US Army Corps
of Engineers®
Walla Walla District

INTEGRATED LETTER REPORT AND PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

FEDERAL PARTICIPATION IN NORTHERN PIKE SUPPRESSION IN WASHINGTON AND IDAHO THROUGH THE AQUATIC PLANT CONTROL PROGRAM

APPENDIX A, BIOLOGICAL ASSESSMENT PREPARED FOR THE NATIONAL MARINE FISHERIES SERVICE

US Army Corps
of Engineers®
Walla Walla District

Federal Participation in Northern Pike Suppression in Washington and Idaho Through the Aquatic Plant Control Program

WALLA WALLA DISTRICT
WASHINGTON

Federal Natural Resources Law Compliance
and
Programmatic Biological Assessment
and
Consultation Initiation Package

ADMINISTRATIVE RECORD – DO NOT DESTROY

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EXECUTIVE SUMMARY

This Programmatic Biological Assessment (PBA) is prepared pursuant to Section 7(a)(2) of the Endangered Species Act (ESA) to evaluate the effects of the U.S. Army Corps of Engineers, Walla Walla District (USACE), proposed Northern Pike Control Cost Share Program (proposed action) in Washington and Idaho on listed species under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). USACE is authorized by Section 104 of the River and Harbor Act (RHA) of 1958 (33 United States Code [U.S.C.] §610), as amended, to develop the Program to protect the Columbia River Basin from invasive northern pike.

This PBA considers implementation of the proposed action, where USACE proposes to cost share northern pike suppression at multiple locations in Washington and Idaho. Proposed suppression approaches include mechanical, chemical, and electrical removal of northern pike.

USACE concludes that the proposed action “may affect, and is likely to adversely affect four ESA-listed species under the jurisdiction of USFWS and NMFS. USACE further concludes the proposed action “may affect, but is not likely to adversely affect” applicable critical habitat for these species. A complete list of species, critical habitats, and effects determinations are provided in Table ES-1. Conservation measures are proposed to minimize and avoid effects.

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 and the Fish and Wildlife Coordination Act. USACE has also determined the proposed Program would result in no take of species protected by the Migratory Bird Treaty Act, and no take under the Bald and Golden Eagle Protection Act.

USACE requests formal consultation with USFWS and NMFS.

Table ES-1. Effects Determination Summary for Program Implementation

Species	Species Determination	Critical Habitat Determination
Fish and Wildlife Service		
Canada Lynx	No Effect	No Effect
Gray Wolf	No Effect	No Effect
Grizzly Bear	No Effect	No Effect
North American Wolverine	No Effect	No Effect
Pygmy Rabbit	No Effect	No Effect
Southern Mountain Caribou	No Effect	No Effect
Mt. Rainier White-tailed Ptarmigan	No Effect	No Effect
Yellow-billed Cuckoo	No Effect	No Effect
Bull Trout	May Affect, Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect
Kootenai River White Sturgeon	May Affect, Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect
Monarch Butterfly	No Effect	No Effect
Spalding's Catchfly	No Effect	No Effect
Ute Ladies'-tresses	No Effect	No Effect
Whitebark Pine	No Effect	No Effect
National Marine Fisheries Service		
UCR Chinook Salmon	May Affect, Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect
UCR Steelhead	May Affect, Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect

If additional information regarding this document is required, please contact Karl Anderson, Biologist in the Environmental Compliance Section of the U.S. Army Corps of Engineers, Walla Walla District, at (509) 527-7264, or by email at karl.r.anderson@usace.army.mil. Other correspondence can be mailed to:

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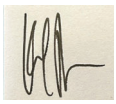
The undersigned certifies that this Consultation Initiation Package was developed by qualified professional scientists using the best available scientific and commercial data.



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FEDERAL PARTICIPATION IN NORTHERN PIKE SUPPRESSION IN WASHINGTON AND IDAHO THROUGH THE AQUATIC PLANT CONTROL PROGRAM

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ACRONYMS AND ABBREVIATIONS

ac	acre
BA	Biological Assessment
BCR	Box Canyon Reservoir
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practices
℃	Degrees Celsius
CDT	Coeur d'Alene Tribe
CFR	Code of Federal Regulations
CHU	critical habitat unit
CHSU	critical habitat subunit
cm	centimeter
CMs	Conservation Measures
CPUE	catch per unit effort
CTCR	Confederated Tribes of the Colville Reservation
DCH	designated critical habitat
DPS	Distinct Population Segment
Ecology	Washington Department of Ecology
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Units
F	Fahrenheit
ft	foot
FMO	Foraging, Migration, and Overwintering
FR	Federal Register
FWCA	Fish and Wildlife Coordination Act
FWIN	Fall Walleye Index Net
HUC	Hydrologic Unit Code
IDFG	Idaho Fish and Game
IPaC	Information for Planning and Consultation
in	inch
km	kilometer
KNRD	Kalispel Natural Resources Department
MBTA	Migratory Bird Treaty Act
m	meter
mi	mile
MPG	Major population group
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NISC	National Invasive Species Council
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
PBA	Programmatic Biological Assessment
PBF	Physical and Biological Features

PCE	Primary Constituent Element
PFMC	Pacific Fishery Management Council
ppm	parts per million
PUD	Public Utility District
RKM	River kilometers
RM	River miles
RU	Recovery Unit
SOP	Standard Operating Procedure
SPIN	Spring Pike Index Net
SR	Spawning and Rearing
SSA	Species Status Assessment
STOI	Spokane Tribe of Indians
WCT	Westslope Cutthroat Trout
WDFW	Washington Department of Fish and Wildlife
UCR	Upper Columbia River
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

SECTION 1 - PROPOSED ACTION

The U.S. Army Corps of Engineers (USACE), Walla Walla District, proposes to implement a Northern Pike Control Cost Share Program (proposed action) that provides matching funds (cost share) to assist Tribes and state agencies in Washington and Idaho in suppressing northern pike (*Esox lucius*).

This programmatic biological assessment (PBA) is prepared in accordance with Section 7(a)(2) of the Endangered Species Act (ESA) to (1) streamline and consolidate ESA Section 7 consultation for activities conducted under the program that may affect ESA-listed species and their critical habitats in the action area including monitoring, suppression, drawdown, public outreach, and coordination; and (2) to promote better conservation outcomes from these activities on ESA-listed species and their critical habitats. It evaluates the potential impacts of the proposed action on ESA-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). Information presented in this BA is from numerous sources in whole or in part (e.g., USFWS 2002, etc.).

The objective of the proposed action is to provide cost-share assistance for controlling the population of northern pike in the areas they currently inhabit and prevent their further migration downstream in the Columbia River system. The management strategy will involve a combination of methods, including mechanical removal, chemical control, fishing incentives, and targeted monitoring.

Northern pike, an invasive species not native to the area, has spread across various regions in Idaho and Washington. Its introduction in the 1950s through unauthorized stocking in Montana's rivers facilitated its establishment in the Columbia River Basin. By the 1970s, the species had expanded into the Flathead River system and was also introduced illegally in the Coeur d’Alene River system (Bernall and Moran, 2005). Since then, northern pike have extended their range to include the Pend Oreille River, Spokane River (Bennett and Rich, 1990; Scholz et al., 2009), and the Columbia River upstream of the Grand Coulee Dam(Figure 1-1).

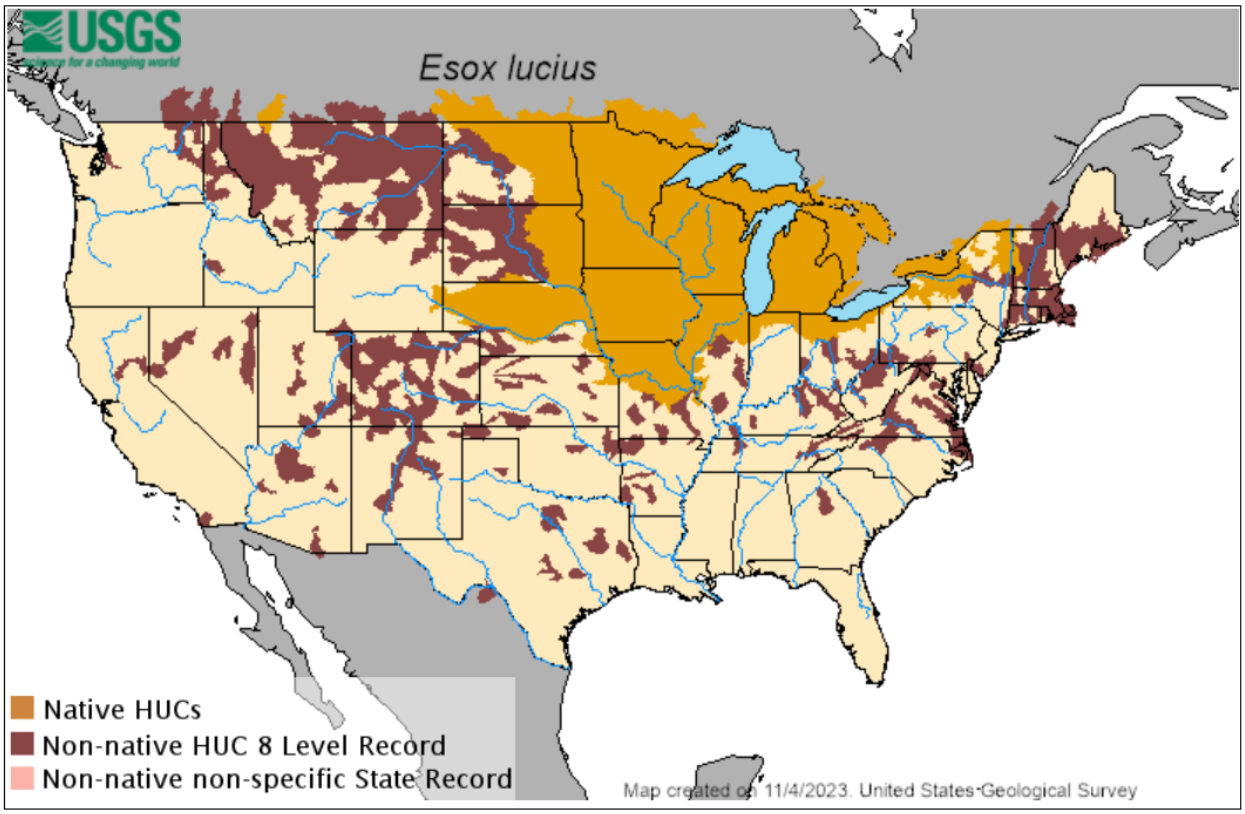

Figure 1-1. Distribution of Northern Pike in the United States in Native and Non-Native Hydrologic Unit Codes (HUC) 8 Level
(Fuller and Neilson 2023)

In Washington, northern pike are found in six HUC 8 watersheds including: Franklin D. Roosevelt Lake, Hangman, Kettle, Lake Washington, Lower Spokane, and Pend Oreille (Fuller and Neilson 2023). In Idaho, northern pike are found in ten HUC 8 watersheds including: Clearwater; Coeur d'Alene Lake; Lower Boise; Lower Clark Fork; Lower Kootenai; Pend Oreille; Pend Oreille Lake; Spokane; St. Joe; Upper Spokane (Fuller and Neilson 2023).

In its natural setting (Figure 1-2), northern pike prefer to hide in areas of ample aquatic vegetation patiently awaiting prey to ambush. The fish is easily recognizable by its elongated body, spotted pattern, and distinctive snout.

Figure 1-2. Northern Pike
Photo credit: Ryan Hagerty/USFWS

As a species that primarily feeds on fish, northern pike have significantly reduced native salmonid populations, leading to a decline in these species (Sepulveda et al., 2014). Due to their impact, the Western Governors' Association has identified northern pike as one of the top 25 aquatic invasive species (WGA, 2018).

There is risk that northern pike might spread below the Grand Coulee and Chief Joseph dams on the Columbia River. It is crucial to prevent their establishment in these areas to protect native fish species, including those listed under the ESA, from predation and potential population reduction.

1.1.1 Authority

This proposed action would be implemented under the authority of Section 104 of the River and Harbor Act of 1958 (33 United States Code [U.S.C.] §610), as amended by the Water Resources and Development Act of 2022, which authorizes USACE to administer a comprehensive program to provide for prevention, control, and progressive eradication of noxious aquatic plant growths and aquatic invasive species from the navigable waters, tributary streams, connecting channels, and other allied waters of the United States, in the combined interest of navigation, flood control, drainage, agriculture, fish and wildlife conservation, public health, and related purposes, including continued research for development of the most effective and economic control

measures, to be administered by the Chief of Engineers, under the direction of the Secretary of the Army, in cooperation with other Federal and State agencies (See 33 U.S.C. §610(a).).

1.1.2 Action Area

The term “action area” is defined in the regulations as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50 CFR 402.02). An action includes activities or programs “directly or indirectly causing modifications to the land, water, or air” (50 CFR 402.02). In this case, the action area is rivers and lakes within the orange shaded areas of Figure 1-3 which includes waters above Grand Coulee dam to the Idaho-Montana boarder, Columbia River below Grand Coulee to Wells Dam, and the Okanagan River watershed. Activities will occur within waterways located in the action area with transportation to work sites occurring via existing roads, rights-of-ways, levees, and boat ramps.

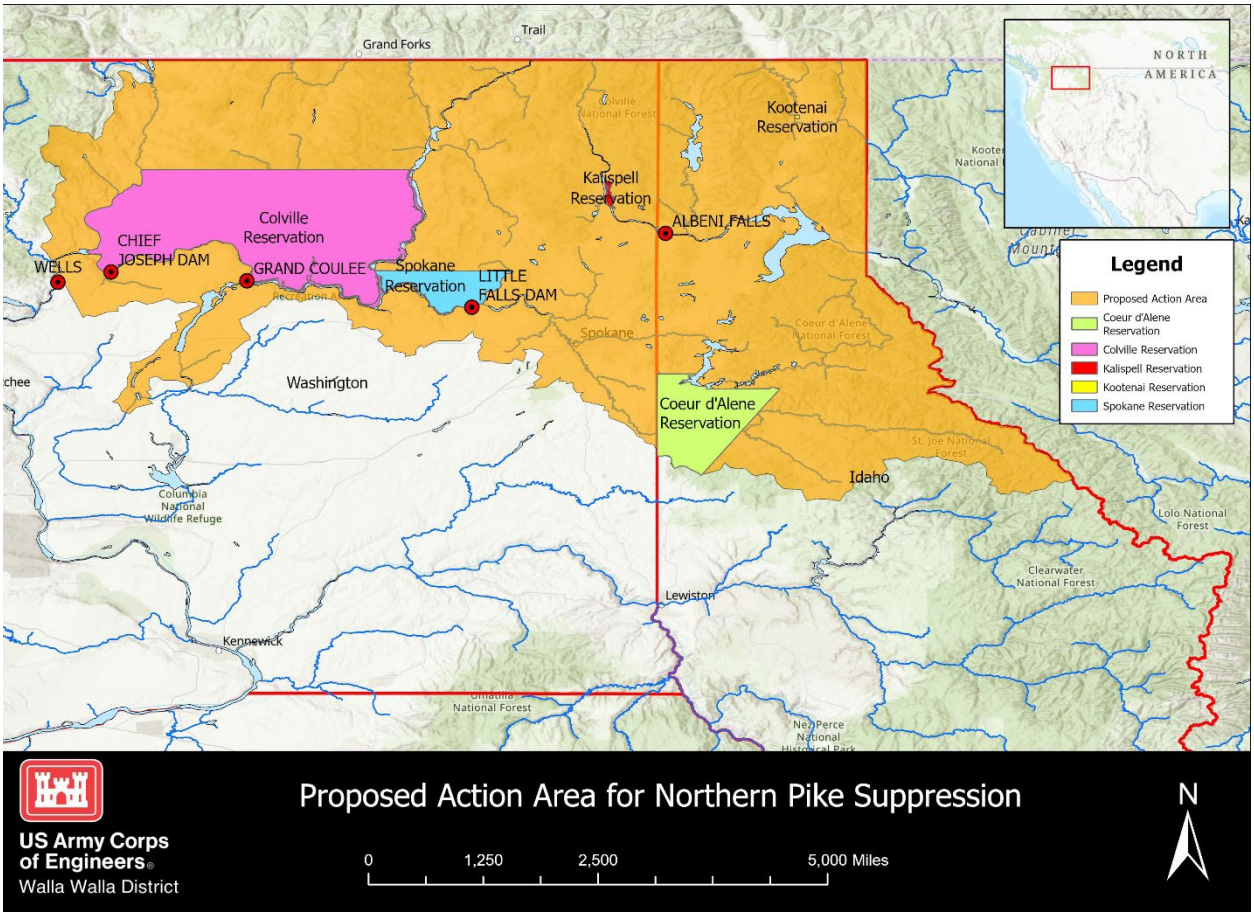

Figure 1-3. Proposed Action Area of Northern Pike Suppression in the Two-State Area

1.1.3 Description of the Proposed Action

The proposed action consists of USACE providing co-funding annually, as funds are available, to Tribes and Washington Department of Fish and Wildlife (WDFW) for northern pike suppression. There are no restrictions on the numbers of northern pike removed.

Northern pike, being an invasive species, significantly reduce fish populations and alter fish communities. They pose a considerable threat to the Columbia River ecosystem through predation and competition for food resources, and they could potentially lead to the extinction of vulnerable species. Every northern pike removed from an ecosystem is promoting recovery among the prey populations of fish and listed fish who can also be prey to northern pike. The presence of northern pike in Lake Roosevelt and Coeur d'Alene Lake has prompted the Lake Roosevelt Co-managers, which include the Confederated Tribes of the Colville Reservation (CTCR), Spokane Tribe of Indians (STOI), and WDFW to develop and implement comprehensive removal plans. Similar plans are currently being executed in the upper regions of Lake Roosevelt, Kettle River, and Coeur d'Alene Lake. These plans provide for the extension of removal activities into additional locations within the action area as needed.

USACE would provide matching funds, commensurate with available funding, to Tribes and state agencies to implement those activities described in this PBA, which are part of their currently ongoing and future northern pike management actions within the action area (Figure 1-3). Each location would have individualized protocols and would be carried out by applicable implementing Tribes and/or state. Should the northern pike be discovered in new locations and treatments at these new locations be proposed for cost-sharing, the Conservation Measure number three (CM-3) Superseding Process for Review and Inclusion of Projects, Methods, Materials, or Locations that are Substantially Similar or having Substantially Similar Effects would be followed. Currently, there is not an active northern pike suppression program by the Kootenai Tribe in the Kootenai River; should that program start, it would also be addressed through CM-3.

Specific northern pike control activities implemented each year will be determined at a local level by participating states and Tribes and described in detail in their annual work plans, which will be attached and submitted to USACE with an annual work plan notification form (Appendix A). Only treatments as described below would be eligible for cost-sharing by USACE and would fall, broadly, into seven categories of actions: monitoring, suppression, eradication, drawdown, public outreach, and reward program.

1.1.3.1 Monitoring Actions

Monitoring efforts include the cost sharing ongoing monitoring for presence or absence of northern pike within, upstream, and downstream of the proposed action area.

eDNA Monitoring

Environmental DNA (eDNA) is a monitoring technique that identifies the DNA organisms release into their environment, allowing for the detection of species. This method is particularly effective in aquatic environments, where it can identify the presence or absence of species, even those in low abundance (Dunker et al. 2016). The process involves collecting water samples at sites distributed throughout the proposed action area (Fig. 1-3) and subsequently testing in a laboratory for DNA, providing a cost-effective and efficient way to detect northern pike in new areas. Detection is crucial for managing northern pike spread and preventing the establishment of large, unmanageable populations (Laramie et al. 2015; Carmin et al 2016). Following any new detection, mechanical control or suppression would be needed to remove the northern pike.

The CTCR conducted eDNA monitoring at 50 sites twice per year in the upper Columbia River and its tributaries from the Okanogan River upstream to the Canadian border on the Kettle River. The sites were sampled in May, July, and September. The eDNA monitoring indicated that northern pike are moving lower in the reservoir compared to previous years, with more positive sites in the downstream end of the reservoir. To date, northern pike have been detected in the Kettle River, but not downstream of Grand Coulee Dam in Rufus Woods Reservoir or in the Okanogan River.

During 2023, a total of 111 water samples were collected from 52 sites and tested for northern pike eDNA. Due to access issues in the spring only five of the sites below Chief Joseph Dam and the Okanogan River were sampled. All of these samples were negative for northern pike eDNA (Jasper et al. 2023).

Telemetry

Telemetry is a technology used to remotely monitor and track the movements and behaviors of animals, including fish, using electronic tags. In fisheries, telemetry involves tagging fish with acoustic or radio transmitters that emit signals detected by receivers or tracking devices. This method provides detailed data on fish movement, habitat use, and migration patterns. For northern pike, telemetry can help managers understand their spatial distribution, identify spawning and feeding areas, and monitor responses to control efforts. By tracking individual pike, fisheries managers can refine suppression strategies, target critical habitats, and evaluate the effectiveness of management actions over time.

1.1.3.2 Suppression Actions

Suppression actions include cost sharing ongoing suppression actions in the proposed action area. Suppression actions of northern pike will consist of five (5) methods: gillnetting, beach seining, fyke netting, electrofishing, hook and line.

Gillnetting

A gillnet (Figure 1-4) is a vertical wall of monofilament or twine netting designed to wedge and capture fish as they attempt to swim through.

Figure 1-4. Gillnetting from a Boat to Catch Northern Pike
Photo credit: Confederated Tribes of the Colville Reservation Fish and Wildlife

Capture occurs when a fish is stuck in the mesh at its point of greatest girth. Gilling (also capture) occurs when a fish penetrates the mesh and the twine slips behind the gill cover preventing the fish from escaping. Gillnets are also known to entangle non-targeted fish and other marine organisms (DeAlteris 1998).

Gillnetting can be an effective means of controlling invasive northern pike populations (Sepulveda et al. 2013, Baxter and Neufeld 2015, Bean 2014, Walrath et al. 2015). The suppression gillnetting efforts incorporate three seasonal phases, the northern pike pre-spawn and spawning period (February-May), the post-spawning period (June-August), and juvenile rearing (September – November).

Section 3.2 describes the current gillnetting catch of northern pike removed by gillnetting by the Tribes at different areas within the proposed action area as well as bycatch of other species of fish.

Beach Seining

Beach seines (Figure 1-5) are low cost and can capture northern pike and have minimal harm to bycatch.

Figure 1-5. Beach seine and Captured Northern Pike on Lake Roosevelt
Photo credit: Confederated Tribes of the Colville Reservation Fish and Wildlife

Beach seines are difficult to pull through thick aquatic vegetation, limiting their utility in ideal northern pike natal habitat. Beach seining is used to target young of the year northern pike (≤ 150 mm Total Length) in known rearing. This method is used during the peak summer months when the reservoir is busy with anglers and recreational boaters. In 2021 the majority of the Northern Pike were removed with gillnets (77%; n=1,515) followed by beach seining (14%; n=272; McLellan et al. 2022). No beach seining was reported in 2023, 2022, 2020, 2019, and 2018.

Fyke Netting

Fyke nets (Figure 1-6) are used to target young of the year northern pike (≤ 150 mm Total Length) in known rearing locations.

Figure 1-6. Fyke Net Setup to Target Young of the Year Northern Pike
Photo credit: Confederated Tribes of the Colville Reservation Fish and Wildlife

This method is used during the peak summer months when the reservoir is busy with anglers and recreational boaters. CCT reported using fyke netting in 2018 only; catching 24 northern pike (McLellan et al. 2019).

Electrofishing

Aluminum boats equipped with electrofishing systems (Figure 1-7) are used to collect northern pike. Boat electrofishing is used in known rearing areas near Kettle River, Evans Campground, and Colville River when water temperatures are above 16 °C and juvenile northern pike can be collected in less than one (1) m of water.

Figure 1-7 Electrofishing for Northern Pike

Photo credit: Confederated Tribes of the Colville Reservation Fish and Wildlife

This method was successful in 2016, with over 900 northern pike removed in less than 20 hours of sampling (STOI and CCT unpublished data).

Boat electrofishing was effective at capturing juvenile northern pike during the 2018 and 2019 project years (McLellan et al. 2018, 2019) catching 11 and 7 pike. During 2020, the electrofishing boats were not available due to mechanical issues. The CTCR were able to resume boat electrofishing sampling in 2021, catching four (4) northern pike in 2021 and 20 in 2022 (Table 1-1). There was no electrofishing bycatch of bull trout or white sturgeon reported.

Table 1-1. Relevant Fish Species Captured during Confederated Tribes of the Colville Reservation (CTCR) Lake Roosevelt Electrofishing Suppression, 2018-2022.

Species*	# Collected	Year
Northern Pike	20	2022
Northern Pike	4	2021
Northern Pike	N/A	2020
Northern Pike	7	2019
Northern Pike	11	2018

* No bull trout captured. No Kootenai River white sturgeon present.

Due to mechanical and scheduling issues no electrofishing surveys were performed during the 2023 field season. Issues with the boat have been resolved and surveys are scheduled for the summer months in 2024 (Jasper et al. 2023).

The Spokane Tribe of Indians (STOI) conducted 18 boat electrofishing transects from August 23–30, 2023, for a total of 7.9 hours of effort. No northern pike were collected during electrofishing surveys (Table 1-2).

Table 1-2. Summary of Key Fish Captured during Spokane Tribe of Indians Northern Pike Electrofishing Suppression, 2018-2022.

Species	# Collected	Year
Northern Pike	0	2023
Northern Pike	2	2022
Northern Pike	N/A	2021
Northern Pike	N/A	2020
Northern Pike	0	2019
Northern Pike	264	2018

* No bull trout captured. No Kootenai River white sturgeon present.

STOI crews conducted 18 boat electrofishing transects from July 25-28, 2022, for a total of 7.8 hours of effort. Surveys took place in the Kettle River, Colville River, Haag Cove, Summer Island, and Nancy Creek. Two northern pike were collected from electrofishing with lengths 393 and 450 mm (Table 1-2). Boat electrofishing compliments gillnet suppression efforts, allowing for removal of northern pike with minimal impact to non-target fishes.

Hook and line

Although not currently done by Tribal fisheries staff or WDFW staff; removal by angling for northern pike is another possible technique that can targets northern pike specifically. Note this would be for cost sharing staff only; USACE would not cost share for public fishing.

1.1.3.3 Eradication Actions

Eradication actions include cost sharing ongoing eradication actions in the proposed action area. When feasible, eradication (i.e., complete removal of all individuals in a population) of northern pike is the preferred management option in the state of Washington. This approach allows for the rapid restoration of native and/or important game fish assemblages and minimizes costs associated with long-term suppression. Eradication tools considered by WDFW and Tribes include the use of the piscicide rotenone. Eradications actions of northern pike will consist of one method: rotenone.

Rotenone

Rotenone is currently available and registered by the U.S. Environmental Protection Agency (EPA) as a restricted-use pesticide for fish management (EPA 2007). Rotenone is a product of the Legume (bean) family and is the only piscicide currently approved for use in the state of Washington (Hisata 2002; Finlayson et al. 2018). When used at recommended concentrations for invasive fish eradications, rotenone is expected to be lethal to fish, zooplankton, many macroinvertebrates, and frog tadpoles, but not harmful to birds, mammals, or adult stages of most amphibians (Vinson et al. 2010; Finlayson et al. 2018; Dunker et al. 2022).

If it is determined that rotenone will be required to meet the eradication objectives, applicators must adhere to product label restrictions and follow the protocols and procedures specified in the Rotenone Standard Operating Procedures (SOP) Manual 2nd Edition (Finlayson et al. 2018), as well as laws and regulations of all jurisdictions. Pesticide applications to waters of the state must also meet the terms and timelines identified by the Clean Water Act which is administered by the Washington Department of Ecology (Ecology) via a National Pollutant Discharge Elimination System (NPDES) pesticide general permit.

Northern Pike have been detected and subsequently eradicated in three state of Washington lakes (Table 1-3). In all cases, lakes were treated with rotenone.

Table 1-3. Overview of historical Northern Pike eradication efforts in the state of Washington.

Year	Waterbody	County	Volume (Ac-Ft)	Quantity	Rotenone Product/Formulation Concentration	Detoxification Time	Application Method
2012	Fish Lake	Spokane	1357	54 gal CFT+ 8,621 lbs of powder	3.6 ppm	4.5 months[2]	Boat
2015	Upper Lead King Lake	Pend Oreille	110.5	129 gal + 5 lbs of powder	3.6 ppm	1.5 months	Helicopter, Backpack Spray
2015	Lower Lead King Lake	Pend Oreille	65.8	77 gal + 5 lbs of powder	3.6 ppm	5.5 months	Helicopter, Backpack Spray
2015	Beaver Pond adjacent to Lead King Lakes	Pend Oreille	3.4	4 gal CFT	3.6 ppm	5.5 months	Helicopter, Backpack Spray
1998	Crocker Lake	Jefferson	ND	ND	ND	ND	ND

Rotenone will only be used in water bodies with no ESA listed aquatic species. See conservation measures in Section 1.1.3.8.

1.1.3.4 Drawdown Surveying

Drawdown surveying actions include cost sharing ongoing drawdown survey actions in the proposed action area. Reservoir drawdowns are conducted independently for operational purposes not related to surveys. Drawdowns are typically done to lower reservoir levels to accommodate spring freshets. Peak drawdowns occur around May 1. Since northern pike can be particularly sensitive to water level changes (e.g., stranded due to their specific habitat needs during the spawning period (Figure 1-8), drawdown surveys (done by observation) are conducted opportunistically in areas dewatered as a result of reservoir drawdowns (e.g., mudflats, etc.).

Figure 1-8. Stranded Northern Pike Found during a Drawdown Survey
Photo credit: Confederated Tribes of the Colville Reservation Fish and Wildlife

Northern pike can become stranded on mud flats during the spring drawdown of Lake Roosevelt. Northern pike stranding has been documented when the reservoir surface elevation reaches 384.8 m (1262.5 ft) at Barnaby Flats and 384.0 m (1259.8 ft) at Kamloops Campgrounds on the Kettle River. In 2022, the lowest Lake Roosevelt was drawn down was 380.5 m (1248.5 ft) on April 21. Stranding was observed at Barnaby Flats on February 14 and again on March 2.

In 2023, 6 pike were observed stranded in surveys at Lake Roosevelt (Jasper et al. 2023). In 2022, ten pike were observed stranded in surveys at Lake Roosevelt (McLellan et al. 2023). In 2021, lake levels did not drop enough to survey (McLellan et al. 2022). In 2020, 404 pike were observed stranded in surveys at Lake Roosevelt (McLellan et al. 2021). In 2019, 150 pike were observed stranded at Lake Roosevelt (McLellan et al. 2020).

1.1.3.5 Public Outreach

Public outreach includes cost sharing ongoing public outreach actions in the proposed action area. Public outreach will be conducted in a manner to ensure the public is educated on the adverse effects northern pike pose to local watersheds and economies, and are also informed of northern pike management actions. Public outreach actions include posting northern pike informational signs at boat launches and fishing locations (Figure 1-9), and sharing northern pike information through brochures, emails, articles, podcasts, and booths at events.

Figure 1-9. Northern Pike Sign Posted at Boat Launches and Fishing Locations throughout Lake Roosevelt
(McLellan et al. 2018)

Holistic Ecosystem Management Partnership

Combine indigenous ecological insights with global expertise by fostering collaborations among local communities, academia, research institutions, and international specialists to develop comprehensive suppression solutions.

Community-Based Monitoring Initiative

This initiative promotes active engagement in environmental stewardship through the expansion of citizen science and community-led programs, training participants to contribute to northern pike monitoring and data collection efforts.

Public Education

Educate the public on the adverse effects northern pike pose to local watersheds and economies and inform on management actions. Enhance and expand online platforms and mobile apps that engage the public in reporting northern pike sightings and catches. Install and maintain signage, purchase advertisements, conduct outreach and education campaigns.

The Co-managers of Lake Roosevelt will collaborate with regional stakeholders in various forums to educate the public on the adverse effects northern pike introductions can have on an ecosystem and regional economies.

Coordination Actions

The expansion of invasive fish species in localized populations and their distribution poses increasing complexities in management. This challenge necessitates enhanced coordination among various management agencies at local, state, and regional levels. The diverse aspects of managing these species underscore the importance of active engagement and participation by the Tribe in local and regional management discussions.

1.1.3.6 Reward Program

Incentivized Angler Engagement Program

Public fishing competitions and reward-based initiatives to motivate and involve anglers in northern pike removal efforts, leveraging community participation for enhanced ecological impact. For the cost-share program, only activities that are related to setting up or organizing these reward programs or events are eligible. Due to USACE regulations, we cannot cost -share prizes or cash bounties. USACE can cost share expenses to run, set-up, organize, and plan such efforts but cannot cost share cash prizes, physical prizes, or pay out/price per fish (bounties included) due to the rules in multiple federal laws prohibiting such actions.

The Lake Roosevelts Northern Pike Reward Program was implemented as one part of the Comprehensive Lake Roosevelt Northern Pike Removal Strategy. This strategy was developed with the eight key points listed by Pasko and Goldberg (2014); 1) define management plans and objectives, 2) manage costs, 3) understand the target species population dynamics, 4) evaluate potential ecological outcomes, 5) monitor for unintended outcomes, 6) prevent re-introduction, 7) incorporate adaptive management, and 8) conduct public outreach.

The Colville Tribe secured three years of funding ($15,000 a year) from Chelan Public Utility District (PUD), Grant PUD, and CCT internal funds to support the program through 2019.

- Pike Reward Program rules can be found on the Colville Tribe's website: https://www.cct-fnw.com/news/.

- The CCT developed the Northern Pike Reward Program Rules (see below) with input from the co-managers and the National Park Service. These set of rules ensured the program would stay on budget, anglers would abide by current fishing regulations, established payout limits, and specific steps for anglers to follow.

- A limit of $590 per angler/year was established to reduce administrative costs associated with sending 1099 tax forms to anglers that receive $600 a year or more https://www.irs.gov/pub/irs-pdf/i1099msc.pdf.

In 2023, a total of 26 anglers turned in 75 Northern Pike heads for a total payout of $750 (Jasper et. al. 2023). In 2022, the CTCR paid a total of $1,250 to local anglers who participated in the Northern Pike Reward Program (Reward Program). To date, anglers have received a total of $35,050 through this Reward Program; with a total of 3,505 northern pike removed by anglers (McLellan et al., 2023).

1.1.4 Conservation Measures

USACE proposes the following conservation measures (CM) as part of the proposed action in order to avoid or minimize potential adverse effects related to implementation of the proposed action.

The following CMs will be implemented by USACE and the implementing Tribes and WDFW participating in the cost share program, in relevant part:

CM-1. Northern Pike Work Plan Annual Notification Form (ANF): For each project in each year, an ANF will be provided for review and approval by USACE (Appendix A). The annual ANF will include all actions to be implemented, locations of all actions identified on a map, a schedule of all actions for the year, identification of weekly bycatch thresholds, applicable CMs to be followed, USFWS ESA-listed species/Critical Habitat present in the Action Area, and applicable Terms and Conditions from the biological opinion issued.

CM-2. USACE Review and Electronic Submission of Annual Notification Form to the Services**:** For each project proposed to be carried-out under this proposed action, USACE will review the proposed project to determine whether it meets criteria below and is therefore appropriately considered to be covered by the biological opinion issued by the Services for the proposed action.

a. Covered Activity: The proposed project falls within the description of an activity in the proposed action.
b. Applicable CMs: The proposed project meets all applicable CMs.
c. Within Evaluated Effects: The proposed project will not cause an effect to the listed species or critical habitat that was not considered in the biological opinions.
d. Incidental Take Statement Conformance: The proposed project conforms to all applicable Terms and Conditions (T&Cs) in the Incidental Take Statement (ITS) of the biological opinions.

e. Minor Project Modifications: USACE may propose minor project modifications (e.g., work timing, etc.) on a case-by-case basis and as part of the electronic submission, with USFWS's verification that the resulting environmental and biological effects of the modification fit within the provisions of the biological opinions issued.
g. Electronic Submission: Once USACE determines that a project satisfies all of the above criteria, USACE will submit a copy of the ANF to USFWS and NMFS

CM-3. Superseding Process for Review and Inclusion of Projects, Methods, Materials, or Locations that are Substantially Similar or having Substantially Similar Effects: Instances may arise where a project's extent, methodology, or equipment type does not exactly fit in the scope or scale of work defined by the BE/BA. There may be cases where the methods or CMs require modification to operate as intended. If the activities would result in effects substantially similar to other activities, USACE will have the ability to engage in the superseding process with USFWS and the National Marine Fisheries Service (NMFS).

In these instances, USACE may propose to use new methods, materials, or locations not considered in this BE/BA, or propose a project that may deviate from methods or CMs in a minor fashion. USACE must first determine that the modification will have effects on ESA-listed species or designated critical habitat that are substantially similar to the effects considered in this BE/BA, and submit its determination to USFWS and NMFS. If USACE makes that preliminary determination, it must provide that rationale to USFWS and NMFS in writing via email and request permission to rely on the most recent consultation to satisfy its ESA Section 7 consultation obligations. If USFWS/NMFS determines that the effect of implementing the new/modified activity is substantially similar to the effects discussed in the BE/BA, then USFWS/NMFS may approve the new/modified activity, on that case-specific basis alone.

CM-4. Site access: USACE will retain right of access to sites authorized using this document in order to monitor the use and effectiveness of permit conditions. The USFWS and NMFS will be allowed access to project sites as requested.

CM-5. Salvage notice: If a sick, injured, or dead specimen of a listed species is found, USACE will notify the USFWS Office of Law Enforcement (208-378-5333) and NMFS. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility for carrying out instructions provided by the respective Office of Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

CM-6. Annual Review and Report: USACE, NMFS, and USFWS will conduct an annual review of Program implementation. This review will evaluate, among other things, whether the scope of the activities is consistent with the description of the

proposed activities; whether the nature and scale of the effects predicted continue to be valid; whether the CMs are being complied with and continue to be appropriate; and whether the project-specific consultation procedures are being complied with and are effective. To assist in this review, USACE or their designated representative will submit annual reports to USFWS and NMFS no later than May 1 each year describing activities implemented including coordinates, dates, and a map(s) and shapefile showing the location and type of each field-related action carried out; number of northern pike and bycatch captured; a summary of the extent of take indicators; and any other relevant data or analyses.

CM-7. Full Implementation of CMs Required: USACE will ensure execution of all applicable CMs for any projects implemented under the Program as described in this BA. Failure to comply with all applicable CMs may invalidate protective coverage of ESA section 7(o)(2) regarding “take” of listed species, and may lead USFWS or NMFS to a different conclusion regarding the effects of a specific project.

CM-8. Failure to Report May Trigger Reinitiation: USFWS or NMFS may recommend reinitiation of this consultation if USACE, or their designated representative (if applicable) fails to provide all applicable notification, completion, or annual program reports, or conduct annual coordination through an existing program or ad-hoc.

CM-9. Weekly Bycatch Thresholds: Implementing Tribes and state agencies shall adhere to weekly bycatch thresholds established annually by the Co-managers and these thresholds will be identified in the Annual Northern Pike Work Plan Notification Form (Appendix A). Table 1-4 is an example of bycatch limits.

Table 1-4. Example Weekly Bycatch Thresholds of the Confederated Tribes of the Colville Reservation.

Fish Species	Weekly Threshold
White Sturgeon (wild) – *Acipenser transmontanus*	1
White Sturgeon (hatchery; wild larvae origin 2010-2016)	10
White Sturgeon (hatchery; direct gamete take 2001-2009)	No limit
Bull Trout *Salvelinus confluentus* (US Fish and Wildlife is notified)	1
Kokanee *Onchorhynchus nerka*	10
Mountain Whitefish *Prosopium williamsoni*	15
Hatchery Rainbow Trout *Oncorhynchus mykiss*	50
Burbot *Lota lota*	50

Sucker species *Catostomus* spp.	50
Walleye *Sander vitreus*	100
Smallmouth Bass *Micropterus dolomieu*	100
All other non-native Fish Species	No limit

If a weekly bycatch threshold is reached in a particular area, gillnetting will cease in that area and will be relocated elsewhere for the rest of the week as detailed in McLellan et al. (2018). Gillnet relocation areas are dependent on whether a weekly bycatch threshold is reached before or after June 15th. If a weekly bycatch threshold is reached during a week prior to June 15th in a high priority area, the crews will move to another high priority area for the remainder of the week. If a weekly bycatch threshold is reached during a week after June 15th, the crew will move either upstream or downstream of their current location for the remainder of the week.

CM-10. Action Timing: Overall work windows are identified in Table 1. Site specific conditions would dictate duration and frequency of actions within the overall work window. **For Table 1, x denotes when the action would take place and – denotes when the action would not take place.**

Table 1-5. Work Windows for Monitoring, Suppression, Drawdown, Public Outreach, and Coordination Actions by Month (From McLellan et al. 2018).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monitoring	x	x	x	x	x	x	x	x	x	x	x	x
Population Status	-	-	x	-	-	-	-	-	-	-	x	-
eDNA	-	-	-	-	x	-	-	-	x	-	-	-
Microchemistry	-	-	-	-	x	x	x	x	x	-	-	-
Operations	x	x	x	x	x	x	x	x	x		x	x
Suppression	x	x	x	x	x	x	x	x	x	x	x	x
Gillnetting	-	x	x	x	x	x	x	x	x	x	x	-
Seining	-	x	x	x	x	x	x	x	x	x	x	-
Fyke Nets	-	x	x	x	x	x	x	x	x	x	x	-
Electrofishing	-	-	-	-	-	-	-	x	x	x	x	-
Drawdown Survey	-	x	x	x	x	-	-	-	-	-	-	-
Public Outreach	x	x	x	x	x	x	x	x	x	x	x	x
Coordination	x	x	x	x	x	x	x	x	x	x	x	x

CM-11 eDNA Collection Protocols: Samples will be *collected* from the stream

margin, thalweg, or, in larger streams, from a decontaminated boat following acceptable standard protocols (e.g., https://s3.wp.wsu.edu/uploads/sites/686/2017/01/WSU-eDNA-sampling-protocol-Jan2017.pdf).

CM-12. Gill Net Deployment:

a. Standard deployment methodologies described in Monitoring Resources Protocol No. 3354 and in Hubert (1996) will be followed. The Tribes and states will each provide a trained, specialized gillnetting vessel and crew.

b. Gill net sites will be adaptively selected and will be fished no longer than 36 hours (typically 23 hours) to minimize capture of non-target fish species (i.e., bycatch).

c. All bycatch will be identified, enumerated, and (with exception of listed species that will be handled according to CM-5) released back into the water near the capture site.

CM-13. Gill Net Type and Specifications: The following six net types with several specification options (Table 2; - denotes a blank.) may be used:

(1) Fall Walleye Index Net (FWIN): An experimental monofilament sinking net with eight panels comprised of different mesh sizes. This is the standard net for state-wide FWIN surveys conducted annually.

(2) Spring Pike Index Net (SPIN): An experimental monofilament sinking net with five panels.

(3) CCT Predator Net: An experimental monofilament sinking net with six panels.

(4) CCT Kokanee Net: A monofilament sinking net that consists of a single mesh size.

(5) Multi-filament (1): A multi-filament (twisted nylon) sinking net that consists of a single mesh size.

(6) Multi-filament (2): An experimental multi-filament (twisted nylon) sinking net that consists of five panels, identical to SPIN net panels.

Table 1-6.Gillnet Specification Options for Suppression Surveys.

Panel Mesh Size in. (mm)	**1.0 (25)**	**1.5 (38)**	**2.0 (51)**	**2.5 (64)**	**3.0 (76)**	**3.5 (89)**	**4.0 (102)**	**5.0 (127)**	**6.0 (152)**
	Panel Number								
FWIN (60.96 x 1.82); mesh panels equal in length	1	2	3	4	5	-	6	7	8
SPIN (45.72 x 1.82); mesh panels equal in length	-	-	1	2	3	4	5	-	-
CCT Predator (60.96 x 1.82); 64 mm panel =	-	-	1	2	3	-	4	5	6

22.86 m long; all other panels 7.62 m long.									
CCT Kokanee (45.72 x 1.82); all one mesh size	-	-	1	-	-	-	-	-	-
Multi-filament (1) (60.96 x 1.82); all one mesh size	-	-	1	-	-	-	-	-	-
Multi-filament (2) (60.96 x 1.82); mesh panels equal in length	-	-	1	2	3	4	5	-	-

CM-14. Beach Seine Deployment:

a. Standard methods described in Monitoring Resources Protocol No. 3355 and in Hayes et al. (1996) will be followed.

b. Two seine nets will be used depending on the habitat selected for the survey. Seine #1 will be used in large bays (≥ 183 m wide) and seine #2 will be used in smaller bays (≤ 183 m).

CM-15. Active Participation in Collaborative Forums: Annually engage in forums, task forces, working groups, and meetings. These platforms will focus on identifying, prioritizing, and developing best management practices. They will also concentrate on innovative techniques for suppressing or eradicating non-native species, identifying new focal areas, and enhancing native fish populations. Proposals and work elements consistent with the scope of this project will be formulated through these collaborative efforts.

CM-16. Involvement in Coordination Meetings: Participate in various coordination meetings, forums, and events that specifically address invasive species management. These engagements will occur at both local and regional levels, underlining the importance of collaborative approaches in tackling this environmental challenge.

CM-17. Rotenone treatments only in water bodies without ESA-listed aquatic species. Whole water body applications permitted. The Permittee must comply with all the requirements on the Product Label. Permit requirements do not reduce the requirements on the Product Label. Treatments must be performed by or under the supervision of a licensed applicator. All pesticide applicators must have current training in the use of equipment necessary to apply rotenone formulations correctly. ESA-listed fish species must not be present at the time of treatment. Follow the product label restrictions and 2018 AFS Rotenone SOP Manual.

CM-18. Reward Program Rules. These are the current rules for the established reward program, any future programs will adapt the same rules in spirit. Anglers participating in the Northern Pike Reward Program must adhere to the following

rules:

1. Adhere to all applicable state/tribal fishing regulations for the area in which you fish. Contact your local state or tribal fishery agency for license requirements and current fishing regulations.

2. Provide true and accurate information to authorized program representatives regarding the taking, possession, delivery, transportation, or any other use of fish caught while participating in the Northern Pike Reward Program.

3. Comply with the directions of authorized program personnel related to the collection of sampling data and angler participation in the Northern Pike Reward Program.

4. Anglers must completely fill out the Pike Head tag information at the designated drop off area. Fish heads must be placed in a freezer bag, with the head label and dropped into the freezer. Or brought to a CCT Fish and Wildlife Office.

5. Fish must have been caught in the mainstem Columbia River from Wells Dam upstream to the Canadian border, the Spokane River upstream to Little Falls, the Kettle River, or the Okanogan River. A random number of heads will be selected for microchemistry analysis to confirm the fish's origin.

6. There are no size restrictions on northern pike that are eligible for the reward.

7. 7. Participants may receive $10 for every northern pike head deposited into the designated location, up to an individual maximum of $590 per calendar year.

8. All participants must be 17 years or older to receive the reward.

9. All fish to be redeemed for the reward must have been personally caught solely by the angler submitting them for the reward.

10. Fish head must be in good condition and clearly identifiable. Unidentifiable heads will not be accepted or awarded.

11. Violations of any of the above rules may result in participant disqualification from the Northern Pike Reward Program.

12. The Northern Pike Reward Program can be suspended or terminated at any time at the discretion of the Colville Tribes Fish and Wildlife program.

USACE can cost share expenses to run, set-up, organize, and plan such efforts but cannot cost share cash prizes, physical prizes, or pay out/price per fish (bounties included) due to the rules in multiple federal laws prohibiting such actions.

SECTION 2 - LISTED SPECIES

2.1 SPECIES LISTED IN THE ACTION AREA

USACE reviewed information from several sources—including the USFWS' Information for Planning and Consultation (IPaC), Federal Register (FR) notices, NMFS website, and various literature—to ascertain those Endangered Species Act listed species (ESA-listed species) that could occur within the action area under the jurisdiction of the USFWS and/or NMFS (Table 2-1).

Table 2-1. Endangered Species Act Proposed, Threatened, and Endangered Species listed in the action area.

Common	Scientific Name	Status	Critical Habitat
USFWS Species			
Canada Lynx	*Lynx canadensis*	T	Final
Gray Wolf	*Canis lupus*	E	Final
Grizzly Bear	*Ursus arctos horribilis*	T	Proposed
North American Wolverine	*Gulo gulo luscus*	T	N/A
Pygmy Rabbit	*Brachylagus idahoensis*	E	N/A
Southern Mountain Caribou	*Rangifer tarandus ssp. caribou*	E	Final
Mt. Rainier White-tailed Ptarmigan	*Lagopus leucura rainierensis*	T	N/A
Yellow-billed Cuckoo	*Coccyzus americanus*	T	Final
Bull Trout	*Salvelinus confluentus*	T	Final
Kootenai River White Sturgeon	*Acipenser transmontanus*	E	Final
Monarch Butterfly	*Danaus Plexippus*	Proposed T	Proposed
Spalding's Catchfly	*Silene spaldingii*	T	Proposed
Ute Ladies'-tresses	*Spiranthes diluvalis*	T	N/A
Whitebark Pine	*Pinus albicaulis*	T	N/A
NMFS Species			
UCR Chinook Salmon	*Oncorhynchus tshawytscha*	E	Final
UCR Steelhead	*Oncorhynchus mykiss*	T	Final

Critical habitat designations are listed under the species Status column: E = Endangered, T = Threatened.

2.2 USFWS SPECIES AND CRITICAL HABITAT STATUS

2.2.1 Canada Lynx

Listing History

Canada lynx (*Lynx canadensis*) was listed as threatened March 24, 2000, due to potential impacts to lynx habitat and the availability of snowshoe hare and other prey

populations within the lynx range. The USFWS recommended delisting Canada lynx in their most recent 5-year status review (USFWS 2017a).

Life History/Biological Requirements

Canada lynx prefer boreal forest with snowy winters (Aubry et al. 1999; Ruggiero et al. 1999) and a supply of snowshoe hare as a prey base (Apps 1999; Mowat et al. 1999). Lynx survivorship, productivity, and population dynamics are closely related to snowshoe hare density in all parts of its range with high natural mortality and low to no reproduction coinciding with the minimum cyclic hare densities (Mowat et al. 1999). In the U.S., lynx inhabit conifer and mixed conifer-hardwood stands that support snowshoe hare.

Distribution and Critical Habitat

Critical habitat was designated November 9, 2006. The U.S. populations cover six populations and seven states (Figure 2-1).

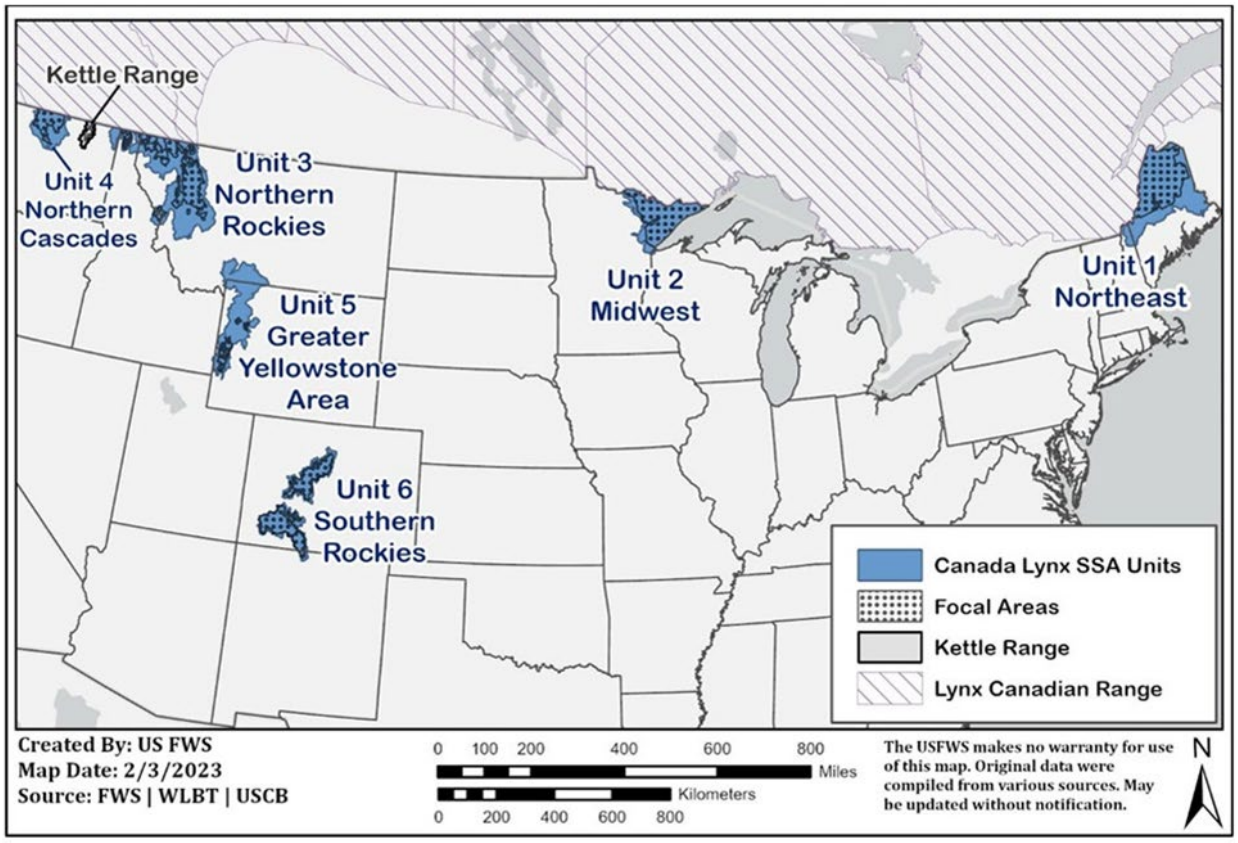

Figure 2-1. Range of the Canada lynx (USFWS 2023).

Threats

Habitat loss and destruction may influence snowshoe hare populations. Climate change may also impact these species.

2.2.2 Gray Wolf

Listing History

The gray wolf was listed as an endangered species on January 4, 1974. On May 5, 2011, 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. Presently, gray wolves outside of the Northern Rocky Mountains Distinct Population Segment (DPS) remain listed.

Life History/Biological Requirements

Wolves live in groups called packs, which typically include a breeding pair (the alpha pair), their offspring, and non-breeding adults. Wolves are capable of mating by age two or three and occasionally forming lifelong bonds. Lifespan is around 13 years and breed past 10 years of age. On the average, five pups are born in early spring and are cared for by the entire pack.

For the first six weeks, pups are reared in burrows called dens. Dens are often used year after year. Pups depend on their mother's milk for the first month, then are gradually weaned and fed regurgitated meat brought by pack members. By the time pups are seven to eight months old they are almost fully grown and begin traveling with the adults. After a year or two, young wolves may leave to try to find a mate and form a pack. Lone, dispersing wolves have traveled as far as 594 mi (965.6 km) in search of a mate or territory.

Their territories range in size from 50 mi² (80.5 km²) to more than 1,000 mi² (1,609.3 km²), depending on the available prey and their seasonal movements. Wolves travel over large areas to hunt, as far as 30 mi (48.2 km) in a day (USFWS 2011a).

Distribution and Critical Habitat

Critical habitat was designated in Michigan and Minnesota on March 9, 1978, but not within the action area. Gray wolves once ranged from coast to coast and from Alaska to Mexico. They were absent from the Southeast, which was occupied by red wolves (*Canis rufus*), and from the large deserts of the Southwest. Wolves occur presently in the Blue and Cascade Mountain ranges of Washington and Oregon, and throughout the Rocky Mountains in Idaho, Montana, and Wyoming (Figure 2-2).

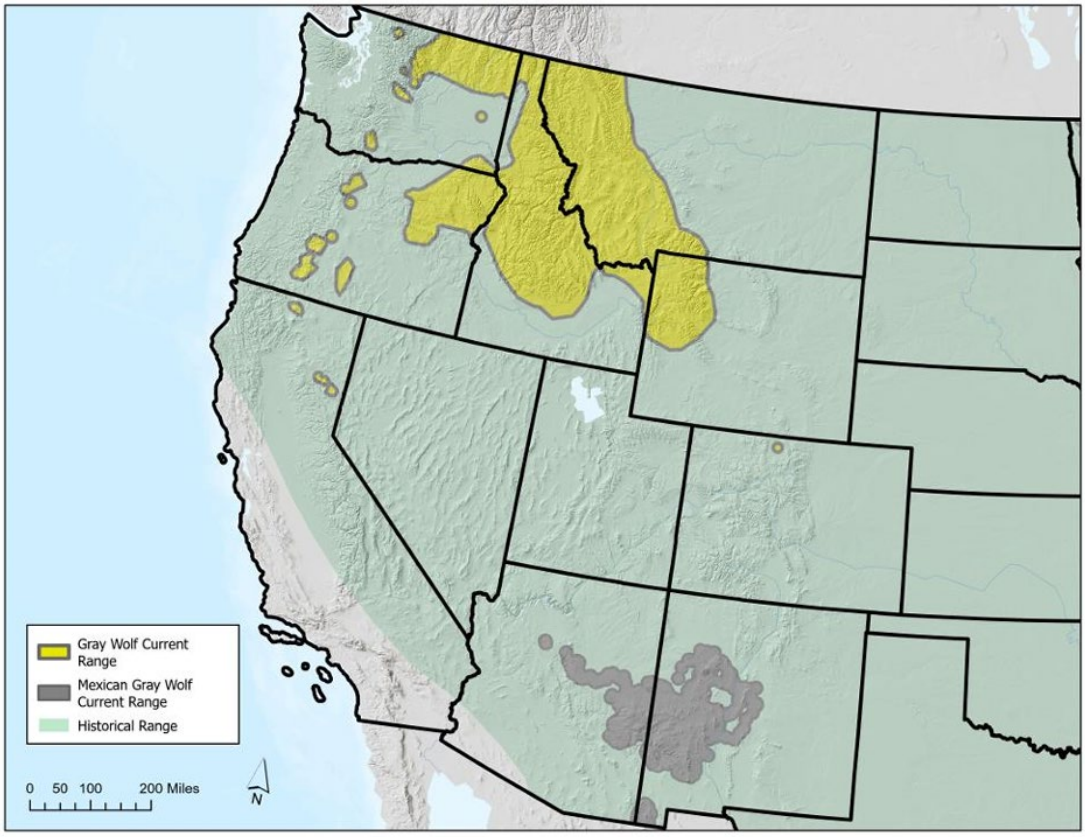

Figure 2-2. Historical (green) and current (yellow) gray wolf range in the Western United States (USFWS 2023).

Threats

Threats to western gray wolves include the integrity of prey species populations, and their habitats. Humans are also a threat (habitat destruction through development, conflicts with livestock, vehicle collisions, etc.). Controversy over predation on livestock and game animal populations makes illegal hunting an ongoing threat.

2.2.3 Grizzly Bear

Listing History

Grizzly bear in the lower 48 were listed as threatened July 28, 1975. The Greater Yellowstone ecosystem population has been delisted due to recovery June 30, 2017. An experimental population occurs in the Bitterroot ecosystem of Montana and the North Cascades ecosystem population is currently under review for listing.

Life History/Biological Requirements

Grizzlies are omnivorous with a broad adaptability to food sources. Grizzlies are also opportunistic feeders and scavengers that prey on almost any available food. They

prefer forest cover with full canopies, but access within 0.6 mi (1 km) to open meadows is also preferable.

Grizzlies den up in winter to hibernate during periods of deep snow, cold temperatures, and low to no food availability. The onset of hibernation appears to correlate with shortening photoperiod and inclement weather.

Age and sex structures are variable, determined mainly by factors such as habitat condition. Mating occurs late May through mid-July, with a peak in mid-June.

Distribution and Critical Habitat

Critical habitat for the grizzly bear was proposed November 5, 1976, but a final rule was never published, and the current status of the proposal is unknown. Historically, grizzlies occupied the mid-west plains west to the California coast, and south into Texas and Mexico; however, through human disturbance and eradication efforts, the grizzly range in lower 48 states is confined to large expanses of wilderness in Montana and Idaho, the Northern Cascades, and Yellowstone National Park (Figure 2-3).

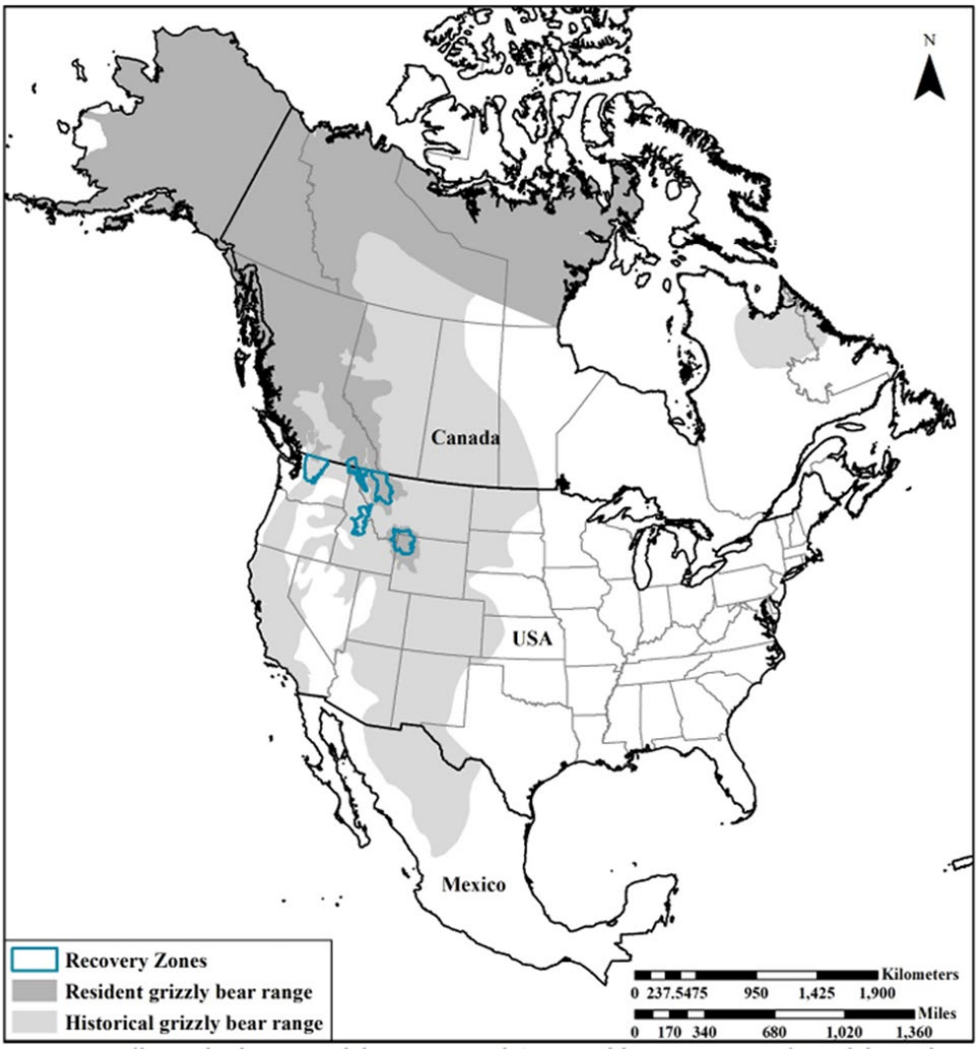

Figure 2-3. Map of historical and current grizzly bear range in North America (USFWS 2022).

Threats

Human conflict and habitat loss remain the greatest threats to grizzly bears. Through unregulated hunting and habitat destruction, the approximately 50,000 grizzly bears that historically roamed the lower 48 states have been reduced to only a few thousand among the various populations.

2.2.4 North American Wolverine

Listing History

Since 1985, the North American wolverine was a candidate species under consideration for listing as threatened. This species was proposed for listing as threatened in 2013.

Life History/Biological Requirements

Wolverines occur in a wide variety of alpine, boreal, and arctic habitats including boreal forests, tundra, and western mountains in North America. They do not appear to specialize on specific vegetation or geological habitat aspects, but instead select areas that are cold and receive enough winter precipitation to reliably maintain deep persistent snow late into the warm season. The requirement of cold, snowy conditions means that, in the southern portion of the species' range where ambient temperatures are warmest, wolverine distribution is restricted to high elevations, while at more northerly latitudes, wolverines are present at lower elevations and even at sea level in the far north.

Wolverines are opportunistic feeders and consume a variety of foods depending on availability. They primarily scavenge carrion, but also prey on small animals and birds, and eat fruits, berries, and insects. Wolverines have an excellent sense of smell that enables them to find food beneath deep snow.

Breeding generally occurs from late spring to early fall. Females undergo delayed implantation until the following winter to spring, when active gestation lasts from 30 to 40 days. Litters are born from mid-February through March, containing one to five kits, with an average in North America of between one and two kits. Female wolverines use natal (birthing) dens that are excavated in snow. Persistent, stable snow greater than 5 ft (1.5 m) deep appears to be a requirement for natal denning, because it provides security for offspring and buffers cold winter temperatures.

Distribution and Critical Habitat

Critical habitat has not been designated for the North American wolverine. Currently, wolverines appear to be distributed as functioning populations in two regions in the

contiguous United States: the North Cascades in Washington, and the northern Rocky Mountains in Idaho, Montana, and Wyoming (Figure 2-4).

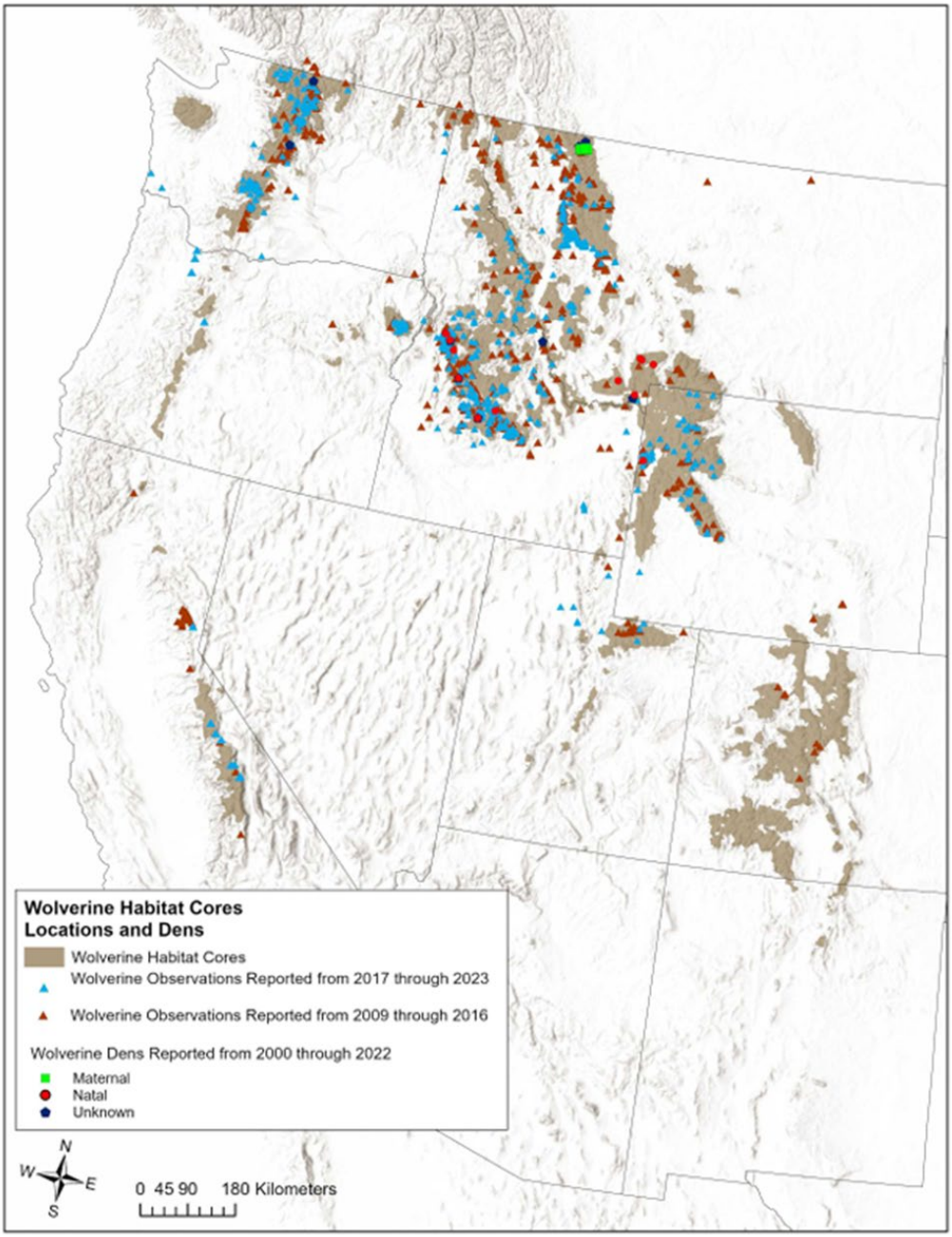

Figure 2-4. Current Wolverine observations and habitat cores (USFWS 2023).

Wolverines were likely extirpated, or nearly so, from the entire contiguous United States in the first half of the 20th Century. The available evidence suggests that, in the second half of the 20th Century and continuing into the present time, wolverine populations have expanded in the North Cascades and the northern Rocky Mountains, but that

populations have not been reestablished in the Sierra Nevada Range or the southern Rocky Mountains.

Threats

The USFWS has identified the following factors that threaten the wolverine: (1) climate change, (2) human use and disturbance, (3) dispersed recreational activities, (4) infrastructure development, (5) transportation corridors, and (6) land management. Trapping has been a primary cause of wolverine mortality and unregulated trapping is believed to have played a role in their decline as additive mortality.

2.2.5 Pygmy Rabbit

Listing History

On November 30, 2001, USFWS, published an emergency rule to federally list the Columbia Basin DPS of the pygmy rabbit as endangered. March 5, 2003, USFWS published a final rule listing the Columbia Basin pygmy rabbit as endangered, without critical habitat designation.

Life History/Biological Requirements

Pygmy rabbits have relatively small home ranges during winter, remaining within roughly 98 ft (30 m) of their burrows, although some snow burrows may extend outward over 328 ft (100 m). Pygmy rabbits have larger home ranges during spring and summer. Home range estimates in Washington are considerably larger than those of pygmy rabbits in other portions of their historical distribution.

Recent records from studies in Idaho indicate that juvenile pygmy rabbits often undertake a single, rapid dispersal movement at 6 to 10 weeks of age, and that some juvenile animals may disperse over 6.2 mi (10 km) during this period. Adult pygmy rabbits may disperse over 7.5 mi (12 km) between their more restricted, seasonal use sites.

Pygmy rabbits breed after their first year and, in Washington, breeding occurs from January through June. Gestation in captive pygmy rabbits is from 22 to 24 days. Females can produce from one to four litters per year.

Distribution and Critical Habitat

No critical habitat has been designated for the Columbia Basin pygmy rabbit. The historical distribution of the pygmy rabbit included much of the semiarid shrub steppe biome of the Great Basin and adjacent intermountain regions of the western United States and included portions of Montana, Idaho, Wyoming, Utah, Nevada, California, Oregon, and Washington (Figure 2-5).

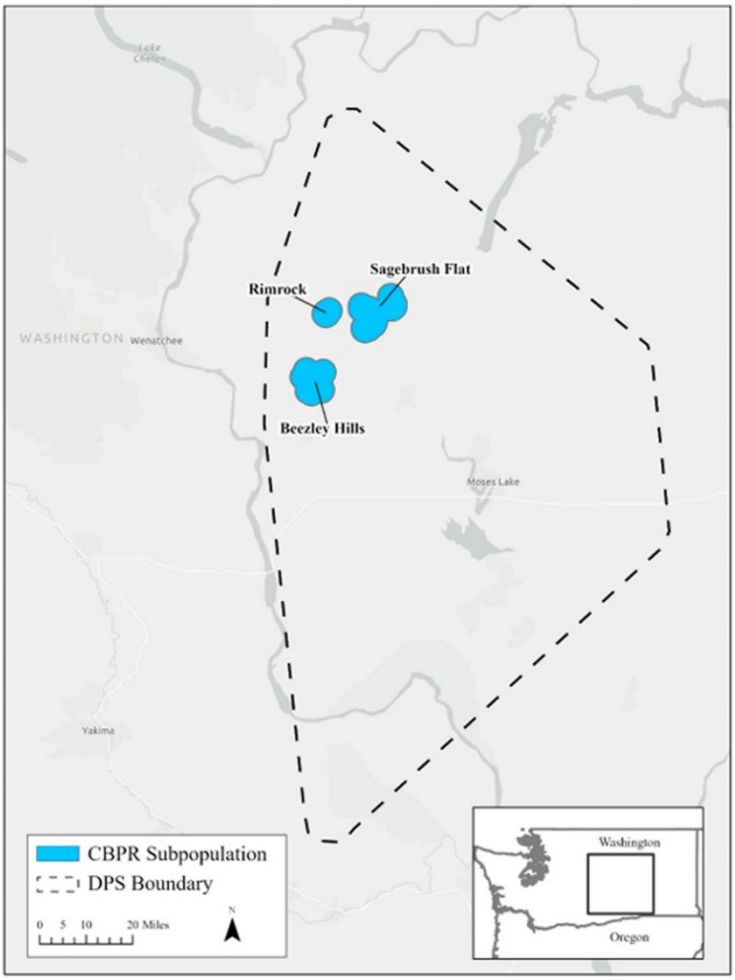

Figure 2-5. Map of currently designated Columbia Basin pygmy rabbit currently designated DPS (USFWS 2024).

Pygmy rabbits occur in a variety of semiarid shrub steppe habitat types that are found throughout their historical distribution. The Columbia Basin ecosystem, which extends from northern Oregon through eastern Washington, encompasses the entire Washington State population of the pygmy rabbit, which is the only pygmy rabbit population that occurs within the Columbia Basin.

Threats

Large-scale loss and fragmentation of native shrub steppe habitats, primarily for agricultural development, likely played a primary role in the long-term decline of the Columbia Basin pygmy rabbit. However, it is unlikely that these factors alone directly influenced the eventual extirpation of all known subpopulations from the wild. Once a population declines below a certain threshold, it is at risk of extirpation from a number of influences including chance environmental events (e.g., extreme weather), catastrophic habitat loss or resource failure (e.g., from wildfire or insect infestations), predation,

disease, demographic limitations, loss of genetic diversity, and inbreeding. At the time of the emergency listing action in 2001, the Columbia Basin pygmy rabbit was imminently threatened by its small population size, loss of genetic diversity, and inbreeding depression, coupled with a lack of suitable, protected habitats in the wild. To varying degrees, all of the above influences continue to impact the Columbia Basin pygmy rabbit and, in combination, have resulted in the population's endangered status.

2.2.6 Southern Mountain Caribou

Listing History

The southern Selkirk Mountains population of woodland caribou (*Rangifer tarandus caribou*) as endangered was listed January 14, 1983. The southern mountain caribou DPS of woodland caribou consists of 17 subpopulations (15 extant and 2 extirpated).

Life History/Biological Requirements

Unlike the more familiar barren ground caribou, woodland caribou usually remain in relatively small, in-cohesive groups. In the Selkirks, group size ranges from single females during calving season to groups of approximately 25 during late winter. The largest group sizes are encountered during rut and late winter, whereas spring and summer groups are generally small (2-5 individuals).

The food habits of caribou are unique in the deer family. Although caribou eat a wide range of foods, winter foraging is limited almost exclusively to arboreal lichens (*Alectoria* spp. and *Bryoria* spp.). Selkirk caribou generally depend on arboreal lichens for up to 6 months of the year. During the remainder of the year, Selkirk caribou feed extensively on huckleberry leaves, Sitka valerian (*Valeriana sitchensis*), boxwood (*Pachistima myrsinites*), and smooth woodrush (*Luzula hitchcockii*).

Caribou have a low reproductive rate. Females give birth to their first calf generally at age 3. Gestation is 227-229 days, and calves are born in May or June. Pregnant females seek high elevation ridges to calve, possibly as an anti-predator strategy.

Distribution and Critical Habitat

Critical habitat was designated November 28, 2012, and is located in Boundary County, Idaho, and Pend Oreille County, Washington.

Prior to 1900, caribou were distributed throughout much of Canada, and the northeastern, northcentral, and northwestern conterminous United States. Caribou in Idaho historically occurred as far south as the Salmon River. Since the 1960s the last remaining caribou population in the United States has restricted its range to the Selkirk Mountains of northeastern Washington, northern Idaho, and southeastern British Columbia (Figure 2-6).

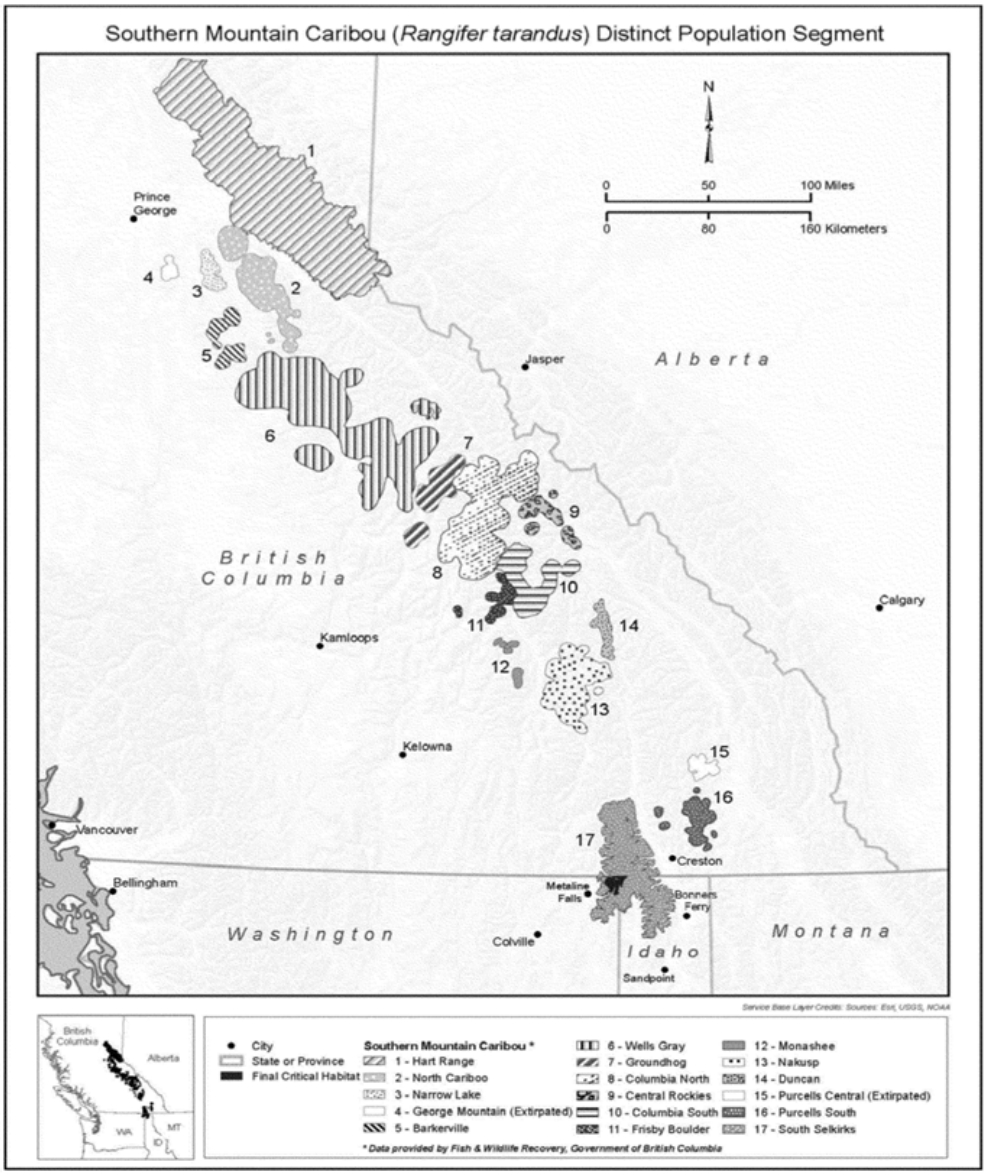

Figure 2-6. Distribution of the 17 subpopulations of southern mountain caribou (USFWS 2019)

Threats

Southern mountain caribou are ranked among the most critically endangered mammals in the U.S. Poaching and accidental killing while hunting poses a threat and research conducted in the 1980s suggests the effects of predation on caribou populations may be more significant than once thought.

Timber harvest alters caribou habitat and creates additional access which increases potential for mortality. Logging can potentially affect caribou habitat by eliminating escape (security) cover, migration corridors, and lichen production. Although food availability is probably not now limiting this caribou population, long-term population survival will partially depend on adequate lichen production and availability. Additionally,

timber harvest may alter historic predator and prey densities, thereby exacerbating the predation issue.

2.2.7 Mount Rainier White-Tailed Ptarmigan

Listing History

The Mount Rainier White-Tailed Ptarmigan (*Lagopus leucura rainierensis*) was listed as threatened August 2, 2024. No critical habitat has been designated for this species.

Life History/Biological Requirements

The Mount Rainier white-tailed ptarmigan is a small alpine grouse, which molts frequently throughout the year to remain cryptic. They are white in winter, mottled with brown and white in spring, and brown in summer. White-tailed ptarmigans are resident or short-distance elevation migrants with numerous adaptations for snow and extreme cold in winter, including feathered feet, a low thermal neutral zone, low evaporative cooling efficiency, high metabolic rate, and behavioral adaptations including snow roosting. In summer, they are intolerant of heat, and remain close to cool microsites such as the edges of snowfields, the shade of boulders, or near streams where temperatures are cool. Incubating females, however, are often exposed to harsh summer sun and high temperatures because they must remain on nests (USFWS 2023).

Distribution and Critical Habitat

The historical range of the Mount Rainier white-tailed ptarmigan likely included alpine and subalpine habitat of the Cascade Range, extending from just north of the Washington/British Columbia border to southwestern Washington, including Mount St. Helens and Mount Adams. Exactly how far north into British Columbia the subspecies' range extends is unknown. The SSA identified eight population units across the subspecies' range (Figure 2-7; USFWS 2023, p. 25).

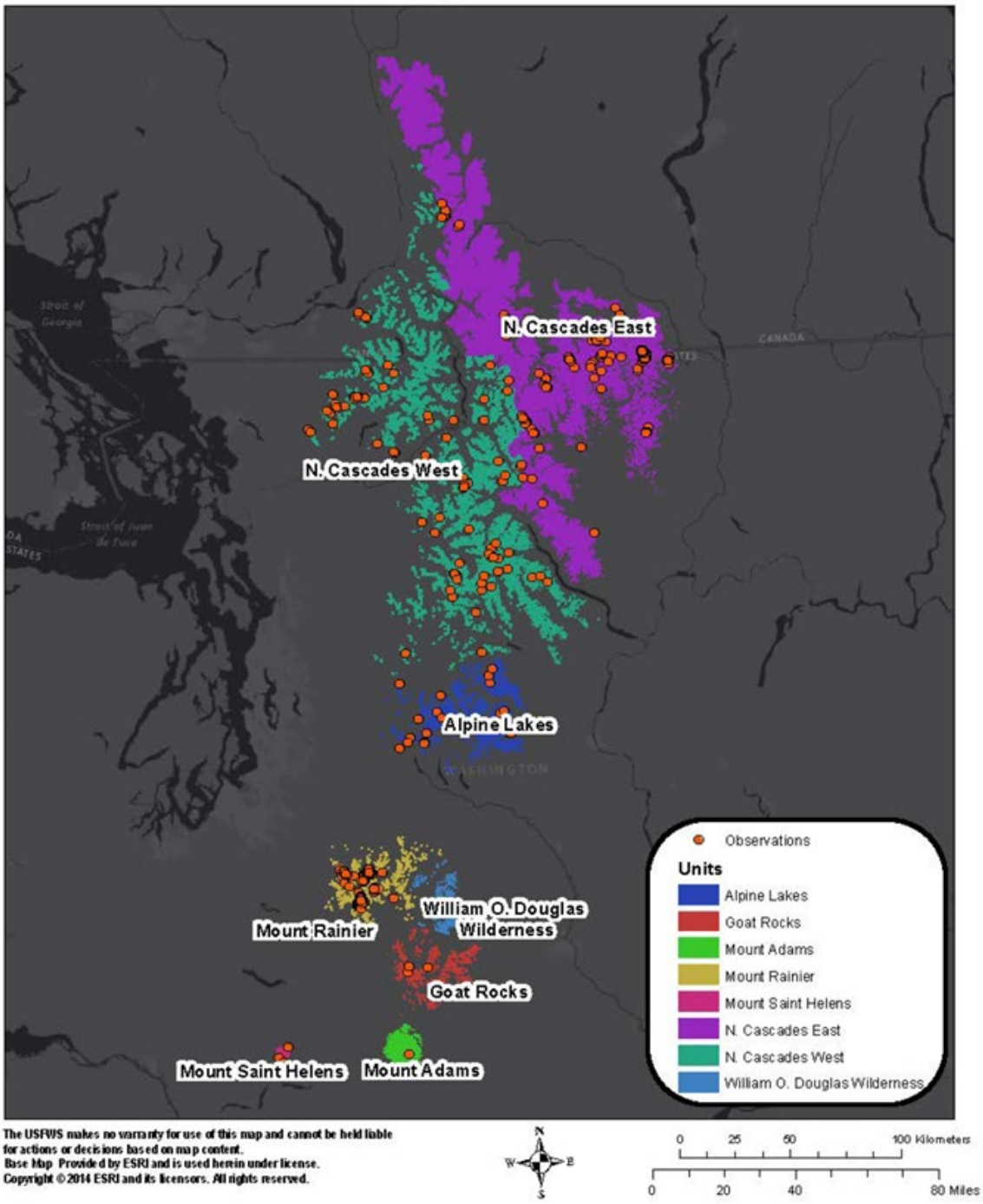

Figure 2-7. Map of Mount Rainier white-tailed ptarmigan population units.

Threats

The threats to the Mt. Rainier white-tailed ptarmigan include: effects to habitat from global climate change, recreation, livestock grazing, and mining; hunting; predation; inadequacy of regulatory mechanisms; population isolation or limited dispersal distances; and population growth rates and physiological response to a warming

climate. Altered temperature and precipitation regimes under climate change may cause the retreat of glaciers and permanent snow in alpine areas. The resulting reduction in water availability in alpine meadows may limit the distribution of moist forbs for adult and juvenile white-tailed ptarmigan foraging, affect insect abundance for chicks, and create warmer and drier microclimates that increase the risk of heat stress in individual ptarmigans (USFWS 2024).

2.2.8 Yellow-billed Cuckoo

Listing History

The western yellow-billed cuckoo was listed as threatened October 3, 2014. The western DPS includes Arizona, California (Baja California, Baja California Sur, Chihuahua, western Durango, Sinaloa, and Sonora), western Colorado, Idaho, western Montana, western New Mexico, Nevada, Oregon, western Texas, Utah, Washington, western Wyoming, and southwest British Columbia.

Life History/Biological Requirements

As summarized by Cornell University (2017b): Yellow-billed cuckoos use wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes. In the Midwest, look for cuckoos in shrublands of mixed willow and dogwood, and in dense stands of small trees such as American elm. In the Southwest, yellow-billed cuckoos are rare breeders in riparian woodlands of willows, cottonwoods, and dense stands of mesquite to breed.

Yellow-billed cuckoo prey largely on caterpillars. On the east coast, periodic outbreaks of tent caterpillars draw cuckoos to the tent-like webs, where they may eat as many as 100 caterpillars at a sitting. Fall webworms and the larvae of gypsy, brown-tailed, and white-marked tussock moths are also part of the cuckoo's lepidopteran diet, often supplemented with beetles, ants, and spiders. They also take advantage of the annual outbreaks of cicadas, katydids, and crickets, and will hop to the ground to chase frogs and lizards. In summer and fall, cuckoos forage on small wild fruits, including elderberries, blackberries, and wild grapes. In winter, fruit and seeds become a larger part of the diet.

Pairs may visit prospective nest sites multiple times before building a nest together. Nest heights can range from 0.98 yards (0.9 m) to as much as 30 yards (27.5 m) off the ground, with the nest placed on a horizontal branch or in the fork of a tree or large shrub. In the West, nests are often placed in willows along streams and rivers, with nearby cottonwoods serving as foraging sites.

The male and female yellow-billed cuckoo build a loose stick nest together, using twigs collected from the ground or snapped from nearby trees and shrubs. The male sometimes continues bringing in nest materials after incubation has begun. Clutch size can range from 1-5 eggs with up to 2 clutches per year.

Distribution and Critical Habitat

Critical habitat was designated April 21, 2021, for yellow-billed cuckoo. The breeding range of the yellow-billed cuckoo formerly included most of North America from southern Canada to the Greater Antilles and northern Mexico (AOU 1957, 1998). In recent years, the species' distribution in the west has contracted. The northern limit of breeding in the western coastal states is now in Sacramento Valley, California, and the northern limit of breeding in the western interior states is southern Idaho [AOU 1998; Hughes 1999 (Figure 2-8)].

Figure 2-8. Historic and Present Distribution of Western Yellow-Billed Cuckoo (Johnson 2009)

The species overwinters from Columbia and Venezuela, south to northern Argentina (Ehrlich et al. 1992; AOU 1998).

Threats

The greatest threat to the species has been reported to be loss of riparian habitat. It has been estimated that 90% of the cuckoo's stream-side habitat has been lost (USFWS 2018). Habitat loss in the west is attributed to agriculture, dams, and river flow management, overgrazing and competition from exotic plants such as tamarisk.

2.2.9 Bull Trout

Listing Status and Current Range

The coterminous United States population of the bull trout was listed as threatened on November 1, 1999 (64 FR 58910). The threatened bull trout occurs in the Klamath River Basin of south-central Oregon; Jarbidge River in Nevada; Willamette River Basin in Oregon; Pacific Coast drainages of Washington, including Puget Sound; major rivers within the Columbia River Basin in Idaho, Oregon, Washington, and Montana; and Saint Mary-Belly River, east of the Continental Divide in northwestern Montana (64 FR 58910). The final listing rule for the United States coterminous population of the bull trout discusses the consolidation of five DPSs into one listed taxon including the Columbia River DPS, which was previously listed separately as a threatened DPS (63 FR 31647, June 10, 1998).

The final Recovery Plan for the Coterminous Bull Trout Population (bull trout recovery plan) established six recovery units (USFWS 2015, pp. 36-43) (Figure 2-9).

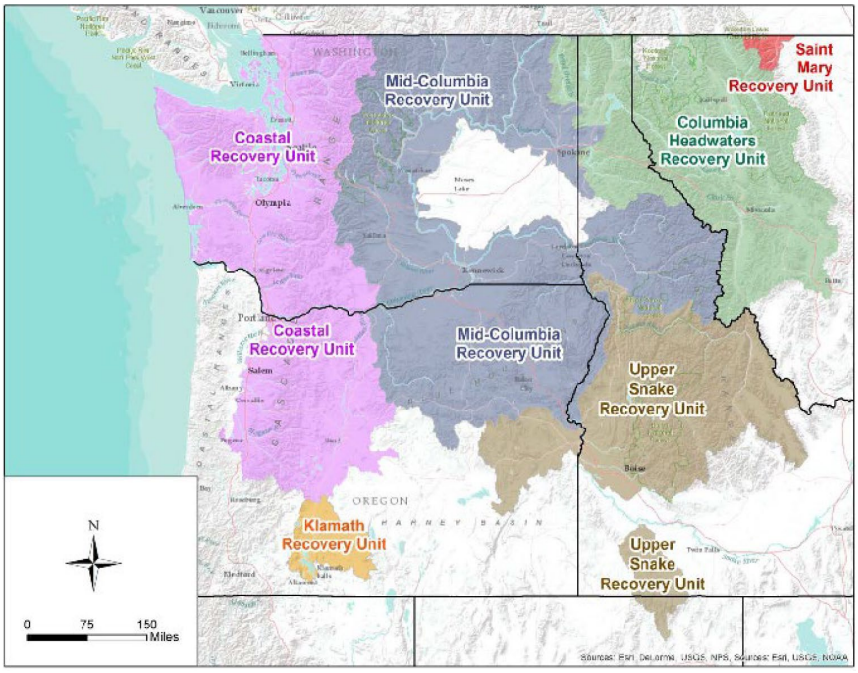

Figure 2-9. Bull Trout Recovery Units in the Coterminous United States

The USFWS indicated these RUs are needed to ensure a resilient, redundant, and representative distribution of bull trout populations throughout the range of the listed entity.

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 (Wydoski and Whitney 2003).

Bull trout normally reach maturity in four to seven years and may live as long as twelve years (Wydoski and Whitney 2003). Migratory bull trout may travel over one hundred miles to their spawning grounds. They generally spawn 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. Juvenile bull trout prey on insects, zooplankton, and small fish while adults and migratory bull trout are dominantly piscivorous.

Distribution and Critical Habitat

Bull trout historically were found in about 60% of the Columbia River Basin. They now occur in less than half of their historic range. Populations remain in portions of Oregon, Washington, Idaho, Montana, and Nevada. Bull trout critical habitat was designated on October 18, 2010 (75 FR 63898).

Threats

While habitat degradation and loss, connectivity among populations, and nonnative fishes such as northern pike are identified among the primary threats to bull trout. The current condition of bull trout is varied across the range (Figure 2-10).

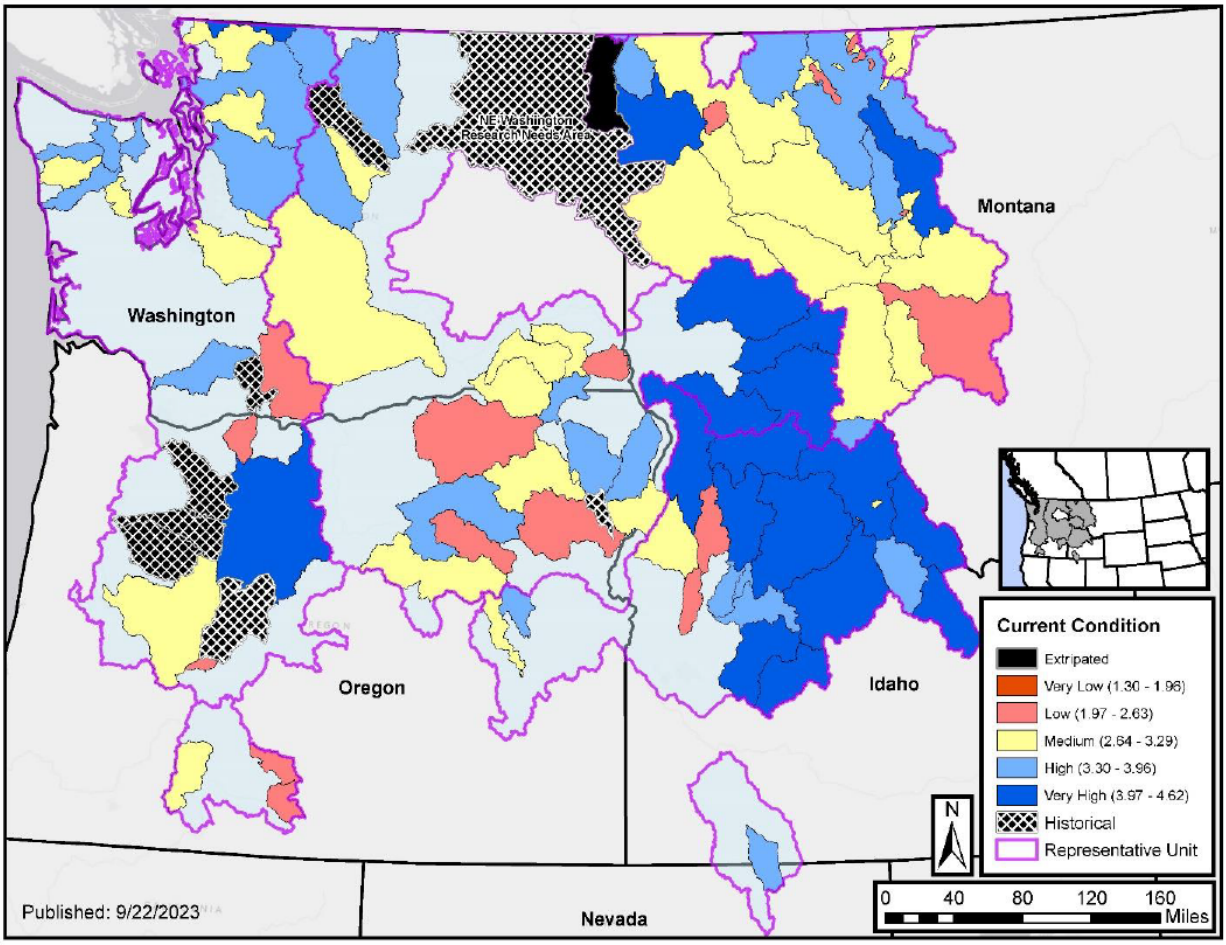

Figure 2-10. Map of current resiliency ratings of the 118 Bull Trout core areas. (USFWS 2024).

Thirty-seven percent (n = 44) of the listed range have high or very high resiliency. In general, core areas with high or very high resiliency occupy large, interconnected habitats with thermal refuge in the form of stream hydrographs driven by snow melt and/or access to foraging, migration, and overwintering (FMO) habitat in lake and large river systems. Typically, these core areas have high demographic scores and few habitat threats.

Medium resiliency is documented in 38 percent (n = 45) of core areas across the listed range. In some cases, medium resiliency core areas have reduced demographic scores but high habitat factor scores. Other medium resiliency core areas have high demographic scores but low habitat scores. Some medium resiliency core areas are spatially limited, simple core areas which limits the maximum scores achievable. Others are larger complex core areas where demographic and/or habitat threats were identified.

Core areas with low resiliency comprise 17 percent (n = 20) of core areas. These core areas have low demographic and habitat scores. Of the 20 core areas with low

resiliency (none have very low resiliency), 55 percent are simple core areas. One core area has become extirpated since listing. Lake Pend Oreille was occupied with low abundance at listing but has since become extirpated (USFWS 2024).

2.2.10 Kootenai River White Sturgeon

Listing History

The Kootenai River distinct population segment (DPS) of white sturgeon (hereinafter referred to as Kootenai River white sturgeon) was listed as endangered on September 6, 1994 (59 FR 45989).

A revised *Recovery Plan for the Kootenai River Distinct Population Segment of the White Sturgeon* was published September 23, 2019. The action area overlaps the recovery plan area.

Life History/Biological Requirements

The Kootenai River white sturgeon became isolated from other white sturgeon in the Columbia River basin during the last glacial age (approximately 10,000 years ago). Once isolated, the population adapted to the predevelopment habitat conditions in the Kootenai River drainage.

Historically, spring runoff events re-sorted river sediments providing a clean cobble substrate conducive to insect production and sturgeon egg incubation. Side channels and low-lying deltaic marsh lands were un-diked at this time, providing productive, low velocity backwater areas. Nutrient delivery in the system was unimpeded by dams and occurred primarily during spring runoff. Floodplain ecosystems like the predevelopment Kootenai River are characterized by seasonal floods that promote the exchange of nutrients and organisms in a mosaic of habitats and thus enhance biological productivity.

Distribution and Critical Habitat

The Kootenai River white sturgeon is one of several land-locked populations of white sturgeon found in the Pacific Northwest. The extent of the Kootenai sturgeon range is from Kootenai Falls, Montana, 31 river miles (RM) (49.9 river kilometers (RKM)) below Libby Dam, Montana, downstream throughout Kootenay Lake, north to Duncan Dam and west to Corra Linn Dam, located downstream of the outflow from Kootenay Lake in British Columbia. Approximately half of the population’s range is located in British Columbia (Figure 2-11).

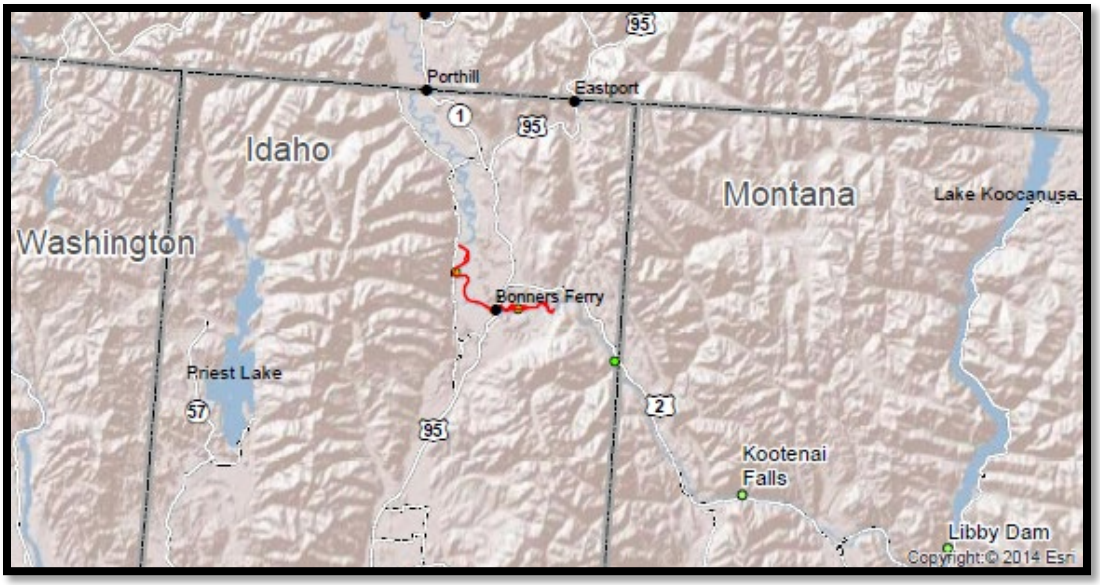

Figure 2-11. Map of Kootenai River Basin showing key features and Kootenai sturgeon critical habitat.

Critical habitat (Figure 2-11) was initially designated for Kootenai River white sturgeon September 6, 2001 (66 FR 46548), followed by an interim designation on February 8, 2006 (71 FR 6383) and a final revised designation July 9, 2008 (73 FR 39506). Kootenai River white sturgeon designated critical habitat is wholly within the action area.

Threats

Modification of the Kootenai River white sturgeon's habitat by human activities has changed the natural hydrograph of the Kootenai River, altering white sturgeon spawning, egg incubation, and rearing habitats; and reducing overall biological productivity. These factors have contributed to a general lack of recruitment in the white sturgeon population since the mid-1960s.

2.2.11 Spalding's Catchfly

Listing History

Spalding's catchfly was listed as a threatened species under the Endangered Species Act on October 10, 2001.

Life History/Biological requirements

Spalding's catchfly is an herbaceous perennial plant in the pink family (Caryophyllaceae). It is a long-lived species that expresses prolonged dormancy for up to six years without leaves if conditions are unfavorable (Lesica 1997; Lesica and Crone 2007). Lesica and Crone (2007) found that prolonged dormancy may increase plant

fitness providing a way to obtain below-ground resources, limiting flower and fruit production.

Little is known about seed productivity, seed bank viability, or dispersal, but it can be assumed that the capsules of Spalding's catchfly serve as an open cup from which seeds are likely carried by the wind, jostled out by passing wildlife, or tossed when plants are knocked over (USFWS 2007a). Seeds are small, flat, and somewhat winged. Plant height and seed characteristics suggest that short-distance wind dispersal may be common.

The plant is found at elevations ranging from 400-1,766.6 yards (365.7-1,615.4 m), usually in deep, productive loess soils (fine, windblown soils). Plants are generally found in swales or on northwest to northeast facing slopes where soil moisture is relatively higher.

Distribution and Critical Habitat

No critical habitat has been designated for this species. In 2007, there were 99 documented populations of Spalding's catchfly (USFWS 2007a). Within the United States, Spalding's catchfly is known from four counties in Idaho (Idaho, Latah, Lewis, and Nez Perce), four counties in Montana (Flathead, Lake, Lincoln, and Sanders), one county in Oregon (Wallowa), and five counties in Washington (Adams, Asotin, Lincoln, Spokane, and Whitman) (Mincemoyer 2005; Oregon Natural Heritage Program 2006; Idaho Conservation Data Center 2007; Montana Natural Heritage Program 2007; Washington Natural Heritage Program 2007; as cited in USFWS 2007a) (Figure 2-12).

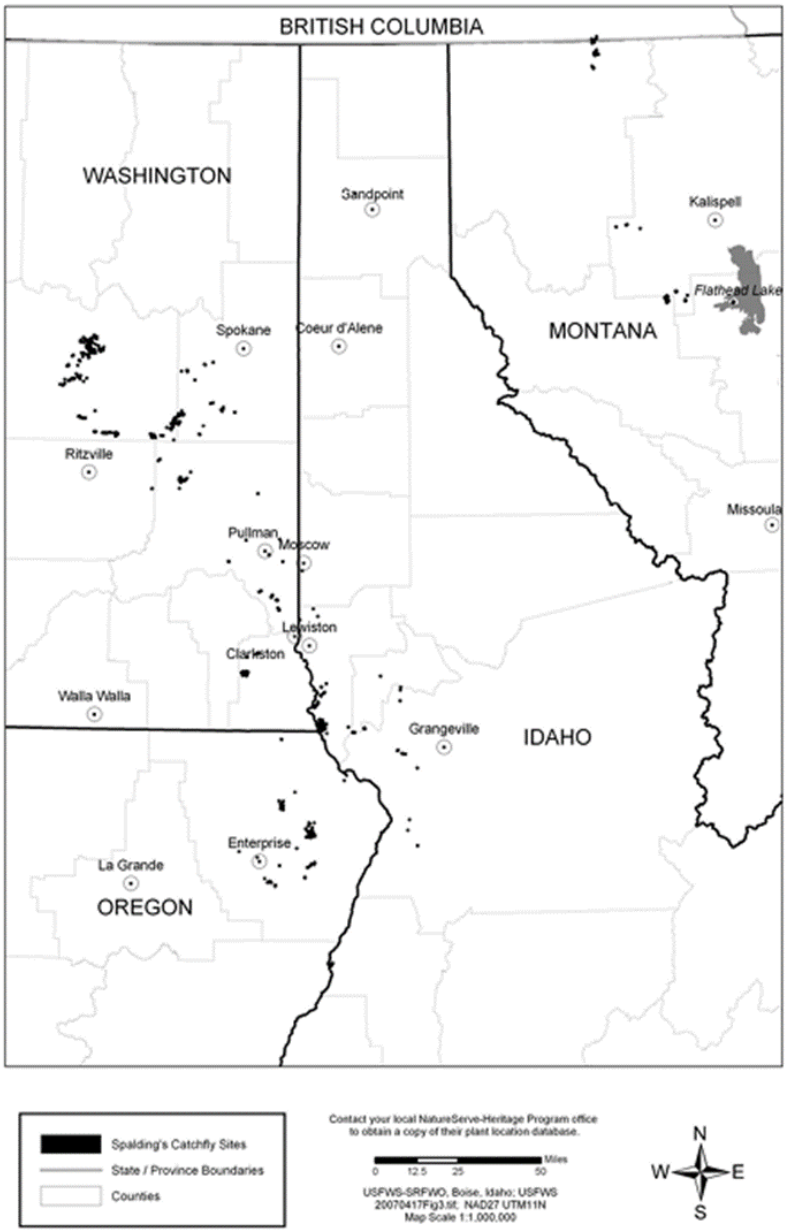

Figure 2-12. Distribution of Spalding's Catchfly (USFWS 2007).

Threats

Spalding's catchfly continues to be impacted by habitat loss due to human development and agriculture, habitat degradation associated with adverse grazing and trampling by domestic livestock, and invasions of aggressive nonnative plants. Other impacts include changes in fire frequency and seasonality, off-road vehicle use, and herbicide spraying and drift.

2.2.12 Whitebark Pine

Listing History

Whitebark pine was first reviewed as a candidate for listing October 26, 2011, and is now listed as threatened as of January 17, 2023.

Life History/Biological requirements

Whitebark pine is a slow-growing, long-lived tree with a life span of up to 500 years and sometimes more than 1,000 years. It's a hardy conifer that tolerates poor soils, steep slopes, and windy exposures and is found at alpine tree line and subalpine elevations throughout its range. It grows typically 16.4-65.6 ft (5 to 20 m) tall with a rounded or irregularly spreading crown shape under a wide range of precipitation amounts, from about 20.1 in (51 cm) to over 100 in (254 cm) per year. Whitebark pine may occur as a climax species, early successional species, or seral (mid-successional stage) co-dominant associated with other tree species. Although it occurs in pure or nearly pure stands at high elevations, it typically occurs in stands of mixed species in a variety of forest community types.

On higher density conifer sites, whitebark pine tends to grow as tall, single-stemmed trees, whereas on open, more exposed sites, it tends to have multiple stems. Above tree line, it grows in a krummholz form, with stunted, shrub-like growth caused by high winds and cold temperatures. This pine species is monoecious (with both male pollen and female seed cones on the same tree). Its characteristic dark brown to purple seed cones are 5 to 8 cm long and grow at the outer ends of upper branches.

Whitebark pine is one of five species of stone pine, so-named for their hard, stone-like seeds, and is the only stone pine that occurs in North America. Stone pines are distinguished from other pines by their five needles per cluster, indehiscent seed cones (scales on the cones remain essentially closed at maturity) that stay on the tree, and wingless seeds that remain fixed to the cone and cannot be dislodged by the wind. Because whitebark pine seeds cannot be wind-disseminated, primary seed dispersal occurs almost exclusively by Clark's nutcrackers (*Nucifraga columbiana*), birds in the taxonomic family Corvidae, which includes include ravens, crows, and jays. Consequently, Clark's nutcrackers facilitate whitebark pine regeneration and influence its distribution and population structure through their seed caching activities.

Distribution and Critical Habitat

No critical habitat has been designated for this species. Presently, whitebark pine occurs in scattered areas of the warm and dry Great Basin, but it typically occurs on cold and windy high-elevation or high-latitude sites in western North America. As a result, many stands are geographically isolated. Its range extends longitudinally between 107 and 128 degrees west and latitudinally between 27 and 55 degrees north. The distribution of whitebark pine includes coastal and Rocky Mountain ranges that are connected by scattered populations in northeastern Washington and southeastern British Columbia (Figure 2-13).

Figure 2-13. Whitebark Pine Range (USFWS 2021).

Threats

The primary threat to the species is from disease in the form of the nonnative white pine blister rust and its interaction with other threats. Continuing environmental effects resulting from climate change will result in direct habitat loss for whitebark pine, a high-elevation species occurring only in cool mountaintop habitats.) Past and ongoing fire suppression is also negatively impacting populations of whitebark pine through direct habitat loss. Many stands of trees once dominated by whitebark pine are now dense stands of shade-tolerant conifers. This change in forest structure and composition

facilitates an increased frequency and intensity of wildfire and an increased susceptibility to predation and disease.

2.2.13 Ute Ladies'-tresses

Listing History

Ute ladies'-tresses was listed as threatened on January 17, 1992.

Life History/Biological requirements

Ute ladies'-tresses is a perennial herb with erect, glandular-pubescent stems 5-24 in (12.7 to 61 cm) tall arising from tuberous-thickened roots. It reproduces exclusively by seed. The plant's life cycle consists of four main stages: seedling, dormant, vegetative, and reproductive. Fruits are produced in late August or September with seeds shed shortly thereafter. Seeds are microscopic, dust-like, and readily dispersed by wind or water. This plant may remain dormant for eight to eleven years and may revert to below ground existence for one to four or more growing seasons before re-emerging with new above-ground shoots.

The vegetative shoots are produced in October and persist through the winter as small rosettes. These resume growth in the spring and develop into short-stemmed, leafy plants. It blooms from early July to late October. Flowering typically occurs earlier in sites that have an open canopy and later in well-shaded sites. Bees are the primary pollinators of Ute ladies'-tresses, particularly solitary bees.

In perennial streamside populations Ute ladies'-tresses typically occur on shallow sandy loam, silty-loam, or clayey-silt alluvial soils overlying more permeable cobbles, gravels, and sediments.

Distribution and Critical Habitat

No critical habitat has been designated for this species. Populations of Ute ladies'-tresses orchids are known from three broad general areas of the interior western United States—near the base of the eastern slope of the Rocky Mountains in southeastern Wyoming and adjacent Nebraska and north-central and central Colorado; in the upper Colorado River basin, particularly in the Uinta Basin; and in the Bonneville Basin along the Wasatch Front and westward in the eastern Great Basin, north-central and western Utah, extreme eastern Nevada, and southeastern Idaho. The species is also known to occur in Bonneville, Fremont, Jefferson, and Madison counties along the Snake River, has been discovered in southwestern Montana, and in the Okanogan area and along the Columbia River in North Central Washington (Figure 2-14).

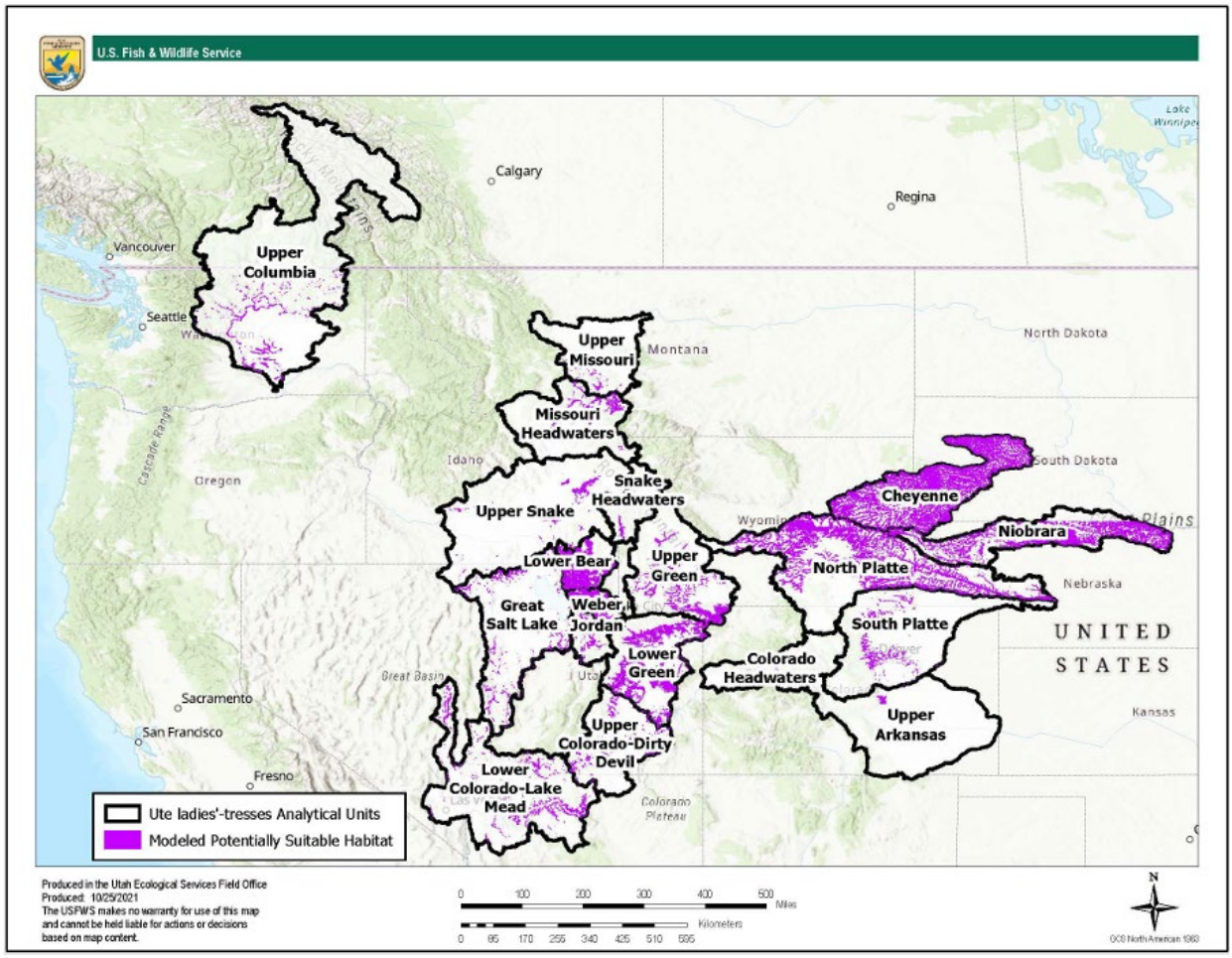

Figure 2-14. Ute ladies'-tresses range (USFWS 2023).

Threats

Alteration of suitable riparian and wetland habitat can affect Ute ladies'-tresses, though after listing, this plant was found in greater numbers than estimated at the time of listing. Current threats are drought caused reduction in water table and lake levels, competition from non-native plants, and grazing impacts.

2.3 NMFS SPECIES AND CRITICAL HABITAT STATUS

2.3.1 Upper Columbia River Spring Chinook

Listing History

The Upper Columbia River (UCR) spring Chinook salmon were listed as an endangered species on March 24, 1999, and their endangered status was reaffirmed on June 28, 2005.

explorer.natureserve.org

Distribution

The UCR spring-run Chinook Evolutionarily Significant Unit (ESU) includes all natural-origin, stream-type Chinook salmon originating from Columbia River tributaries upstream of Rock Island Dam and downstream of Chief Joseph Dam, excluding the Okanogan River subbasin (Figure 2-15).

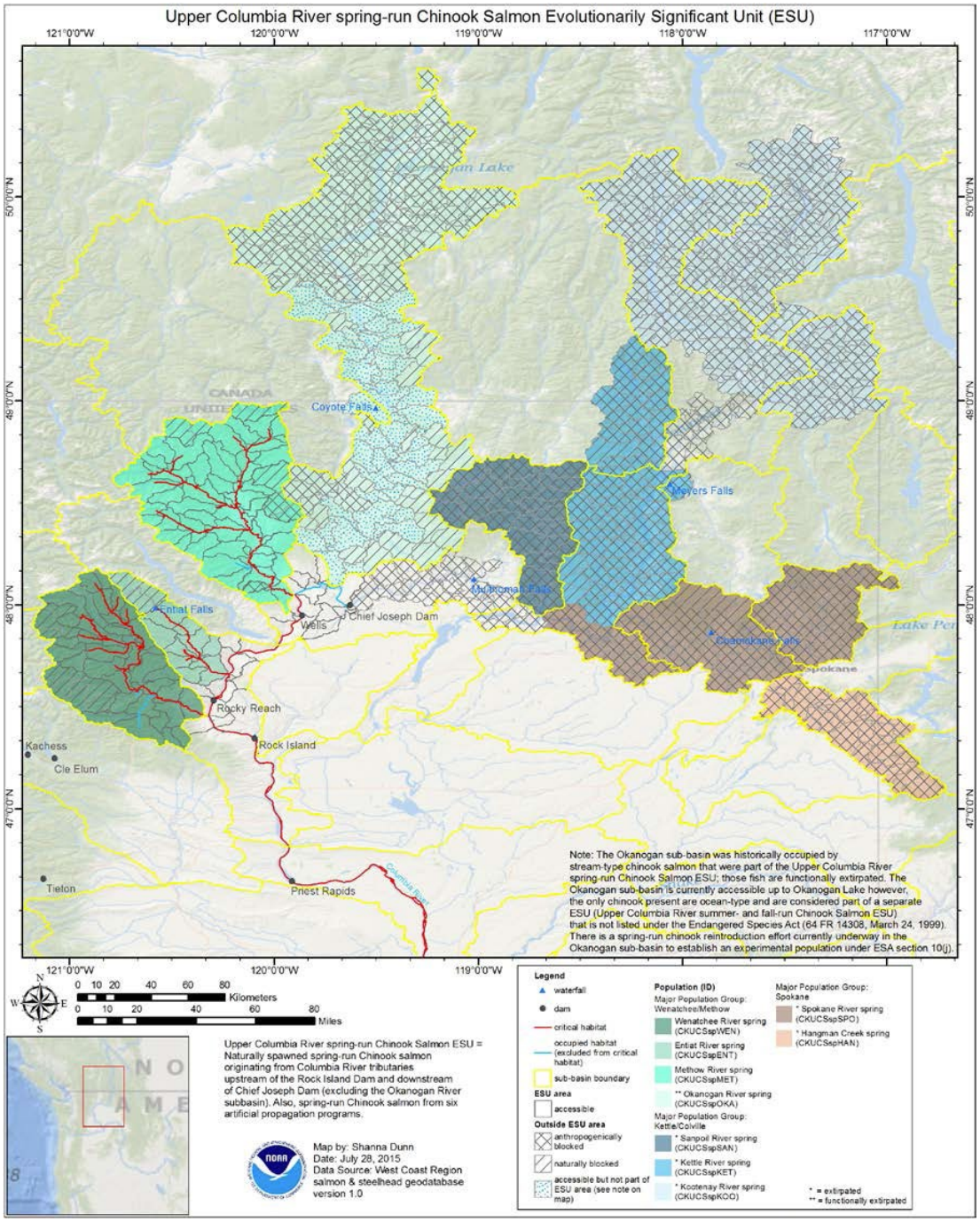

Figure 2-15. Upper Columbia River Spring Chinook Salmon Distribution

Six artificial supplementation programs also contribute to the Upper Columbia River spring Chinook salmon ESU: the Twisp River Program; Chewuch River Program; Methow Program; Winthrop National Fish Hatchery Program; Chiwawa River Program; and the White River (NMFS 2016a).

Life History and Biological Requirements

Migration timing and life stage development can be different between the strains as they migrate through and use the river. Upper Columbia River spring Chinook salmon biological requirements include food; high quality, flowing water; clean spawning substrate, resting habitat, and unimpeded migratory access to and from spawning and rearing areas.

Adults enter the rivers from mid-April through July, and hold in deep pools with cover until spawning, with spawning occurring from late July through September (Bugert et al. 1998). Spawning occurs in the Wenatchee, Entiat, and Methow watersheds at elevations from 500 to 1,500 meters (Myers et al. 1998). Spawners return to the Wenatchee River from late April through June, and to the Methow and Entiat Rivers from late May through July (Bugert et al. 1998). Adults would be passing the action area from mid-April to mid-June (Chelan County PUD No. 1 1998).

In the Wenatchee, Entiat, and Methow watersheds, fry emergence occurs from late March through early May, and juveniles usually remain in the subbasins through the summer (Bugert et al. 1998). The majority of juveniles out-migrate in their second spring, with the peak occurring from late April through May (Bugert et al. 1998). Multiple life-history strategies have been observed in the Methow and Wenatchee watersheds, ranging from spawning, rearing, and overwintering in the upper watershed, to spawning and rearing in the upper watershed and out-migrating (to the Columbia River) in fall/winter (Bugert et al. 1998). Although fewer than in the Methow and Wenatchee Rivers, multiple life-history strategies (five) have also been observed in the Entiat River. The pertinence of the multiple life-history strategy information to the proposed project is that juvenile Upper Columbia River spring Chinook could be in the Columbia River from winter through June, although it is highly improbable that they would be in the action area as pre-smolts.

Factors for Decline

Current pressures on Upper Columbia River spring Chinook salmon include loss of quality habitat, predation, poor ocean conditions and limited fishing pressure. The limited amount of suitable habitat available, caused by habitat degradation and passage barriers is the main factor limiting recovery.

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

NMFS designated critical habitat for Upper Columbia River Chinook salmon in the Chief Joseph, Methow, Upper Columbia/Entiat, and Wenatchee subbasins, and the Columbia River migration corridor (NMFS 2005) (Figure 2-16).

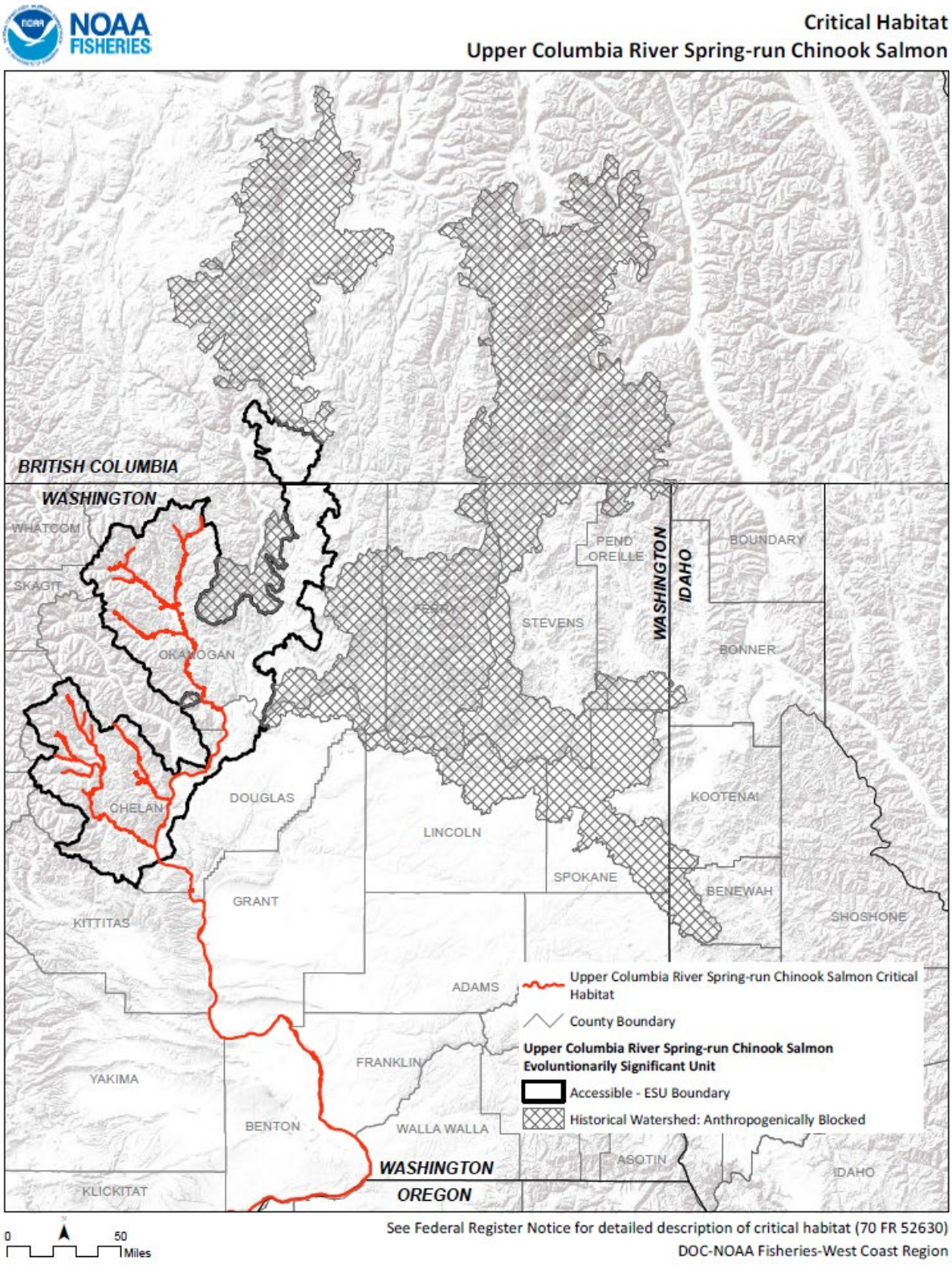

Figure 2-16. Upper Columbia River Spring Chinook Salmon Critical Habitat.

2.3.2 Upper Columbia River Steelhead

Listing History

Upper Columbia River (UCR) steelhead were listed as endangered in August 1997, changed to threatened in January 2006, then changed back to endangered by court decision in June 2007.

Distribution

The Upper Columbia River steelhead Distinct Population Segment (DPS) consists of naturally spawned anadromous steelhead produced in Columbia River tributary systems upstream of the Yakima River to the Canadian border (Figure 2-17). Also included are steelhead from six artificial propagation programs – the Wenatchee River, Wells Hatchery, Winthrop National Fish Hatchery, Omak Creek, and Ringold hatchery programs (NMFS 2016a).

Life History and Biological Requirements

Range-wide, UCR steelhead biological requirements include food, flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), clean spawning substrate and unimpeded migratory access (with resting areas) to and from spawning and rearing areas. Steelhead use the Columbia River mainly as a migration corridor. Habitat use in the mainstem Columbia River by steelhead is not well known. Unlike other salmonids, which tend to use a smaller portion of the available habitat at a higher density, steelhead tend to disperse widely throughout the available habitat.

Smolt outmigration past Rock Island Dam peaks in mid-May, but ranges from April to early July (Chelan County PUD No. 1 1998). Smolt outmigration past McNary Dam peaks in May, but ranges from April to early July (Griswold et al. 2005). However, periodically a juvenile UCR steelhead is observed passing McNary Dam as late as October (Griswold et al. 2005). Thus, smolt migration past the action area would generally range from April to early July.

Spawning in the Wenatchee, Entiat, and Methow Rivers occurs from late March through June, and fry emerge and disperse from late spring through August (Chelan County PUD No. 1 1998). UCR steelhead in the Methow River exhibit a wide range of life history types. Juveniles spend two to seven years rearing in headwater streams and/or the mainstem of each river, and some juveniles from any year class would be almost continually out-migrating during this period (Chelan County PUD No. 1 1998). Most smolts emigrate at age 2+ or age 3+ years.

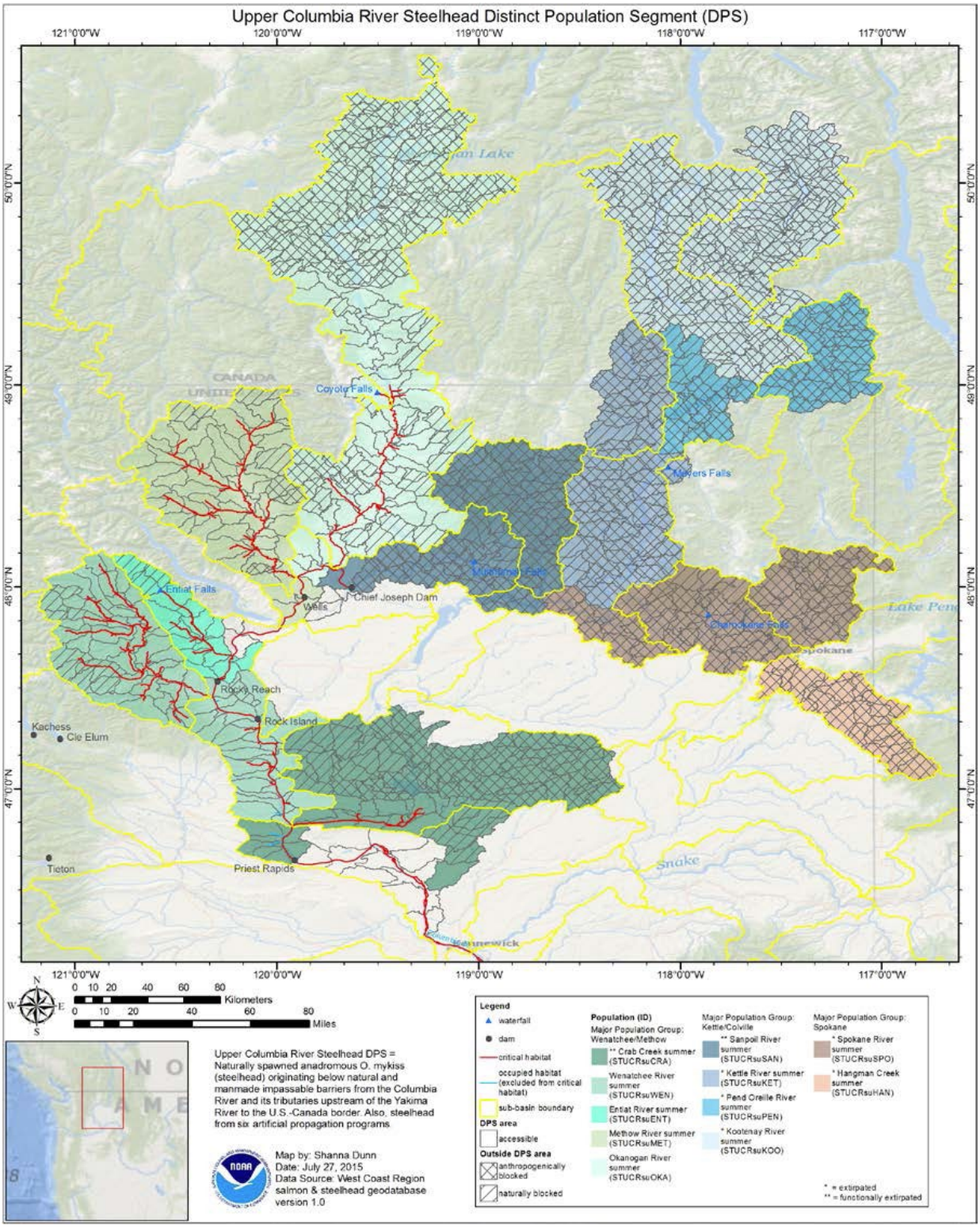

Figure 2-17. Upper Columbia River Steelhead Distribution.

Steelhead adults prefer temperatures between approximately 39.2 Fahrenheit (°F) and 48.2°F, respectively [4 degrees Centigrade (°C) and 9°C (Bell 1990)], but easily withstand temperatures between 50°F and 55.4°F (10°C and 13°C); the upper lethal limit for steelhead is 75°F [23.9°C (Spence et al. 1996)] (Table 2-2).

Table 2-2. The Steelhead Life History Timing and Thermal Requirements.

MCR Steelhead Mill Creek Population	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Temperature	Time	Lethal Limits
Upstream adult migration			P	P									0-20°C	After 1-4 years in ocean	0/23.9° C
Adult spawning													3.9-9.4°C		
Egg incubation													8.5-14°C	50-150 days	>17.5 C
Alevin															
Fry emergence															
Juvenile rearing													7.3-20°C	1-3 Avg 2 years	0/23.9° C
Downstream Kelts															
Downstream juvenile migration				P									<14.4°C		

P=Primary

Factors for Decline

Historic fishing pressure began the decline of salmon populations over 100 years ago. Construction of dams, roads, railroads, and levees/shoreline protection, as well as irrigation withdrawals has altered the rearing habitat of juvenile steelhead and the migratory habitat of juveniles and adults. Increased predation on juvenile salmonids due to the habitat changes is also a contributor to the declining salmonid population. Prior to the construction of Columbia River dams, a large percentage of the shoreline consisted of shallow water with a small particle size substrate. Today, much of the shoreline consists of deeper water bordered by riprap. This change in habitat type is likely a factor in the decline of the Columbia Basin steelhead populations.

Current pressures on Upper Columbia River steelhead include loss of quality habitat, predation, poor ocean conditions and limited fishing pressure. The limited amount of suitable habitat available, caused by habitat degradation and passage barriers is the main factor limiting recovery.

Ongoing Monitoring

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

Critical Habitat

NMFS designated critical habitat for UCR steelhead in the Chief Joseph, Okanogan River, Similkameen, Methow, Upper Columbia/Entiat, Wenatchee, Lower Crab, and Upper Columbia/Priest subbasins, and the Columbia River migration corridor (NMFS 2005) (Figure 2-18).

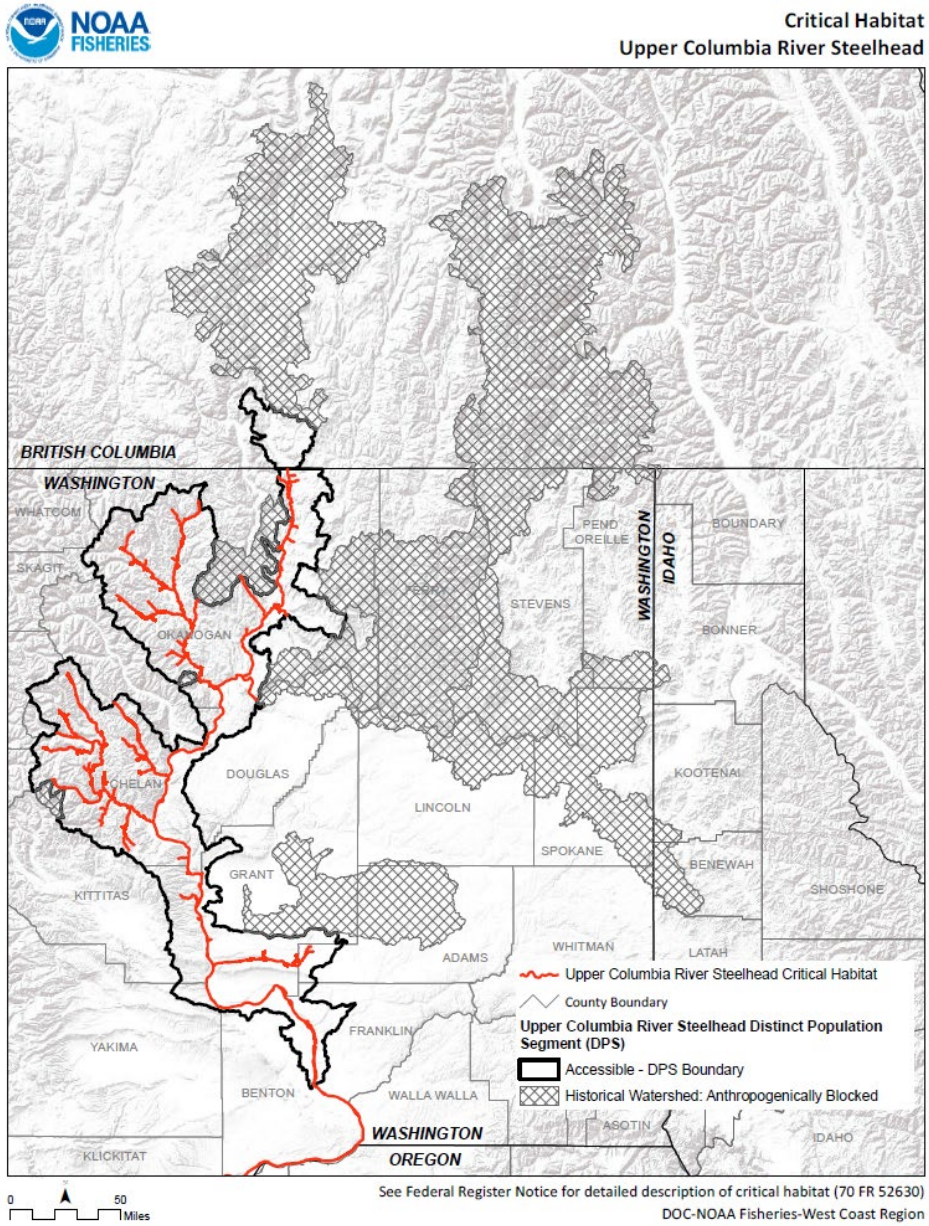

Figure 2-18. Upper Columbia River Steelhead Critical Habitat.

Essential elements of Pacific salmon and steelhead critical habitats are found in Table 2-3.

Unlike earlier critical habitat designations, which relied on the U.S. Geological Survey maps of subbasins and included “all accessible river reaches within the current range of

the listed species," the 2005 designations used a much finer, more specific scale in designating critical habitat for salmon and steelhead. The 2005 designations identify stream and near-shore habitat areas where listed salmon and steelhead have actually been observed, or where biologists with local area expertise presume they occur. These habitat areas are found within more than 800 watersheds in the Pacific Northwest and California.

Table 2-3. The Physical and Biological Features (PBF) of Critical Habitats Designated for Pacific Salmon and Steelhead Species.

Physical and Biological Features		
PBF	**Attribute**	**Species Life History Event**
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

SECTION 3 - ENVIRONMENTAL BASELINE

The ESA regulations were revised in late 2019 and included clarification on baseline. The baseline discussion in this section focuses primarily on habitat conditions for the ESA-listed fish since they would be most affected by the action.

Environmental baseline refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

3.1 HISTORIC CONDITIONS

Pre-English settlement, the western U.S. consisted of largely untouched forest and prairie ecosystems. Natural processes of flood, fire, wind, and wildlife grazing managed the natural ecosystems as they had adapted to over millennia. Species generally inhabited large ranges as habitat was un-fragmented and largely suitable. No northern pike were present in the action area.

3.2 CURRENT CONDITIONS

Presently, a variety of human disturbances such as mineral extraction, energy harnessing (wind and water), timber harvest, livestock grazing, recreation, and human development have and will likely continue to significantly alter the habitats of the ESA-listed species considered in this BA.

According to WDFW (No date), illegal stocking in the 1950s in Montana rivers and in the 1970s in the Coeur d'Alene river system led to establishment of northern pike in the upper Columbia River Basin, which have expanded downstream to include the Pend Oreille River, Spokane River, and the Columbia River upstream of Grand Coulee Dam. Several Tribes and state agencies in many areas are currently working to suppress the spread of northern pike.

3.3 CURRENT NORTHERN PIKE SUPPRESSION AND BYCATCH

This section summarizes the suppression efforts completed by tribes in the action area.

3.3.1 Washington – Lake Roosevelt

Northern pike, an aquatic invasive species in Washington State, were first recorded in standardized fisheries surveys in Lake Roosevelt in 2007 (Lee et al. 2010). Northern pike pose an immediate and direct threat to the Lake Roosevelt ecosystem, native fish communities and the hatchery rainbow trout (*Oncorhynchus mykiss*) fishery. Further expansion of northern pike in the Columbia River Basin threatens salmon and steelhead restoration projects, including fish listed under the ESA.

A pilot suppression and monitoring project was completed in 2015 and 2016 with the full program starting in 2017. During 2022, the Co-managers of Lake Roosevelt (CTCR, STOI and WDFW) implemented the Lake Roosevelt Northern Pike Suppression and Monitoring Plan (McLellan et al. 2018). Implementation of the plan requires multiple funding sources and includes monitoring, suppression, and public outreach objectives.

Confederated Tribes of the Colville Reservation Northern Pike Control Efforts in Lake Roosevelt

The CTCR Northern Pike gillnet suppression began on April 10, 2023 and ended on September 6, 2023. The CTCR also participated in the two fall reservoir wide gillnet monitoring surveys; the Fall Walleye Index Netting survey (FWIN) conducted between October 23-26 and the Fall Pike Survey conducted October 30-November 2. Overall, in 2023, the CTCR set 643 gillnets between Grand Coulee Dam (47.956553, -118.980985) and China Bend (48.812339, -117.948666). All of the sets were overnight sets. Overall, the effort was seasonally allocated with 55% occurring in the spring (March-May), 32% in the summer (June-August) and 12% in the fall (September and October). CTCR crews captured 6,359 fish, including 69 northern pike. Native fish comprised 13% of the total catch and 66% of those were released alive (Table 3-1).

The 2022 season of CTCR northern pike gillnet suppression began on March 16, 2022, and ended on November 3, 2022. The CTCR also participated in the two fall reservoir wide gillnet surveys; the Fall Walleye Index Netting survey (FWIN) conducted between October 24-26 and the Fall Pike Survey conducted October 31-November 3. In 2022, the CTCR set 868 gillnets between Grand Coulee Dam (47.953838, -118.982555) and Northport, WA (48.81095, -117.94593). All of the sets were overnight sets. Overall, the effort was seasonally allocated with 53% occurring in the spring (March-May), 35% in the summer (June-August) and 10% in the fall (September and October).

In Lake Roosevelt, 2022 CTCR crews captured 5,431 fish, including 236 northern pike. Native fish comprised 16% of the total catch and 57% of those were released alive (Table 3-1). White sturgeon (unlisted) and bull trout have been incidentally caught annually since 2018 with a yearly maximum of 29 mortalities and zero mortalities, respectively (Table 3-1; McLellan et al. 2023, McLellan et al. 2022, McLellan et al. 2021, Lee and Parsons 2020, McLellan et al. 2020; and McLellan et al. 2019).

Table 3-1 Northern pike captured with relevant bycatch during Lake Roosevelt Gillnet Suppression, 2018-2022.

Species	# Released	# Mortalities	Year
Northern Pike	0	69	2023
White Sturgeon*	25	3	2023
Bull Trout	0	0	2023
Chinook Salmon	2	2	2023
Kokanee - wild	9	11	2023
Redband Trout	35	63	2023
Rainbow Trout - hatchery	63	323	2023
Northern Pike	1	235	2022
White Sturgeon*	95	6	2022
Bull Trout	0	0	2022
Chinook Salmon	0	0	2022
Kokanee - wild	2	15	2022
Redband Trout	31	44	2022
Rainbow Trout - hatchery	49	190	2022
Northern Pike	0	366	2021
White Sturgeon*	8	0	2021
Bull Trout	0	0	2021
Chinook Salmon	0	0	2021
Kokanee - wild	4	2	2021
Redband Trout	28	57	2021
Rainbow Trout - hatchery	51	259	2021
Northern Pike	0	1031	2020
White Sturgeon*	23	2	2020
Bull Trout	0	0	2020
Chinook Salmon	0	1	2020
Kokanee - wild	2	21	2020
Redband Trout	18	48	2020
Rainbow Trout - hatchery	31	177	2020
Northern Pike	1	1965	2019
White Sturgeon*	48	1	2019
Bull Trout	0	0	2019
Chinook Salmon	0	0	2019
Kokanee - wild	0	6	2019
Redband Trout	20	41	2019

Rainbow Trout - hatchery	67	119	2019
Northern Pike	0	1438	2018
White Sturgeon*	134	29	2018
Bull Trout	0	0	2018
Chinook Salmon	0	1	2018
Kokanee - wild	0	4	2018
Redband Trout	38	86	2018
Rainbow Trout - hatchery	27	110	2018

* Unlisted white sturgeon. No Kootenai River white sturgeon present.

Colville tribe collected stomach samples from northern pike between March and October in 2022 (n=175) and April and July in 2023 (n=59). In 2022, 72% (n=127) of the stomach samples had contents and in 2023, 47% (n=28) had contents. Fish species were the primary diet item (47% by number and 56% by frequency of occurrence) with walleye being the most preyed upon fish in 2022 and 2023. However, rainbow trout were a close second in 2023. Rainbow trout were consumed in May and June, which coincided with the hatchery rainbow trout net pen releases that occur each spring (Jasper et al. 2023).

The Co-managers of Lake Roosevelt and regional partners continue to provide the public with information related to northern pike suppression and monitoring in the Upper Columbia River. The managers implement this task through social media information sharing on each agency's managed platforms, through local radio talk shows, publications, and signage posted at each boat launch on Lake Roosevelt and Rufus Woods reservoirs.

Spokane Tribe of Indians Northern Pike Control Efforts in Lake Roosevelt

The STOI generally set gillnets for northern pike suppression from March into November each year weather permitting.

The STOI Northern Pike gillnet suppression began on March 20 and ended on October 3, 2023. During this time, STOI set a total of 898 gillnets in Lake Roosevelt. There were 779 gillnets (set in between Seven Bays and China Bend) in the mainstem Lake Roosevelt and 119 gillnets in the Spokane Arm. STOI crews captured 11 northern pike in the Spokane Arm during suppression netting in 2023 and 223 in the mainstem of Lake Roosevelt from Hawk Creek to Northport.

STOI crews captured a total of 8,388 fish, including 234 northern pike (Table 3-2). The majority of northern pike were captured in the Castle Rock and Hunters areas.

Table 3-2. Key Fish Captured during Spokane Tribe of Indians Lake Roosevelt Gillnet Suppression, 2018-2022.

Species	# Released	# Mortalities	Year
Northern Pike	0	234	2023
White Sturgeon*	58	4	2023
Bull Trout	0	1	2023
Chinook Salmon	1	11	2023
Kokanee - wild	5	9	2023
Redband Trout	50	97	2023
Rainbow Trout - hatchery	185	592	2023
Northern Pike	0	282	2022
White Sturgeon*	17	1	2022
Bull Trout	0	0	2022
Chinook Salmon	1	1	2022
Kokanee - wild	9	6	2022
Redband Trout	62	45	2022
Rainbow Trout - hatchery	203	225	2022
Northern Pike	0	281	2021
White Sturgeon*	8	1	2021
Bull Trout	1	0	2021
Chinook Salmon	0	1	2021
Kokanee - wild	1	8	2021
Redband Trout	69	86	2021
Rainbow Trout - hatchery	203	278	2021
Northern Pike	0	843	2020
White Sturgeon*	8	0	2020
Bull Trout	0	1	2020
Chinook Salmon	0	0	2020
Kokanee - wild	3	15	2020
Redband Trout	55	76	2020
Rainbow Trout - hatchery	190	451	2020
Northern Pike	0	436	2019
White Sturgeon*	8	0	2019
Bull Trout	0	0	2019
Chinook Salmon	0	3	2019
Kokanee - wild	13	9	2019
Redband Trout	34	71	2019

Rainbow Trout - hatchery	80	171	2019
Northern Pike	N/A	398	2018
White Sturgeon*	N/A	N/A	2018
Bull Trout	N/A	N/A	2018
Chinook Salmon	N/A	N/A	2018
Kokanee - wild	N/A	N/A	2018
Redband Trout	N/A	N/A	2018
Rainbow Trout - hatchery	N/A	N/A	2018

* Unlisted white sturgeon. No Kootenai River white sturgeon present.

Over the last six years of suppression in Lake Roosevelt, the catch per unit effort for STOI's northern pike suppression efforts decreased from over six per net to 0.36 per net. During this time, STOI crews became better at finding and targeting northern pike with the help of their co-managers and came up with a good monitoring strategy to evaluate progress each year. STOI increased their efforts with electrofishing in 2023 from the previous couple years. These efforts have helped reduce the abundance of northern pike in the Lake Roosevelt system and have helped slow downstream expansion of this invasive predator. Education and outreach may need to be evaluated for efficacy after the decrease in harvest of northern pike in 2022 through STOI's creel catch. This could be an outlier, but continued monitoring of angler behavior surrounding northern pike is useful information in this effort.

3.3.2 Washington – Box Canyon and Boundary Reservoirs

Northern pike were first documented in Box Canyon Reservoir (BCR) of the Pend Oreille River in 2004. They were introduced through immigration from the Clark Fork system or illegal transport from nearby lakes or rivers, northern pike became firmly established in BCR between 2006-2010, growing exponentially from hundreds of fish to more than 5,500. Their rapid establishment and growth caused dramatic declines in native species and game fish managed by WDFW, Kalispel Natural Resources Department (KNRD), and the Idaho Department of Fish and Game (IDFG). Northern pike are a direct threat to recovery efforts for Westslope cutthroat trout and ESA listed bull trout. Northern pike also undermine the conservation and management of other native salmonids, minnows, suckers, and introduced game fish within the watershed. Moreover, northern pike pose a significant risk to the anadromous fisheries of the Columbia River and ESA recovery efforts as they emigrate and establish downstream populations.

Following extensive studies and evaluation efforts, the KNRD and WDFW proposed, (2011) and began to implement (2012), a suite of measures, including mechanical suppression, Washington State fishing regulation changes, declassification as a game fish, and encouraging harvest of northern pike. Mechanical suppression of the population, using gillnets, has occurred annually since 2012 in BCR and was expanded to include Boundary Reservoir in 2016.

The 2022 northern pike mechanical suppression effort in BCR was completed February 28 through April 21. A total of 814 northern pike (Table 3-3) were removed in 626 overnight gillnet sets during the suppression effort. The effort was assessed May 2 to May 5 during the annual Spring Pike Index Netting survey (SPIN). The 2022 SPIN survey caught 15 northern pike. Through 2022, a total of 19,430 northern pike have been removed from BCR through active suppression (Harvey et al. 2023). Although the project has been highly effective at reducing the abundance of northern pike in BCR, suppression efforts will continue in 2023 and beyond to both limit population rebound and further reduce the already depressed population.

Table 3-3. Summary Fish Captured during Kalispel Tribes Box Canyon and Boundary Reservoir Suppression Efforts and SPIN Surveys, 2018-2022.

Species	# Released in both reservoirs	# Mortalities Box Canyon	# Mortalities Boundary	Year
Northern Pike	0	829	4+	2022
White Sturgeon*	0	0	0	2022
Bull Trout	0	0	0	2022
Northern Pike	0	647	198	2021
White Sturgeon*	0	0	0	2021
Bull Trout	0	1	0	2021
Northern Pike	0	143	54	2020
White Sturgeon*	0	0	0	2020
Bull Trout	0	0	0	2020
Northern Pike	0	446	51	2019
White Sturgeon*	0	0	0	2019
Bull Trout	0	0	0	2019
Northern Pike	0	304	148	2018
White Sturgeon*	0	0	0	2018
Bull Trout	0	0	0	2018

*Unlisted white sturgeon. * No Kootenai River white sturgeon present.

Although the spawning segment of the northern pike population has been greatly reduced and recruitment continues to remain low, it is still imperative that suppression efforts continue, and the populations is closely monitored.

Since 2018, no white sturgeon have been incidentally caught and a total of one (1) bull trout have been incidentally caught in Box Canyon and Boundary Reservoir gillnet suppression efforts (Table 3-3).

3.3.3 Idaho – Coeur d'Alene Lake

Non-native fish suppression measures and stream habitat improvement projects have been implemented in the Coeur d'Alene Basin as part of an overall habitat restoration strategy administered and executed by the CDT's Fisheries Program to recover native

populations of westslope cutthroat trout (WCT) to sustainable, harvestable levels. Localized gillnetting efforts were introduced into Coeur d'Alene Lake in 2015 to suppress populations of non-native northern pike to increase survival rates of adfluvial life-stages of WCT.

A total of 5,474 northern pike have been removed by the suppression program, with 1,510 and 3,964 of the total removed from Windy Bay and the southern end of the lake, respectively. In Windy Bay, daily catch rates of northern pike during seasonal gillnetting efforts in 2020 and 2021 were reduced to levels below one (1) fish per net, the target objective for the suppression program. Moreover, an average catch rate of 1.2 northern pike per net was estimated during spring index netting in 2021, indicating a depressed northern pike population in Windy Bay (Firehammer and Vitale 2022).

In the southern end of the lake in 2021, average daily catch rates of northern pike were reduced to levels below one (1) fish per net at the end of spring netting in all but one of the major spawning locations. However, a mean catch rate of 5.75 northern pike per net was estimated for index netting that occurred at the onset of fall suppression efforts in the southern end in 2021, indicating that a sizeable northern pike population was still present, which could be attributed to numerical compensatory responses. Fall catch rates of northern pike were observed to decline by almost 75% and approached the threshold of 1 fish/net toward the end of netting efforts in 2021 in Chatcolet Lake, a primary high-density area in the southern end. Small northern pike less than 600 mm in length comprised a greater percentage of the catch in 2021 than in 2020 across both suppression locations, indicating that the suspension of gillnetting efforts in the spring of 2020 because of COVID restrictions likely contributed to elevated spawning success. Seasonal movements (described by radio-telemetry) and the size structure of the northern pike population in the southern end of the lake informed strategies that could increase the effectiveness of the suppression program. Species composition and mortality rates for fish captured in spring and fall suppression efforts in Windy Bay and the southern end of Coeur d'Alene Lake (Firehammer and Vitale 2022). The suppression efforts conducted in Coeur d'Alene Lake in 2022 removed 97 and 1,093 northern pike from Windy Bay and the southern end of the lake, respectively (Table 3-4).

Table 3-4. Summary of Northern Pike, White Sturgeon, and Bull Trout Captured during Coeur d'Alene Lake Gillnet Suppression 2018-2022.

Species	# Released	# Mortalities	Year
Northern Pike	0	1190	2022
White Sturgeon*	0	0	2022
Bull Trout	7	3	2022
Northern Pike	0	1921	2021
White Sturgeon*	0	0	2021
Bull Trout	5	3	2021
Chinook Salmon	0	0	2021
Northern Pike	0	718	2020
White Sturgeon*	0	0	2020

Bull Trout	0	0	2020
Northern Pike	0	1856	2019
White Sturgeon*	0	0	2019
Bull Trout	1	3	2019
Northern Pike	0	59	2018
White Sturgeon*	N/A	N/A	2018
Bull Trout	N/A	N/A	2018

* Unlisted white sturgeon. No Kootenai River white sturgeon present.

Since 2018, no white sturgeon (unlisted) have been incidentally caught and a total of 22 bull trout (0 to 10 in a given year) have been incidentally caught in the CDT's Coeur d'Alene Lake gillnet suppression efforts (Table 3-4).

3.3.4 Idaho – Kootenai River

Currently, there is no active northern pike suppression program by the Kootenai Tribe in the Kootenai River. Although, one was caught on the Kootenai River downstream of Copeland, Idaho, in a backwater area called Jerome Slough around river kilometer 183 (Genny Hoyle, email).

3.3.4.1 Washington – Okanogan River

Currently, there are no suppression actions in the Okanogan River; only eDNA sampling is done.

3.3.4.2 Washington – Columbia River

Currently, there are no suppression actions in the Columbia River between Grand Coulee Dam to Wells Dam, only eDNA sampling is done for monitoring.

3.4 STATUS OF BULL TROUT IN THE ACTION AREA

The action area includes portions of the Mid-Columbia and Columbia Headwaters recovery units, containing in total five core areas, one (1) research needs area, and 39 local bull trout populations (Figure 2-9). The action area includes bull trout spawning and rearing (SR) habitat and foraging, migration, and overwintering (FMO) habitat. Spawning and early rearing habitat is typically found in headwater areas (often road-less and on U.S. Forest Service lands) while main stem rivers provide FMO habitat.

As the proposed action is encompasses a large area across Northern Idaho and Northeastern Washington, the analysis presented in this PBA assesses bull trout baseline status at the core area level as opposed to the smaller, local population scale. The bull trout recovery plan identified a bull trout core area as the closest approximation of a biologically functioning unit for bull trout (USFWS 2015a, p.71). By definition, a core

area includes a combination of core habitat (i.e., habitat that could supply all elements for the long-term security of bull trout) and a core population (a group of one or more local bull trout populations that exist within core habitat). Core areas contain both spawning and early rearing habitat and foraging, migrating, and overwintering habitat. Core areas constitute the basic unit on which to gauge recovery (USFWS 2015, p. 71).

Based on the most recent status reviews (USFWS 2008; USFWS 2015a), historical habitat loss and fragmentation, interaction with nonnative species, and fish passage issues are widely regarded as the most significant primary threat factors affecting bull trout. The order of those threats and their potential synergistic effects vary greatly by core area and among local populations and is described in greater detail in the recovery unit implementation plans for each of the two recovery units in the action area: Mid-Columbia (USFWS 2015c) and Columbia Headwaters (2015d). In some core areas within their extant range, bull trout experience no major threats and maintain healthy populations throughout most or all available habitat; some bull trout core areas experience limited but significant threats, but still retain strong populations in most available habitat; and some continue to experience severe and systemic threats and harbor relatively small populations that have been reduced to a limited portion of available habitat.

Mid-Columbia Recovery Unit
The Mid-Columbia recovery unit (RU) is divided into four Geographic Regions across Idaho, Oregon, and Washington. This RU contains 24 core areas, 124 local populations, and one (1) research needs area. The action area is located in the South Salmo River core area and Northeastern Washington (formerly Eastern Washington) research needs area.

The Priest Lakes (5 local populations) and Lake Pend Oreille (20 local populations) core areas. The Priest Lakes core area has primary threats from upland/riparian management (riparian and instream degradation from legacy forest practices); and non-native fishes (lake trout predation and competition and brook trout hybridization and competition) (USFWS 2015 pp. D10 - D25). The Priest Lakes Core Area is approximately 89% public land (Federal and State). Index redd surveys in upper Priest Lake tributaries expected to maintain Bull Trout monitoring in core area in the future. Maintenance or improvement of future core area resiliency dependent on continued suppression Lake Trout netting in upper Priest Lake. Land use related habitat conditions have improved since listing. Would have to diminish in scenarios 4 and 5 to reduce resilience of core area. Future condition modeling projected a 34% loss of spawning and rearing habitat by 2071-2090 resulting in ~97 km remaining. However, modeling does not account for FMO habitat in Priest Lakes (USFWS 2024, H33).

Columbia Headwaters Recovery Unit
The Columbia Headwaters RU is divided into five geographic regions: Upper Clark Fork, Lower Clark Fork, Flathead, Kootenai, and Coeur d'Alene regions (USFWS 2015d). This RU contains 35 bull trout core areas; 15 of which are complex core areas as they represent larger interconnected habitats and 20 simple core areas as they are isolated

headwater lakes with single local populations. The action area is located in the Priest Lakes, Lake Pend Oreille, Kootenai River, and Coeur d'Alene Lake core areas.

The Idaho portion of the Lower Clark Fork Geographic Region contains the Priest Lakes (5 local populations) and Lake Pend Oreille (20 local populations) core areas. The Priest Lakes core area has primary threats from upland/riparian management (riparian and instream degradation from legacy forest practices); and non-native fishes (lake trout predation and competition and brook trout hybridization and competition) (USFWS 2015e, pp. D10 - D25). The USFWS 2008 5-year review (USFWS 2008, p. 33) found this core area was at high risk of extirpation. The IDFG trend data indicate that bull trout abundance in this core area is decreasing (Meyer et al. 2014, p. 207).

The Lake Pend Oreille core area has primary threats from upland/riparian land management (e.g., sediment from forest roads, logging and livestock grazing; loss of large woody debris; and pool reduction in FMO habitat and most SR tributaries); instream impacts (e.g., loss of large woody debris; pool reduction; increased sedimentation in some SR tributaries from transportation, flood control, and utility corridors along riparian corridors; and changes in hydrology, sedimentation, and passage issues from historic placer mining); water quality (e.g., high water temperatures in mainstem FMO habitat and lower reaches of most tributaries); connectivity impairment (e.g., FMO habitat is fragmented by Albeni Falls Dam and Box Canyon Dam); small population size (e.g., small population size and fragmentation is severely limiting bull trout survival and recovery in key SR tributaries in the lower drainage); and non-native fishes (e.g., predation by northern pike, smallmouth bass, walleye, brown trout, and lake trout in FMO habitat, and hybridization with brook trout in SR habitat). The USFWS 2008 5-year review (USFWS 2008, p. 33) found this core area was at potential risk of extirpation. The IDFG trend data indicate that bull trout abundance in this core area is stable (Meyer et al. 2014, p. 207).

The Kootenai River core area contains eight local populations. This core area has primary threats from upland/riparian land management (e.g., forest practices and use and management of transportation corridors); instream impacts (e.g., Libby dam impacts to FMO habitat); and non-native fishes (e.g., competition and hybridization with brook trout). The USFWS 2008 5-year review (USFWS 2008, p. 33) found this core area was at risk of extirpation. The IDFG trend data indicate that bull trout abundance in this core area is stable (Meyer et al. 2014, p. 207).

The Coeur d'Alene Lake core area contains five local populations. This core area has primary threats from poor water quality (e.g., temperature, metals, and dissolved oxygen); small population size (e.g., low population size and lack of replication of stable populations in the St. Joe River limits recovery potential); and non-native fishes (e.g., northern pike and smallmouth bass predation). The 5-year review (USFWS 2008, p. 34) found this core area was at high risk of extirpation, although IDFG trend data indicate that bull trout abundance in this core area is increasing (Meyer et al. 2014, p. 207).

3.5 STATUS OF BULL TROUT CRITICAL HABITAT IN THE ACTION AREA

The action area includes streams and lakes/reservoirs designated as critical habitat in northern Idaho and northeastern Washington. As the proposed action a large area across northern Idaho and northeastern Washington, the analysis presented in this PBA assesses baseline status at the critical habitat unit scale. The action area overlaps the following three critical habitat units. See 75 FR 63898 for detailed descriptions of each critical habitat unit (CHU). Figure 3-1 provides an index of the critical habitat units for bull trout.

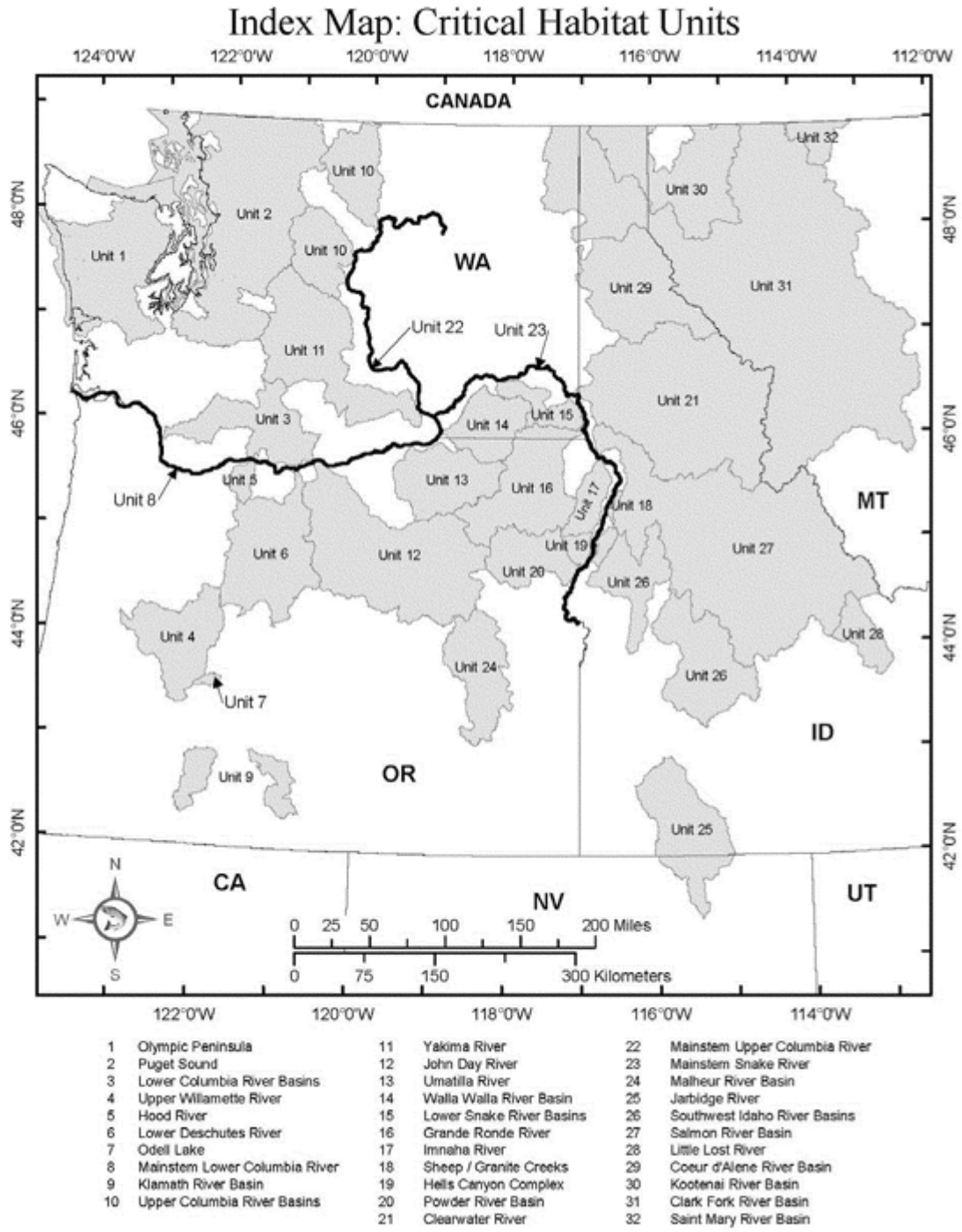

Figure 3-1. Critical habitat units of Bull Trout.

Coeur d'Alene River Basin (CHU 29)
Located in Kootenai, Shoshone, Benewah, Bonner, and Latah Counties in Idaho, the Coeur d'Alene River Basin CHU includes the entire Coeur d'Alene Lake basin in northern Idaho. A total of 510.5 miles of streams and 31,152.1 ac of lake surface area are designated as critical habitat. There are no subunits within the Coeur d'Alene River

Basin CHU. This unit provides spawning, rearing, foraging, migratory, connecting, and overwintering habitat.

Kootenai River Basin (CHU 30)
The Kootenai River Basin CHU is located in the northwestern corner of Montana and the northeastern tip of the Idaho panhandle and includes the Kootenai River watershed upstream and downstream of Libby Dam. The Kootenai River flows in a horseshoe configuration, entering the United States from British Columbia, Canada, and then traversing across northwest Montana and the northern Idaho panhandle before returning to British Columbia from Idaho where it eventually joins the upper Columbia River drainage. The Kootenai River Basin CHU includes two CHSUs: the downstream Kootenai River CHSU in Boundary County, Idaho, and Lincoln County, Montana, and the upstream Lake Koocanusa CHSU in Lincoln County, Montana. The entire Kootenai River Basin CHU includes 324.7 miles of streams and 29,873.0 ac of lake and reservoir surface area designated as critical habitat. The subunits within this unit provide spawning, rearing, foraging, migratory, connecting, and overwintering habitat.

Clark Fork River Basin (CHU 31)
The Clark Fork River Basin CHU includes the northeastern corner of Washington (Pend Oreille County), the panhandle portion of northern Idaho (Boundary, Bonner, and Kootenai Counties), and most of western Montana (Lincoln, Flathead, Sanders, Lake, Mineral, Missoula, Powell, Lewis and Clark, Ravalli, Granite, and Deer Lodge Counties). This unit includes 12 CHSUs, organized primarily on the basis of major watersheds: Lake Pend Oreille, Pend Oreille River, and lower Priest River (Lake Pend Oreille); Priest Lakes and Upper Priest River (Priest Lakes); Lower Clark Fork River; Middle Clark Fork River; Upper Clark Fork River; Flathead Lake, Flathead River, and Headwater Lakes (Flathead); Swan River and Lakes (Swan); Hungry Horse Reservoir, South Fork Flathead River, and Headwater Lakes (South Fork Flathead); Bitterroot River; Blackfoot River; Clearwater River and Lakes; and Rock Creek. The Clark Fork River Basin CHU includes 3,328.1 miles of streams and 295,586.6 ac of lakes and reservoirs designated as critical habitat. The subunits within this unit provide spawning, rearing, foraging, migratory, connecting, and overwintering habitat.

3.6 STATUS OF KOOTENAI RIVER WHITE STURGEON IN THE ACTION AREA

In 2014, a final report estimated that wild adult Kootenai sturgeon population abundance had declined from approximately 3,000 individuals in 1990 to 990 individuals (confidence interval 733-1,375) in 2011 (Beamesderfer et al. 2014a). Annual survival rates (estimated by the mark recapture analysis) appeared to have declined from “around 97 percent” prior to 2008 to 85 percent from 2007 to 2010. These latest estimates are the most current information available and constitute the best available science on the abundance and survival of wild adult Kootenai sturgeon (USFWS 2018).

However, the conservation aquaculture program has successfully supplemented the population by releasing over 275,000 juvenile sturgeon (~10,000 per yr) into the population since 1991. As conditions in the Kootenai basin improve due to ongoing and future management activities, we expect levels of natural recruitment to increase.

Average annual releases increased to approximately 34,000 juveniles with a mean weight of only 0.35 ounces. Then beginning in 2007, the focus returned to the strategy like 1999-2003 (average annual releases of approximately 12,500 age-1 juveniles).

3.7 STATUS OF UCR SPRING CHINOOK IN THE ACTION AREA

The UCR spring-run Chinook salmon ESU includes naturally spawned spring-run Chinook salmon originating from Columbia River tributaries upstream of the Rock Island Dam and downstream of Chief Joseph Dam (excluding the Okanogan River subbasin). This ESU also includes spring-run Chinook salmon from the following artificial propagation programs: the Twisp River Program, Methow Program, Winthrop National Fish Hatchery Program, Chiwawa River Program, Nason Creek Program, White River Program, and the Chief Joseph spring Chinook Hatchery Program (Okanogan release) (85 FR 81822). There is a single major population group (MPG), the North Cascades MPG, in this ESU. It is composed of three populations including the Wenatchee, Entiat, and Methow. The Okanogan population is considered extinct; however, NMFS designated a “non-essential experimental population” of spring-run Chinook salmon in the Okanogan River sub-basin under section 10(j) of the ESA in 2014 (79 FR 20802). The spring-run Chinook salmon that are designated as part of an experimental population are not included as part of the ESU. UCR Spring-run Chinook in the action area would be on the Columbia River between Wells Dam and Chief Joseph Dam (NMFS 2022).

3.8 STATUS OF UCR STEELHEAD IN THE ACTION AREA

The UCR steelhead DPS includes naturally spawned anadromous *O. mykiss* (steelhead) originating below natural and manmade impassable barriers from the Columbia River and its tributaries upstream of the Yakima River to the U.S.-Canada border. The DPS also includes steelhead from the following artificial propagation programs: the Wenatchee River Program, Wells Complex Hatchery Program (in the Methow), Winthrop National Fish Hatchery Program, Ringold Hatchery Program, and the Okanogan River Program (85 FR 81822). There is a single MPG, the North Cascades MPG, in this DPS. It is composed of four populations including the Wenatchee, Entiat, Methow, and Okanogan.

For the North Cascades MPG, there are four extant populations, Wenatchee River, Entiat River, Methow River, Okanogan River, and one functionally extirpated Crab Creek population. The Interior Columbia Technical Recovery Team (2007) recommended that three populations meet viability criteria, two of which meet high viability criteria for the ESU to be viable. The final UCSRB 2007 recovery plan adopted by NMFS recommended that all steelhead populations within the ESU, except the Crab Creek population, meet abundance/productivity criteria that represent a 5 percent extinction risk over a 100-year period as the recovery scenario.

Okanogan River Steelhead Populations

The Okanogan/Similkameen is the largest and most complex subbasin in the region. The Interior Columbia Technical Recovery Team identified 10 major and 24 minor spawning areas for the Okanogan summer steelhead population. However, only two major and five minor spawning areas are within the U.S. portion of the subbasin. Thirteen watersheds see regular use by spawning summer steelhead (Loup Loup, Omak, Salmon, Johnson, Bonaparte, Antione, Tonasket and Ninemile Creeks). The mainstem Okanogan and Similkameen Rivers are regularly used by hatchery summer steelhead for spawning, but their offspring rarely contribute to natural origin returns due to poor incubation success from rapidly warming spring water temperatures (Okanogan River) and bed scouring (Similkameen River; NMFS 2022)

In the Okanogan River Basin warm summer temperatures push restoration priorities into tributary streams that provide cooler stream temperatures. Barriers, fine sediments, poor water quality, and low late-summer instream flows (mainstem and tributary) historically limited the survival, distribution, and productivity of steelhead, and continue to do so today. The habitat concerns since the previous 2016 5-year review remain essentially unchanged. However, the importance of cold water refugia for steelhead in the Okanogan River and its tributaries has become more pronounced. Transboundary planning and implementation are ongoing and critical because more than half of the subbasin is within British Columbia, although, in recent years the majority of summer steelhead are produced in the United States portion of this subbasin (NMFS 2022).

SECTION 4 - 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 PBFs of critical habitat.

Due to the nature, spatial location, and timing of the proposed actions and similarities of effect pathways on fish, effects to bull trout, Kootenai River white sturgeon, UCR steelhead, and UCR spring-run Chinook are evaluated together and include potential effects from monitoring and suppression activities.

There will be no effects from eradication actions as they would only be used in waters with no ESA-listed aquatic species.

There will be no effects from public outreach or coordination activities due to their administrative nature and spatial separation from listed species.

There will be no effects from drawdown surveys because surveys would occur in dewatered areas created because of standard (baseline) reservoir drawdowns conducted for operational purposes not related to the survey (e.g., reducing reservoir elevation in preparation for a spring freshet).

There will be no effects to non-aquatic listed species as they are spatially separated from all actions in the proposed action (Table 4-1) that target northern pike, so the likelihood of interaction is zero.

Table 4-1. Non-Aquatic listed species spatially separated from the proposed actions of northern pike suppression.

Species	Species Determination
Canada Lynx	No Effect
Gray Wolf	No Effect
Grizzly Bear	No Effect
North American Wolverine	No Effect
Pygmy Rabbit	No Effect
Southern Mountain Caribou	No Effect
Mt. Rainier White-tailed Ptarmigan	No Effect
Yellow-billed Cuckoo	No Effect
Monarch Butterfly	No Effect
Spalding’s Catchfly	No Effect
Ute Ladies’-tresses	No Effect
Whitebark Pine	No Effect

The primary pathways for adverse and beneficial effects include:

- Disturbance

- Direct injury and mortality
- Predation
- Elevated turbidity

The discussion of each of these effects pathways are discussed below. Unavoidable temporary impacts to ESA-listed species and critical habitat are expected; however, implementation of the Program is a conservation measure within itself (northern pike suppression). While there would be localized adverse impacts to ESA-listed species and critical habitat via treatments, allowing northern pike to spread more into waters of the western United States without taking action risks region-wide ecological collapse of keystone endangered species and threatens to endanger populations of other stable aquatic species.

4.1.1 Disturbance

Effects to listed aquatic species from monitoring and suppression actions may include disturbance.

Noise from placement and operation of suppression gear, operation of boats, eDNA collection activities (monitoring), telemetry (monitoring) and human presence may disturb fish in the immediate vicinity of activities causing short-term displacement. Popper et al. (2003, entire) and Wysocki et al. (2007, entire) discussed potential impacts to fish from long-term exposure to anthropogenic sounds, predominately air blasts and aquaculture equipment, respectively. Popper et al. (2003, entire) identified possible effects on fish including temporary and potentially permanent hearing loss (via sensory hair cell damage) and masking of potentially biologically important sounds. Studies evaluated noise levels ranging from 115 to 190 decibels (dB). Wysocki et al. (2007, p. 691) did not identify any adverse impacts on rainbow trout from prolonged exposure to three sound treatments common in aquaculture environments (i.e., 115, 130, and 150 dB). Fish that experienced ear damage were caged (Popper et al. 2003, pp. 37-38) and thus incapable of moving away from the disturbance. Bull trout and Kootenai River white sturgeon will not be confined in the project area and thus will be free to move away from any short or prolonged noise.

Highest noise levels for any activities would be associated with boat use. Per Idaho and Washington Statutes (Title 67, Chapter 70, Section 67-7038.3[a-b] and Title 79A, Chapter 79A.60, Section 79A.60.130, respectively), boat noise levels cannot exceed 88 dB to 90 dB (dependent on the manufactured date), which is well below noise levels known to have generated adverse effects to surrogate fish species. Therefore, noise related disturbances of Program actions are unlikely to result in injury or death. It is unknown if the expected decibel levels will cause fish to temporarily move away from the disturbance or if fish will remain present. Undisturbed habitat would likely be a short distance away from where heavy equipment disturbances occur, and the disturbances would only occur a few hours a day during equipment operation. We do not anticipate that short-term movements caused by boats or noise from other activities will result in effects different than those that bull trout typically experience under baseline conditions.

The expected noise levels and level of disturbance for monitoring actions (eDNA and telemetry) will be minimal and insignificant. The expected noise levels and level of disturbance for suppression actions may affect, but are not likely to adversely affect ESA-listed steelhead, Chinook, sturgeon, and bull trout.

4.1.2 Direct Injury or Mortality

Effects to listed aquatic species from suppression actions may include direct injury or mortality.

Direct injury or mortality from suppression actions on bull trout, Kootenai River white sturgeon, UCR Steelhead, and UCR Spring Chinook are expected to result from physical interactions with the various gear available to be used.

With gillnetting, It is possible that a bull trout or Kootenai River white sturgeon could become briefly entangled but work itself free of the net if lightly entangled (e.g., loosely gilled depending on mesh and fish size). We expect fish temporarily entangled would not suffer any long-term effects due to the short duration of entanglement (i.e., not leading to mortality). However, the likelihood is low that temporary entanglements will occur. Conversely, we expect any bull trout or white sturgeon that becomes entangled (e.g., gilled or wrapped and anchored to net) would not be able to free itself and would perish.

The effects of electrofishing have been discussed in detail in a variety of publications and include bruising, petechial hemorrhaging, spinal damage, and mortality. When improperly employed, electrofishing can be quite harmful. As discussed in the Proposed Action section of this document, the guidelines and protocols identified in Reynolds (2012) would be implemented during electrofishing to reduce or eliminate injury and mortality. Aside from the effects of electrofishing, the increased handling required to salvage fish would cause additional stress.

Given the effects of electrical current are positively correlated with body mass (Reynolds 1996), the stress of disruption or injury to adult fish would be sublethal to lethal.

Hook and line are more targeted with specific lures that draw out northern pike so it is unlikely that bull trout and white sturgeon will be caught using this technique. If nontarget fish were caught they would be released immediately.

Estimated Magnitude of Effects

CMs will minimize but not eliminate the potential for injury or mortality related adverse effects bycatch and mortality of bull trout from ongoing efforts are lowest of zero caught a year at some areas and highest in Coeur d'Alene Lake totaling 22 (13 released, 9 mortalities) total from 2018-2022 which is around 2 mortalities a year with 60% released alive. Bycatch and mortality is estimated by looking at the white sturgeon bycatch (as a surrogate) in Lake Roosevelt from ongoing efforts are lowest of zero caught historically at some areas and highest Lake Roosevelt totaling 374 total (333 released 41

mortalities) from 2018-2022 which is around 8 mortalities a year or 90 percent released alive.

Although only eDNA efforts take place currently in the Columbia River from Grand Coulee to Wells Dam and in the Okanagan River; bycatch of Chinook and rainbow trout has recorded in Lake Roosevelt (just upriver) going back to 2018. USACE estimates the bycatch of UCR steelhead (should netting of northern pike start after a discovery) be like historical catch numbers of rainbow trout and Redband trout catch levels (Table 3-1) which total 1975 from 2018-2023. USACE estimates bycatch of UCR Chinook should be similar to historical catch numbers of Chinook salmon (2018-2023 total 6) and at maximum Kokanee (2018-2023 total 76) in Table 3-1.

Suppression actions may affect, and are likely to adversely affect ESA-listed steelhead, Chinook, sturgeon, and bull trout.

4.1.3 Predation

Indirect adverse effects to UCR spring-run Chinook, UCR steelhead, bull trout, and Kootenai white sturgeon from suppression actions may include increased susceptibility to predation. If bull trout and Kootenai white sturgeon encounter and avoid the nets and electrofishing, increased stress associated with the encounter can temporarily increase their susceptibility to predation from fishes like northern pike.

Conversely, removal of northern pike through suppression activities would reduce the existing predatory fish community, in some cases substantially, which will benefit the associated local steelhead, Chinook, bull trout, and Kootenai River white sturgeon populations.

In general, fish predation on both juvenile UCR spring-run Chinook salmon and UCR steelhead contribute to lower survival rates in tributaries to the Columbia River and during their outmigration in the Columbia River. Managing fish predators is one way to increase juvenile salmon and steelhead survival, but to what extent is not known (NMFS 2022).

4.1.4 Elevated Turbidity

Fish exposed to elevated turbidity levels during suppression netting activities that disturb sediments may be temporarily displaced from preferred habitat or could potentially exhibit sublethal responses such as gill flaring, coughing, avoidance, and increases in blood sugar levels, indicating some level of stress (Bisson and Bilby 1982, p. 372; Berg and Northcote 1985, p. 1410; Servizi and Martens 1987, p. 254). The most critical aspects of sediment-related effects are timing, duration, intensity, and frequency of increased turbidity exposure (Bash et al. 2001, p. 11).

Only small amounts of sediment will infrequently and inadvertently be introduced to the stream channel during netting activities. ***The expected increased turbidity levels and level of sediment disturbance and corresponding species displacement will be***

minimal and insignificant. Therefore, changes in turbidity may affect, but are not likely to adversely affect, ESA-listed steelhead, Chinook, sturgeon, and bull trout.

4.2 EFFECTS ON CRITICAL HABITAT

In this section, the proposed project effects to critical habitat are determined by analyzing the effects to each of the PBFs of critical habitat. We analyze the expected impacts from the proposed action at the stream and watershed scales.

Non-aquatic listed species (Table 4-2) critical habitat would not be located where proposed actions would be taking place therefore there would be no effect on their critical habitat.

Table 4-2. Effects on Critical Habitat

Species	Critical Habitat Determination
Canada Lynx	No Effect
Gray Wolf	No Effect
Grizzly Bear	No Effect
North American Wolverine	No Effect
Pygmy Rabbit	No Effect
Southern Mountain Caribou	No Effect
Mt. Rainier White-tailed Ptarmigan	No Effect
Yellow-billed Cuckoo	No Effect
Spalding's Catchfly	No Effect
Ute Ladies'-tresses	No Effect
Whitebark Pine	No Effect

Each individual proposed action, completed as proposed with full application of relevant CMs, is likely to have the following effects on critical habitat PBFs. The particular suite of effects caused by each proposed action will vary, depending on the scope of the project. Similarly, the intensity of each effect, in terms of change in the PBF from baseline condition, and severity of each effect, measured as recovery time, will vary somewhat between projects because of differences in the scope of the work. However, no proposed action is likely to have any effect on PBFs that is greater than the full range of effects summarized here.

Effects to the Physical and Biological Features of anadromous fish critical habitat is presented in Table 4-3.

Table 4-3. Effects of the Proposed Action to PBFs of Critical Habitat for Anadromous Fishes and Their Corresponding Species Life History Events.

Physical and Biological Features – Anadromous Fish		
PBF	**Attribute**	**Effect Determination**
Freshwater spawning	Substrate Water quality Water quantity	NLAA--temporary, minor effects on migration habitat will occur during gillnetting that creates intermittent physical impediment conditions. There will be no measurable effect on migration habitat.
Freshwater rearing	Floodplain connectivity Forage Natural cover Water quality Water quantity	NLAA– temporary, minor effects on migration habitat will occur during gillnetting that creates intermittent physical impediment conditions. There will be no measurable effect on migration habitat.
Freshwater migration	Free of artificial obstructions Natural cover Water quality Water quantity	NLAA – temporary, minor effects on migration habitat will occur during gillnetting that creates intermittent physical impediment conditions. There will be no measurable effect on migration habitat.
Estuarine areas	Forage Free of obstruction Natural cover Salinity Water quality Water quantity	No Effect – Spatially separated from the proposed action.
Nearshore marine areas	Forage Free of obstruction Natural cover Water quantity Water quality	No Effect – Spatially separated from the proposed action.
Offshore marine areas	Forage Water quality	No Effect – Spatially separated from the proposed action.

* NLAA = Not Likely to Adversely Affect

Effects to the physical and biological features of bull trout critical habitat are presented in Table 4-4, and the equivalent for white sturgeon is presented in Table 4-5.

USFWS regulations state that Federal agencies must consider those PBFs that are essential to the conservation of a given species (FR vol.71, no.229, 69060). The PBFs determined to be essential to the conservation of bull trout as stated by USFWS (FR vol.71, no.229, 69060) are shown in Table 4-4.

Table 4-4. Effects Determinations for the Proposed Action to the PBFs for Bull Trout.

PBFs	Attributes	Effect Determination
Water Quality	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.	No Effect– No change in water quality will result from the proposed action.
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.	NLAA – temporary, minor effects on migration habitat will occur during gillnetting that creates intermittent physical impediment conditions. There will be no measurable effect on migration habitat.
Food Availability	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	NLAA – A minor decrease in abundance of forage fish may occur as a result of gillnetting; however, there will be no measurable effect on food availability.
Instream Habitat	Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.	No Effect – No change in instream habitat will result from the proposed action.
Water Temperature	Water temperatures ranging from 2°C to 15°C (36°F to 59°F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading (provided by riparian habitat); streamflow; and local groundwater influence.	No Effect – No change in water temperature will result from the proposed action.
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.	NLAA – Netting activities over substrate containing fines may result in instances of disturbed sediments and temporary turbidity increases. Increased turbidity would generally redeposit within the vicinity of the treatment area and there will be no measurable effect on substrate.

The latest Kootenai River white sturgeon designated critical habitat (DCH) PBFs (formerly Primary Constituent Elements (PCEs) focus on spawning and rearing life

history stages, including spawning site selection, and survival of embryos and free-embryos (i.e., post-hatch embryos). The latter two are the life stages now identified as limiting the reproduction and numbers of the Kootenai River white sturgeon. Table 4-5 lists the five PBFs (73 FR 39505; 7/9/2008) specific to the conservation of Kootenai River white sturgeon DCH:

Table 4-5. Effects Determinations for the Proposed Action to the PBFs for Kootenai River White Sturgeon.

PBFs	Attributes	Effect Determination
Water Depth	A flow regime, during the spawning season of May through June, that approximates natural variable conditions and is capable of producing depths of 23 ft (7 m) or greater when natural conditions (for example, weather patterns, water year) allow. The depths must occur at multiple sites throughout, but not uniformly within, the Kootenai River DCH.	No Effect – No change in water depths will result from the proposed action.
Water Velocity	A flow regime, during the spawning season of May through June, that approximates natural variable conditions and is capable of producing mean water column velocities of 3.3 ft/s (1.0 m/s) or greater when natural conditions (for example, weather patterns, water year) allow. The velocities must occur at multiple sites throughout, but not uniformly within, the Kootenai River DCH.	NLAA – Gillnetting may result in minor, localized changes in water velocities at the interface of the net. There will be no measurable effect on mean water column velocities.
Water Temperature	During the spawning season of May through June, water temperatures between 47.3 and 53.6 °F (8.5 and 12 °C), with no more than a 3.6 °F (2.1 °C) fluctuation in temperature within a 24-hour period, as measured at Bonners Ferry.	No Effect – No change in water temperature will result from the proposed action
Substrate Type	Submerged rocky substrates in approximately 5 continuous river miles (8 river kilometers) to provide for natural free embryo redistribution behavior and downstream movement.	NLAA – Netting activities over substrate containing fines may result in instances of disturbed sediments and minor, temporary turbidity increases. Minor turbidity increases would generally redeposit within the vicinity of the disturbance area and there will be no measurable effect on substrate type.
Substrate for Eggs	A flow regime that limits sediment deposition and maintains appropriate rocky substrate and inter-gravel spaces for sturgeon egg adhesion, incubation, escape cover, and free embryo development. Note: the flow regime described above under PCEs 1 and 2 should be sufficient to achieve these conditions. 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.	NLAA – Netting activities over substrate containing fines may result in instances of disturbed sediments and minor, temporary turbidity increases. Minor turbidity increases would generally redeposit within the vicinity of the disturbance area and there will be no measurable effect on substrate for eggs.

4.3 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 and are not subject to ESA consultation (50 Code of Federal Regulations [CFR] 402.02).

The action area is already impacted from year-round recreation activities (fishing, hunting, boating, bird watching, swimming, etc.), commercial navigation, railroad, and highway transportation, shoreline private and commercial land use and business operations, and flood risk management structures and activities.

Over the life of the program the northern pike population is expected to be suppressed in the action area leading to additional forage fish for the ESA-listed fish species in the action area as well as less predation pressure from northern pike which can lead to increase in fish numbers.

4.4 SUMMARY OF EFFECTS DETERMINATIONS

Table 4-6 summarizes the determinations of effects reached in Section 4.

Table 4-6. Summary of Effects to Listed Species and Critical Habitats.

Species	Species Determination	Critical Habitat Determination
Canada Lynx	No Effect	No Effect
Gray Wolf	No Effect	No Effect
Grizzly Bear	No Effect	No Effect
North American Wolverine	No Effect	No Effect
Pygmy Rabbit	No Effect	No Effect
Southern Mountain Caribou	No Effect	No Effect
Mt. Rainier White-tailed Ptarmigan	No Effect	No Effect
Yellow-billed Cuckoo	No Effect	No Effect
Bull Trout	May Affect, Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect
Kootenai River White Sturgeon	May Affect, Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect
Spalding’s Catchfly	No Effect	No Effect
Ute Ladies’-tresses	No Effect	No Effect
Whitebark Pine	No Effect	No Effect
UCR Chinook Salmon	May Affect, Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect

UCR Steelhead	May Affect, Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect

SECTION 5 - MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976, AS AMENDED

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). Section 305(b) also requires NMFS to recommend measures that may be taken by the action agency to conserve EFH.

The Pacific Fishery Management Council (PFMC) designated EFH for Chinook salmon, Coho salmon, and Puget Sound pink salmon (Pacific Fishery Management Council, 1999).

The action area does not include areas designated as EFH under the MSA. Therefore, USACE has determined that the proposed action will result in **no adverse effect to EFH and no EFH consultation is required**.

SECTION 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 project is not a federally constructed, permitted, or licensed water development project and would not involve impounding, diverting, or controlling of waters. ***Therefore, coordination on the proposed action under the FWCA is not required.***

SECTION 7 - 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 without prior authorization by the Department of Interior U.S. Fish and Wildlife Service. 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. No trees or shrubs that could contain nests would be removed as a result of the proposed action, nor would there be any direct take of any bird. ***Therefore, the proposed action would not result in take of migratory birds.***

Section 8 - 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 the action area. While all nest sites have not been documented, locations of some are known. Bald eagles can be found roosting and hunting along the Columbia, Yakima, and Pend Oreille Rivers. In most cases, eagle nests are not located directly on the riverbank, but offset where mature trees provide adequate structure and protection (B. Trumbo, personal communication, 21 March 2018).

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.

Roosting or foraging eagles may be present in the action area during the proposed work windows; however, northern pike treatment activities are not expected to adversely affect eagles or disturb forage activities. Eagles that may occupy the area frequently are most likely accustomed to the daily activities and related noise levels generated by hydropower dams, commercial navigation, and recreational watercraft, etc. Activity-related noise would be short-term, and work would not impact eagle nesting sites. In addition, suitable foraging and roosting habitat is available in adjacent areas. When necessary, the treating agencies would implement the 330/660-foot buffers.

Because the proposed actions would not disturb nesting sites, eagles are likely accustomed to the operation watercraft, and because there are ample alternative roosting or foraging sites in the Project area, ***USACE has determined there would be no take of eagles as a result of the proposed action.***

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APPENDIX A - ANNUAL NORTHERN PIKE WORK PLAN NOTIFICATION FORM

Northern Pike Programmatic
Annual Work Plan Notification Form

Submit this completed annual action notification form with the following information to USACE.

USACE Review and Approval. All actions must be individually reviewed and approved by USACE as consistent with USFWS opinions before that action is authorized. USACE will notify within 7-14 calendar days if the action is approved or disqualified.

DATE OF REQUEST: _____ **USFWS & NMFS Tracking #:** _____

_____

Statutory Authority: ☐ ESA ONLY ☐ EFH ONLY ☐ ESA & EFH INTEGRATED

Lead Action Agency: **USACE**

Action Agency Contact: _____

Applicant: _____

Action Title: _____

6th Field HUC & Name: _____

Latitude & Longitude (including degrees, minutes, and seconds) _____

Proposed Project: ***Start Date:*** _____ ***End Date:*** _____

Action Description:

Include all actions needed (Monitoring, Supression, Drawdown Surveying, Public Outreach, Coordination, Reporting, etc.) either here or in an attached annual work plan.
Identify actions on a map.
Report a schedule of actions for the year.
Identify weekly bycatch thresholds
Applicable conservation measures

ESA-listed Species/Critical Habitat Present in Action Area:
Identify the species found in the action area:
Species:

☐ Bull Trout
☐ Kootenai White Sturgeon
☐ Upper Columbia River Spring Chinook
☐ Upper Columbia River Steelhead

Terms and Conditions:
Check the Terms and Conditions from the biological opinion that will be included as conditions on the permit issued for this proposed action. Please attach the appropriate plan(s) for this proposed action.