies'-tresses	None Designated
Northern Wormwood	None Designated
Greater Sage-Grouse	None Designated
Yellow-Billed Cuckoo	No Effect
Washington Ground Squirrel	None Designated
Umtanum Desert Buckwheat	No Effect
White Bluffs Bladderpod	No Effect

4 Magnuson-Stevens Act - Essential Fish Habitat

The consultation requirement of section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) directs Federal agencies to consult with NMFS on all actions, or proposed actions that may adversely affect Essential Fish Habitat (EFH). Adverse effects include the direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside EFH, and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

The proposed action includes areas designated as EFH under the MSA for Chinook and coho salmon. The mid Columbia – Lake Wallula, Hydrologic Unit Code (HUC 17070101), upper Columbia-Priest Rapids (17020016), and lower Yakima (17030003) are identified as current EFH for Chinook and coho salmon. The Lower Snake River (HUC 17060110) is identified as current EFH for Chinook and currently accessible, but

unutilized historic EFH for coho salmon, while the Walla Walla (17070102) is identified as currently accessible, but unutilized historic EFH for Chinook and coho salmon.

Based on information provided above, and the analysis of effects presented in the ESA portion of this document, the proposed action may result in short-term, minor adverse effects on some habitat parameters. These adverse effects are: a passage barrier to fall Chinook fry at some screen locations, and disturbance to the immediate area around the screens when they are being cleaned or replaced.

Based upon the short term and localized effects of the proposed action in the project area the Corps concludes that there will be no adverse effect to EFH.

5 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712, as amended) prohibits the taking of and commerce in migratory birds (live or dead), any parts of migratory birds, their feathers, or nests. Take is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof.

The removal of vegetation is not anticipated and no ground disturbance is planned. Migratory birds or their nests will not be affected by the propose action. The Corps has determined there will be no take of migratory birds as a result of the proposed action.

6 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) authorizes the USFWS to evaluate the impacts to fish and wildlife species from proposed Federal water resource development projects that could result in the control or modification of a natural stream or body of water that might have effects on the fish and wildlife resources that depend on that body of water or its associated habitats. The proposed action does not modify a natural body of water and therefore does not involve activities subject to the FWCA.

7 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions, primarily for Native American Tribes. Take under the BGEPA includes both direct taking of individuals and take due to disturbance. Disturbance is further defined in 50 CFR 22.3.

Bald eagles are known to nest throughout Corps managed lands in the Walla Walla District. While all nest sites have not been documented, the locations of two new nest sites were identified within the project area during 2014. One was documented in the Yakima River delta approximately 400 feet east of state highway 240, and the other is located near the mouth of the Walla Walla River approximately ¼ mile west of state

highway 12 (Figure 4). In addition, bald eagles can be found roosting and hunting along the Columbia River during the winter months.

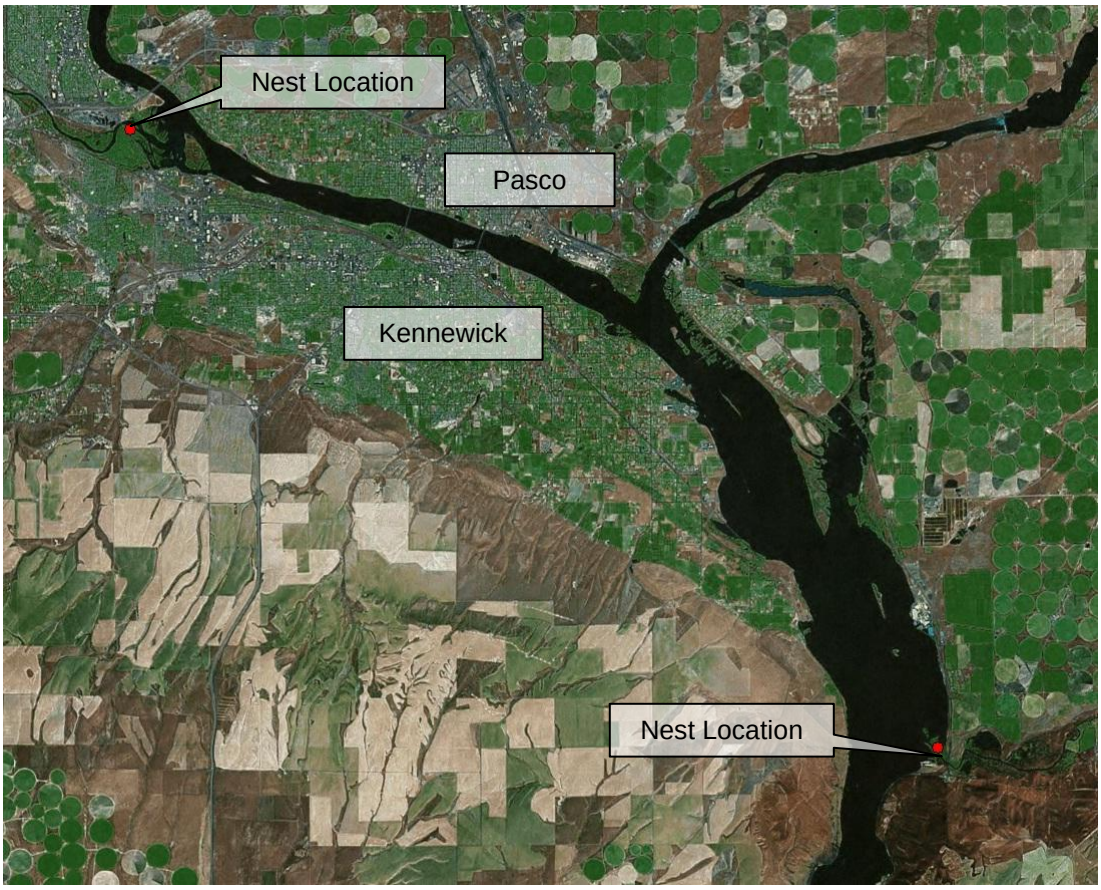

Figure 4. Aerial photo showing location of known eagle nests in the project area.

Golden eagles are distributed worldwide and occupy habitats from alpine meadows to arid deserts. Washington supports nesting golden eagles east and west of the Cascade Mountains, as well as a winter migratory population from nesting populations in Canada and Alaska. The species has been identified as a state candidate for listing due to declines in the number of nesting pairs at historic nests.

Because eagles in the vicinity appear acclimated to the noise and activity of the area, the Corps believes there will be no significant disturbance and no take of eagles as a result of the proposed action.

8 References

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