US Army Corps
of Engineers®
Walla Walla District

DRAFT INTEGRATED LETTER REPORT AND PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

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

Photograph courtesy of the Alaska Department of Fish and Game.

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EXECUTIVE SUMMARY

This Integrated Letter Report and Programmatic Environmental Assessment presents the results of economic and environmental impact evaluations performed to determine if the United States Corps of Engineers (USACE) should participate in a cost-share program for ongoing or future non-federally managed programs to prevent and suppress the spread of northern pike out of the Upper Columbia River Basin (UCRB). The northern pike cost-share program, if funded by Congress through the Aquatic Plant Control Program, would be cost shared at 50 percent with each eligible non-Federal entity (NFE). Eligible activities could include monitoring, suppression, eradication, and public outreach. Federal participation in these activities would aid in the suppression and further spread of northern pike in the combined interest of navigation, flood control, drainage, agriculture, fish and wildlife conservation, public health, and related purposes.

Currently, northern pike is mostly limited to the UCRB; however, the entire Columbia River Basin (CRB) is at high risk of infestation by northern pike, and action is needed because northern pike is an aggressive aquatic invasive species (AIS), which undermines the stability and diversity of native fish communities. Northern pike are voracious predators that substantially reduce prey fish densities. Northern pike are a direct threat to native species protected under the Endangered Species Act (ESA), as they both directly prey on juveniles and outcompete adults for forage. The spread of northern pike within the CRB would be a grave threat to already imperiled anadromous salmon and steelhead.

Existing northern pike suppression efforts are primarily monitoring, suppression (netting), and public outreach activities run collaboratively by the local tribes and State of Washington. Federal participation would provide an opportunity to increase additional monitoring, suppression, and public outreach activities by supplementing regional northern pike AIS programs that have limited resources.

A range of measures to augment and improve the effectiveness and efficiency of northern pike suppression and control were considered, including nineteen measures identified through the scoping process. The nineteen measures were then screened to ensure they met at least one project objective without violating any constraints before being moved forward for alternative development. After formulation of alternatives (combining measures) and screening, Alternative 2, Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression, was identified as the Recommended Alternative. This Recommended Alternative would augment the existing NFE northern pike suppression programs by incorporating a comprehensive range of measures functioning as a suite of tools. These measures would be applied and adjusted annually by each NFE based on its need and ability to fund its portion of the program and the availability of Federal funding.

Total benefits (costs avoided) of Alternative 2 is equal to the sum of benefits from the infestation impacts on hydropower licensing, fisheries, hatcheries, Federal interests, ESA-listed species, recreation, and tourism over the study period of 50 years, with a base year of 2025. At the low-estimate range, total benefits sum to $1.86 billion. At the

high-estimate range, total benefits sum to $2.66 billion. Annualized over the 50 years, average annual benefits range from $72 million to $103 million. Total costs of northern pike suppression include the estimates for eDNA monitoring, suppression efforts, public outreach, reward programs, and eradication via rotenone treatment, ranging from $322,000 to $1.77 million. Annualized over the 50-year period of analysis, the average annual costs range from $334,000 to $1.84 million. Both low- and high-cost estimates have high net benefits and a high benefit-cost ratio (BCR), ranging from $72 million to $101 million net benefits and a BCR between 217 to 1 and 57 to 1.

Additionally, because Federal participation would augment existing non-federally managed northern pike AIS programs that have limited environmental impact, it is anticipated that there would be only minimal direct effects to the environment. The indirect environmental effects of Federal participation in the program would be beneficial. Based on limited scope and effects and the coordination performed for the study, no controversy is anticipated. Additionally, because the program has such a limited initial investment and scope, and can be terminated at any time, there is extremely low residual risk.

INTEGRATED LETTER REPORT AND PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

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

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AIS	aquatic invasive species
APC	Aquatic Plant Control
AWP	annual workplan
BCR	benefit-cost ratio
BA	Biological Assessment
BGEPA	Bald and Golden Eagle Protection Act
°C	Degrees Celsius
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CRB	Columbia River Basin
CTFW	Colville Tribes Fish and Wildlife
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EM	Engineer Manual
EPA	Environmental Protection Agency
EQ	Environmental Quality
ER	Engineer Regulation
ESA	Endangered Species Act
EOs	Executive Orders
°F	Degrees Fahrenheit
FR	Federal Register
FERC	Federal Energy Regulatory Commission
FONSI	Finding of No Significant Impact
FY	fiscal year
IPaC	Information for Planning and Consultation
LR/Programmatic EA	Letter Report and Programmatic Environmental Assessment
MBTA	Migratory Bird Treaty Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
mm TL	Total length in millimeters
NED	National Economic Development
NEPA	National Environmental Policy Act
NFE	non-Federal entity
NHPA	National Historic Preservation Act

NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSE	Other Social Effects
O&M	Operations and Maintenance
PCB	polychlorinated biphenyls
PDTs	project delivery teams
P&N	Purpose and Need Statement
PPA	Project Partnership Agreement
ppm	parts per million
RECONS	Regional Economic System
RED	Regional Economic Development
RHA	River and Harbor Act
SOP	Standard Operating Procedure
SOW	Statements of Work
SRKW	southern resident killer whale
TCP	traditional cultural properties
TMDL	Total Maximum Daily Loads
UCRB	Upper Columbia River Basin
UCUT	Upper Columbia United Tribes
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish & Wildlife
WOTUS	waters of the United States
WRDA	Water Resources Development Act

SECTION 1 - INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This Integrated Letter Report and Programmatic Environmental Assessment (LR/Programmatic EA) presents the results of U.S. Army Corps of Engineers (USACE) evaluations of potential and anticipated consequences of a proposed Federal action to engage in several techniques to help prevent the spread of northern pike (*Esox lucius*) in Eastern Washington and Northern Idaho. The proposed action calls for USACE to cost share with non-Federal entities (NFE) up to 50 percent for costs incurred during the prevention, detection, eradication, and suppression of northern pike, an aquatic invasive species (AIS) present in the Upper Columbia River Basin (UCRB) in Northeastern Washington state and North Idaho state. Potential NFEs include eligible states, tribes, and other non-Federal organizations that implement and manage northern pike suppression programs. This LR/Programmatic EA documents the environmental, planning, and economic considerations used to develop and support the concluding recommendations. It also documents the coordination and evaluations performed for the proposed Federal action to comply with Title 33 Code of Federal Regulations (CFR) Part 230, Procedures for Implementing the National Environmental Policy Act (NEPA) (USACE 1988), and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA, Title 40 CFR Part 1500-1508, effective July 1, 2024.

NEPA is a full disclosure law that provides opportunity for public involvement in the Federal decision-making process. All persons and organizations that have a potential interest in this proposed action—including the public, other Federal agencies, state and local agencies, Native American Tribes, and interested stakeholders—are encouraged to participate in the NEPA process. The programmatic scope of this LR/Programmatic EA allows necessary minor changes in the proposed action to be implemented in response to changing physical and environmental conditions and changes in state and Federal laws over time, including changes to program authorities.

This LR/Programmatic EA includes an evaluation of potential environmental effects of the proposed northern pike suppression efforts. If such effects are less than significant, a Finding of No Significant Impact (FONSI) will be issued, and USACE will proceed with the proposed Federal program. If the environmental effects are determined to be significant, an Environmental Impact Statement (EIS) will be prepared before a decision is reached on whether to implement the program.

1.2 USACE PLANNING PROCESS

This LR/Programmatic EA generally utilizes the USACE planning process contained in the Planning Guidance Notebook Engineer Regulation (ER) 1105-2-100 *Planning Guidance Notebook* (April 2000) and in the Planning Policy for Conducting Civil Works Planning Studies (ER 1105-2-103, December 2023) with the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States

Code [USC] §§ 4321-4335), and implementing regulations (40 CFR Parts 1500-1508 and 33 CFR Part 230). The USACE planning process is not a separate effort from the NEPA process. They have been integrated in the LR/Programmatic EA to complement each other in the project planning process. Table 1-1 presents a crosswalk between the USACE planning process and NEPA. This report documents the results of the planning process, recommends an alternative, and determines whether the project proposed by USACE constitutes a "…major federal action significantly affecting the quality of the human environment…" [NEPA, Section 102(c)], and whether it requires an environmental impact statement (EIS).

Table 1-1. Planning Process and NEPA Crosswalk

Plan Formulation Steps	NEPA Compliance
Scope for project	Scope for NEPA
Specify problems, opportunities, objectives, and constraints	Describe Purpose and Need consistent with projects scope
Inventory forecast and conditions (future without project)	Describe affected environment, existing conditions, trends, No Action Alternative
Formulate alternatives to address objectives	Include and describe reasonable range of alternatives based on Purpose and Need
Compare alternatives and evaluate effects	Evaluate and compare range of alternatives to the No Action Alternative, including direct, indirect, and cumulative effects.
Select a Recommended Alternative	Identify the Agency Preferred Alternative
Release for public review	Public/agency involvement (review and comment)

1.3 AUTHORITY AND GUIDANCE

This report was prepared pursuant to Section 104 of the River and Harbor Act (RHA) of 1958 (33 United States Code [USC] § 610), as amended, which authorizes USACE to administer a comprehensive program to provide for the 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.

It is the policy of USACE that the Aquatic Plant Control (APC) program shall be maintained to control specific types of aquatic invasive infestations of major economic significance (e.g., northern pike within its invasive range). This project would be implemented under the authority of Section 104 of the RHA, as amended. Other supporting USACE policy and guidance includes the following:

- U.S. Department of Army, Office of the Assistant Secretary of Civil Works, Policy Memorandum, U.S. Army Corps of Engineers Invasive Species Policy, dated February 21, 2023.

- ER 1130-2-500, Partners and Support, Chapter 14 – Aquatic Plant Control Program, dated December 27, 1996
- Engineering Pamphlet 1130-2-500, Partners and Support, Chapter 14 – Aquatic Plant Control Program.

1.4 PROJECT AREA AND GEOGRAPHIC SCOPE

Northern pike are currently found in the UCRB in northeastern Washington state and north Idaho state. Northern pike treatments could be cost shared at any location in the states of Idaho and Washington. However, due to its presence at known locations and the need for multi-year treatment regimes, potential treatment locations can be predicted with a high degree of certainty (upstream of Grand Coulee Dam).

For the purpose of this LR/Programmatic EA, the proposed action consists of cost sharing northern pike suppression at any of the known locations of northern pike in the states of Idaho or Washington upstream of Grand Coulee Dam or at any other location within those watersheds (Figure 1-1), excluding those waters managed by USACE or other Federal agencies operating under their own treatment programs. USACE-managed waters would be treated by USACE, according to USACE Aquatic Pest Management Plan (National Marine Fisheries Service [NMFS] Opinion WCRO-2018-00389; U.S. Fish and Wildlife Service [USFWS] Opinion 01EWFW00-2018-F-1271). There are no restrictions on the number of northern pike removed.

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

1.5 PURPOSE AND NEED

The proposed action is to reimburse the Washington State Department of Fish and Wildlife (WDFW) and the Upper Columbia United Tribes (UCUT or Tribes), which consists of the Confederated Tribes of the Colville Reservation, the Spokane Tribes of Indians, the Coeur d'Alene Tribe, the Kalispel Tribe of Indians, and the Kootenai Tribe of Idaho, herein referred to as non-Federal entities or NFE, for costs incurred during the prevention, detection, eradication, and suppression of northern pike, an AIS present in the UCRB in northeastern Washington and north Idaho.

An action is needed because northern pike is an aggressive AIS, which undermines the stability and diversity of native fish communities. Northern pike are voracious predators that substantially reduce prey fish densities. Northern pike are a direct threat to native species protected under the Endangered Species Act (ESA) as they both directly prey on juveniles and outcompete adults for forage. The establishment of northern pike within the CRB would be a grave threat to already imperiled anadromous salmon and steelhead.

Considerable investments by NFEs, such as Tribes and WDFW in the proposed action area, have been directed towards conservation projects for native fish species and habitat restoration in the watersheds upstream of Grand Coulee Dam. These entities, while committed to managing and suppressing northern pike, are limited in their capacity to fully address the issue due to financial constraints. A collaborative effort that combines robust Federal support with local knowledge and action is essential to enhance the effectiveness of northern pike suppression.

The purpose of this proposed action is to supplement and leverage the efforts of NFEs in managing northern pike in the UCRB. By sharing the financial burden, the proposed action aims to expand the scope and scale of ongoing prevention, detection, and suppression efforts. The program would seek to create a synergy between Federal resources and local expertise, fostering a unified response to the challenges posed by northern pike in northeastern Washington and north Idaho. This collaborative endeavor would not only help in restoring ecological balance but would promote the preservation of native fish species that are important to the region's biodiversity and hold unique cultural and economic importance.

1.6 PROBLEMS AND OPPORTUNITIES

The first step in the USACE six-step planning process is the identification of problems and opportunities, which mirrors or overlaps considerably with the Purpose and Need statement in Section 1.5, above. A problem is an existing condition considered for change. An opportunity is a chance to create a more desirable future condition. The identification and development of problems and opportunities specific to Federal participation in northern pike suppression resulted from internal discussions and workshops with the Project Delivery Team (PDT), and external communication with stakeholders and resource agencies that undertake or support northern pike suppression activities.

1.6.1 Problems

The CRB is at high risk of northern pike undermining the stability and diversity of native fish communities. Northern pike are a direct threat to native species protected under the ESA as they both directly prey on juveniles and outcompete adults for forage. The establishment of northern pike within the CRB would be a grave threat to already imperiled anadromous salmon and steelhead. In addition to impacts on ESA-listed species, they also have impacts on:

- Hydropower dam licensing potential
- Tribal and USACE hatchery resources
- Recreation and tourism industries
- Federally managed waterways

1.6.2 Opportunities

Opportunities focus on desirable future conditions and potential ways to address specific problems within the study area. Within the limits of the authorizing legislation, several opportunities were identified to address the significant problems associated with northern pike by decreasing the risk of spread within and out of the project area to non-infested waters. The opportunities, which were identified by collaborating with technical experts from local tribes and USACE, are listed below.

- Improve conditions for ESA-listed and other species
- Improve collaboration with the UCUT
- Help expand tribal fisheries
- Support tribal fisheries department
- Reduce non-target invasive fish
- Reduce non-target invasive plant (flowering rush)—reduce prime breeding and juvenile habitat for northern pike
- Reduce impacts to salmon and cultural heritage in the area
- Educate the public on invasive species
- Enhance recreation—increased for recreational salmon fishing, derbies
- Prevent reduction in waterfowl
- Prevent reduction in aquatic invertebrates

1.7 PROJECT SCOPE: GOALS, OBJECTIVES, AND CONSTRAINTS

1.7.1 Project Goals and Objectives

Project goals and objectives were developed during the scoping phase. Coordination with local tribes and USACE technical staff, along with information from previous studies and reports, were all used to further understand the scope of the study.

The goal of this project is to supplement and leverage the efforts of non-Federal entities in managing northern pike in the UCRB. Objectives, which incorporate the Purpose and Need statement and are planned for 50 years, are show in Table 1-2 and align with the identified goal.

Table 1-2. Project Goal and Objectives

Goals	Objectives
• Supplement and leverage the efforts of non-Federal entities in managing northern pike in the UCRB to help control their spread.	• Reduce the abundance of northern pike to the point at which they are rarely observed. • Maximize the probability of early detection of northern pike in the Study Area. • Prevent the spread of northern pike into anadromous waters outside of the study area. • Prevent impact to USACE-managed waters, fish structure, and managed programs.

1.7.2 Constraints

Project constraints are resource, legal, or policy considerations that limit the range or type of actions that could be implemented to meet planning objectives. The following constraints were identified for this evaluation:

- Utilize proven methods to prevent or reduce northern pike.
- Minimize significant adverse effects to water quality.
- Minimize adverse effects to threatened and endangered species (or to aquatic life).
- Minimize effects to human health and safety.

SECTION 2 - EXISTING CONDITIONS

This section describes the general existing and affected environmental resources conditions that could be influenced by cost sharing northern pike suppression programs. The following resource areas were evaluated in more detail: fish and aquatic resources, water quality, wildlife and terrestrial resources, aesthetics and visual resources, recreation, and historic resources.

2.1 EXISTING CONDITIONS

2.1.1 Northern Pike Biology and Ecology

Figure 2-1. A Northern Pike
Photo courtesy of the National Parks Service.

Northern pike is a predatory freshwater fish species with a broad geographic distribution across the Northern Hemisphere. Native to North America, Europe, and parts of Asia, northern pike inhabit a wide range of freshwater systems, including lakes, rivers, and marshes. Their natural distribution spans much of the northern United States, Canada, and large parts of Europe and Russia, with pike being particularly abundant in cooler, temperate waters (Craig 2008).

Northern pike prefer habitats characterized by slow-moving or still waters with abundant vegetation. They are most often found in the weedy shallows of lakes and in slower-

moving sections of rivers and streams, where aquatic plants provide both cover and ambush sites for hunting. Northern pike can tolerate a wide range of environmental conditions, including variations in water temperature and oxygen levels, though they generally thrive in cooler waters. They are known to inhabit areas with water temperatures ranging from 50° Fahrenheit (F) to 68° F (10° Celsius (C) to 20° C) but can be found in waters as warm as 77° F (25° C) (Casselman and Lewis 1996).

Their ability to adapt to various freshwater environments makes northern pike highly resilient. They are capable of living in brackish waters as well, such as estuaries, which expand their potential habitats into coastal regions. In North America, northern pike are commonly found in the Great Lakes region, throughout Canada's freshwater systems, and in Alaska, while their European range extends from Scandinavia and the British Isles to central and eastern Europe, including Russia (Craig 2008).

Northern pike are easily recognizable by their elongated bodies, large mouths filled with sharp teeth, and distinctive olive-green coloring, often marked by lighter, vertical bar-like spots on their sides. Their body shape is well-suited for quick bursts of speed, allowing them to ambush prey. They have a long, flat snout, which gives them an aerodynamic profile, and their fins are positioned towards the back of their body, enhancing their speed in short, sudden movements (Hubbs and Lagler 2004).

Adults can reach lengths of up to 59 inches (150 centimeters (cm)) and weights of over 55 pounds (25 kilograms (kg)), though typical individuals are much smaller, ranging from 18 to 35 inches (45 to 90 cm) in length and weighing between 3 to 15 pounds (1.5 and 7 kg). Females generally grow larger than males and are longer-lived, which is important for their reproductive success (Pierce 2012).

Northern pike are opportunistic carnivores with a highly predatory nature, feeding on a wide variety of prey, including fish, amphibians, and even small mammals and birds. Their ambush hunting strategy involves remaining motionless in weedy areas before lunging at prey with sudden, powerful movements. Younger pike feed primarily on insects and small fish, but as they grow, their diet shifts to larger prey, including other pike. Northen pike prefer prey with an elongated body shape ("trout-like") and can easily consume trout and salmon up to 16-inches long (Nilsson and Brönmark 2000; Hyvärinen and Vehanen 2004).

Reproduction in northern pike occurs in early spring, typically just after ice-out in colder climates. Northern pike spawn in shallow, vegetated areas, often in flooded marshes or along the edges of lakes and rivers, where water levels are relatively stable. Females can produce between 15,000 and 75,000 eggs, depending on their size, which are scattered over aquatic plants or the substrate. The eggs hatch after 12 to 14 days, depending on water temperature, and the larvae quickly begin feeding on small invertebrates (Harvey 2009).

Juvenile pike grow rapidly, reaching approximately 10 to 15 cm in length by the end of their first summer. This rapid growth helps them avoid predation by larger fish and allows them to become effective predators at an early age. Northern pike reach sexual

maturity between 2 to 4 years of age, with males maturing earlier than females (Pierce 2012).

Northern pike are relatively long-lived fish, with lifespans typically ranging from 10 to 15 years in the wild, though some individuals have been known to live over 20 years. Their longevity, combined with their opportunistic feeding habits and adaptability, allows them to maintain stable populations in suitable environments.

2.1.2 Northern Pike Distribution

Northern pike have spread across various regions in the states of Idaho and Washington. Their introduction in the 1950s through unauthorized stocking in Montana's rivers led to their establishment in the CRB. 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 (CTCR et al. 2018) (Figure 2-2).

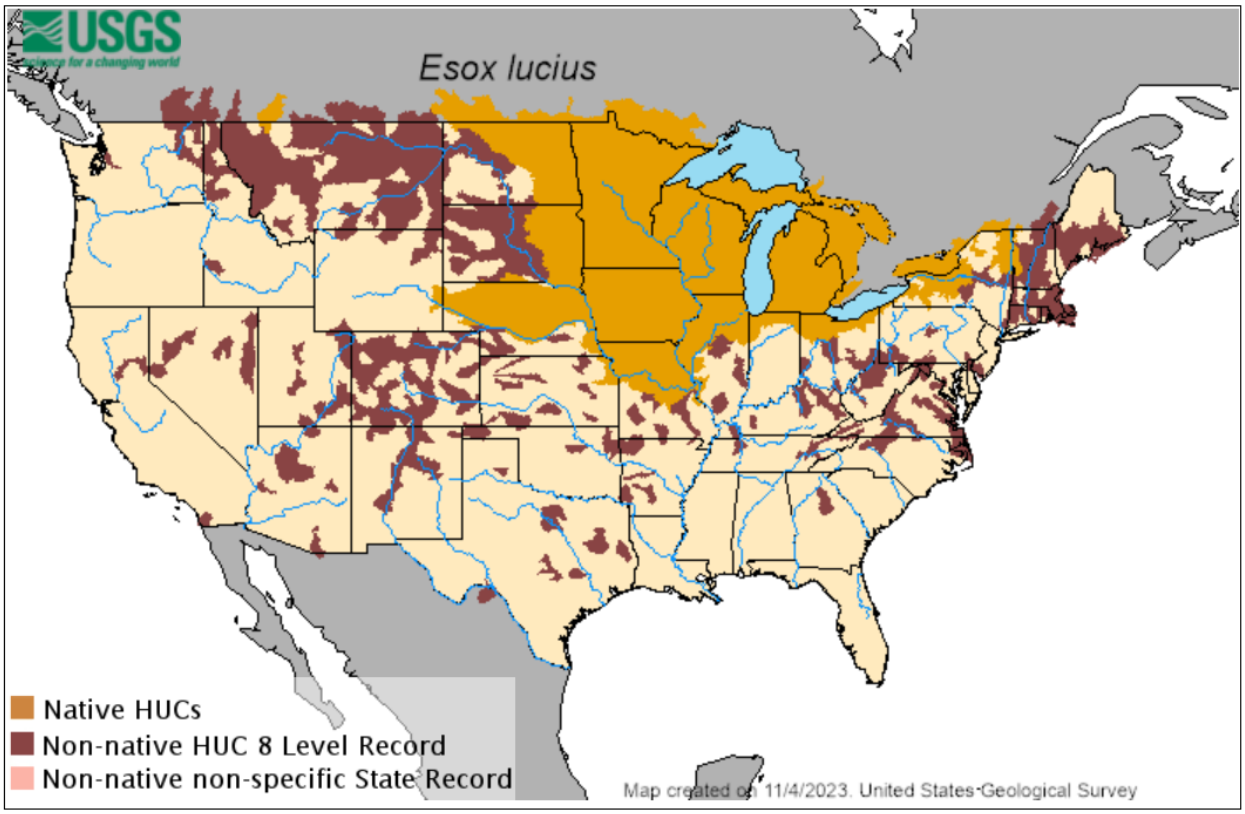

Figure 2-2. Distribution of Northern Pike in the U.S. in Native and Non-Native Level 8 Hydrologic Unit Codes
(Fuller and Neilson 2023)

In Washington, northern pike are found in six Hydrologic Unit Codes (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 For, Lower Kootenai, Pend Oreille River, Pend Oreille Lake, Spokane, St. Joe, and Upper Spokane (Fuller and Neilson 2023).

2.1.3 Current Management Actions

In the proposed action area, current management actions are undertaken by the State of Washington and Confederated Tribes of the Umatilla Indian Reservation. The groups work collaboratively to suppress northern pike spread. The current management actions are described in the following sections.

2.1.3.1 Monitoring Actions

Monitoring efforts include environmental DNA (eDNA) monitoring for presence or absence of northern pike within, upstream, and downstream of the proposed action area. 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 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 is needed to remove the northern pike.

2.1.3.2 Suppression Actions

Suppression actions of northern pike consist of four methods: gillnetting, beach seining, fyke netting, and electrofishing.

Gillnetting

A gillnet (Figure 2-3) is a vertical wall of monofilament or twine netting designed to wedge and capture fish as they attempt to swim through. Wedging occurs when a fish is stuck in the mesh at its point of greatest girth. Gilling (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 (bycatch) (DeAlteris 1998).

Gillnetting can be an effective means of suppressing 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).

Figure 2-3. Gillnetting from a Boat to Catch Northern Pike
Photo courtesy of Confederated Tribes of the Colville Reservation Fish and Wildlife

Beach Seining

Beach seines (Figure 2-4) are low-cost, can capture northern pike, and have minimal harm to bycatch. 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 northern pike (≤ 150 mm total length (mm TL)) in known rearing locations. This method is used during the peak summer months when the reservoir is busy with anglers and recreational boaters.

Figure 2-4. Beach Seine and Captured Northern Pike on Lake Roosevelt
Photo courtesy of Confederated Tribes of the Colville Reservation Fish and Wildlife

Fyke Netting

Fyke nets (Figure 2-5) are used to target young northern pike (≤ 150 mm TL) in known rearing locations. This method is used during the peak summer months when the reservoir is busy with anglers and recreational boaters.

Figure 2-5. Fyke Net Setup to Target Young of the Year Northern Pike
Photo curtesy of Confederated Tribes of the Colville Reservation Fish and Wildlife

Electrofishing

Electrofishing is a widely used method for capturing fish in aquatic environments, particularly for population assessments and removal of invasive species. This technique involves using an electrical current to temporarily immobilize fish, making them easier to capture with nets. Electrofishing systems typically consist of a generator, a control unit, and electrodes, which are deployed from a boat or backpack setup depending on the size and type of water body.

When the electrical current is applied to the water, it creates an electric field that affects fish within a specific radius. The current causes an involuntary muscle response known as galvanotaxis, drawing fish toward the anode where they are briefly stunned. This allows researchers or management crews to safely collect the fish for removal, study, or relocation. Aluminum boats equipped with electrofishing systems (Figure 2-6) are used to collect northern pike. Boat electrofishing is used in known rearing areas when water temperatures are above 61°F (16°C) and juvenile northern pike can be collected in less than 1 meter of water. Boat electrofishing compliments gillnet suppression efforts, allowing for removal of northern pike with minimal impact to non-target fish.

Figure 2-6. Electrofishing for Northern Pike
Photo courtesy of Confederated Tribes of the Colville Reservation Fish and Wildlife

2.1.3.3 Eradication Actions

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.

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 is 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 (CWA), via a National Pollutant Discharge Elimination System (NPDES) pesticide general permit. NPDES permits are administered by the Washington State Department of Ecology (Ecology) in non-tribal waters Washington, by the Idaho Department of Environmental Quality (IDEQ) in non-tribal waters in Idaho, and by the United States Environmental Protection Agency (EPA) on tribal lands in Idaho and Washington.

Rotenone will only be utilized in isolated waters that do not have ESA-listed species, due to impacts on non-target aquatic species

2.1.3.4 Drawdown Surveying

Reservoir drawdowns are conducted independently for operational purposes, primarily to lower reservoir levels in preparation for spring freshets. Peak drawdowns typically occur around May 1. Northern pike, which are particularly sensitive to water level changes due to their specific habitat needs during the spawning period, can become stranded in dewatered areas such as mudflats during these drawdowns. Opportunistic drawdown surveys are conducted during these events, focusing on areas exposed as a result of the lowered water levels. During these surveys, stranded northern pike are observed, collected, and euthanized to support management objectives aimed at controlling their populations and mitigating their impacts on native species (Figure 2-7).

Figure 2-7. Stranded Northern Pike Found during a Drawdown Survey
Photo courtesy of Confederated Tribes of the Colville Reservation Fish and Wildlife

2.1.3.5 Public Outreach

Public outreach is 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 and sharing northern pike information through brochures, emails, articles, podcasts, and booths at events.

2.1.3.6 Reward Program

Programs that encourage incentivized harvest can be an effective management tool if implemented properly. Reward programs typically include public fishing competitions and reward-based initiatives to motivate and involve anglers in northern pike removal efforts, leveraging community participation for enhanced ecological impact.

2.1.4 Existing Conditions and Affected Environment

2.1.4.1 Fish and Aquatic Resources

The proposed action area encompasses a diverse array of aquatic environments, spanning from the expansive reservoirs and rivers in eastern Washington to the pristine lakes and tributaries in northern Idaho. This region's waterways provide critical habitats for a variety of fish species, including both native populations vital to local ecosystems and non-native species introduced for recreational fishing.

The Columbia River system is a defining feature of the aquatic landscape in this area. Flowing through several counties in Washington, including Stevens, Ferry, Okanogan, Douglas, Grant, Lincoln, and Spokane, the Columbia River and its major tributary, the Spokane River, support a complex community of fish. Here, native species such as Chinook salmon (*Oncorhynchus tshawytscha)*, steelhead (*O. mykiss*), bull trout (*Salvelinus confluentus*), and mountain whitefish (*Prosopium williamsoni*) coexist with non-native species like smallmouth bass (*Micropterus dolomieu*), walleye (*Sander vitreus)*, and northern pike. The river's large reservoirs, such as Lake Roosevelt, formed by the Grand Coulee Dam, provide important habitats for both cold-water and warm-water fish. These reservoirs have transformed the natural flow regimes, creating new habitats that favor species like rainbow trout (*O. mykiss*), kokanee salmon (*O. nerka*), and bass, which thrive in the still waters. However, the alteration of natural habitats has also posed challenges to the migration and spawning of native salmon and trout.

Moving northward into Pend Oreille County, the Pend Oreille River and its tributaries represent a mix of ecological conditions, from slow-moving stretches suitable for species like smallmouth bass to faster, colder waters that are ideal for Westslope cutthroat trout (*O. clarkii lewisi)* and bull trout. The presence of northern pike in this area is of particular concern, as their predatory nature threatens native fish populations, necessitating active management efforts to control their spread.

Across the border in Idaho, the aquatic environments transition into a series of deep, clear lakes and swift, cold rivers that define the region's unique aquatic ecology. Lake Pend Oreille, one of the largest and deepest lakes in Idaho, is a critical habitat for kokanee salmon, a key prey species for larger predators like lake trout (*Salvelinus namaycush)* and bull trout. This lake also supports a population of Westslope cutthroat trout, a native species that relies on the cooler temperatures and clean waters of the

lake and its tributaries. The interconnectedness of these water bodies, including the Clark Fork River, highlights the complex web of aquatic life that depends on both lake and riverine systems for different life stages.

Lake Coeur d'Alene in Kootenai County, Idaho is a nearly 50-square-mile natural impoundment of the Coeur d'Alene River. This lake and its tributaries host a variety of fish species, including introduced northern pike and landlocked Chinook salmon, as well as native species like cutthroat trout. The Coeur d'Alene River, feeding into the lake, provides essential spawning grounds for these native trout. However, like many of the region's water bodies, Lake Coeur d'Alene has been influenced by historical mining and logging activities, which have introduced pollutants and sedimentation issues that continue to affect fish habitats today.

Further inland, the St. Joe River and its surrounding lakes in Benewah and Shoshone counties offer some of the region's best cold-water habitats. The St. Joe River, often described as one of Idaho's finest trout streams, supports robust populations of Westslope cutthroat trout, mountain whitefish, and bull trout. These species thrive in the river's clear, cold waters and complex habitat structures, which include riffles, deep pools, and woody debris that provide cover and feeding opportunities.

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 ESA-listed species that could occur within the action area under the jurisdiction of the USFWS or NMFS. Based on a review of all available information, it was determined that two species or designated critical habitats under NMFS' jurisdiction are present in the action area and two species and their designated critical habitats under USFWS' jurisdiction may be present in the action area and could be affected by the proposed action (Table 2-1).

Other ESA-listed species and designated critical habitats identified by the IPaC as potentially present would not be affected by the proposed action because suitable habitat is not present in the action area. Species that would not be affected are described in the Biological Assessment (BA).

Table 2-1. Endangered Species Act Proposed, Threatened, and Endangered Species Potentially Effected by the Proposed Action

Common	Scientific Name	Status	Critical Habitat
Bull Trout	*Salvelinus confluentus*	T	Final
Kootenai River White Sturgeon	*Acipenser transmontanus*	E	Final
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.

2.1.4.2 Water Quality

Water quality conditions across this region vary significantly, driven by both natural factors and human activities. In the lower reaches of the Columbia River and its tributaries, which flow through more developed areas, water quality is often impacted by agricultural runoff, urban development, and industrial discharges. These influences have led to elevated levels of nutrients, such as nitrogen and phosphorus, increased sedimentation, and the presence of contaminants like pesticides and heavy metals. Consequently, several segments of the Columbia River and its tributaries, including parts of the Spokane River, are listed as impaired under the CWA Section 303(d) due to elevated temperatures, low dissolved oxygen levels, and the presence of toxic substances such as PCBs (polychlorinated biphenyls) and heavy metals. These impairments require the development and implementation of Total Maximum Daily Loads (TMDLs) to reduce pollutant levels and improve water quality to meet state and Federal standards.

In contrast, water bodies located in less developed areas, such as the upper reaches of the Pend Oreille River and the St. Joe River, generally exhibit higher water quality. These systems benefit from dense riparian vegetation that act as a natural filter, reducing nutrient runoff and maintaining cooler water temperatures, which are crucial for sustaining cold-water fish species such as bull trout (*Salvelinus confluentus*) and Westslope cutthroat trout (*Oncorhynchus clarkii lewisi*). However, even in these relatively pristine areas, localized water quality issues can occur, often related to historical land use practices such as logging and mining, which have introduced sediments and metals into certain streams.

Lake Pend Oreille and Lake Coeur d'Alene are major water bodies in Northern Idaho that reflect both high natural water quality and the impacts of human activity. While these lakes support diverse aquatic ecosystems, they are subject to seasonal water quality fluctuations due to nutrient loading from surrounding agricultural lands and urban areas, as well as legacy contamination from historical mining activities. Portions of Lake Coeur d'Alene are listed as impaired due to the presence of heavy metals like lead and zinc, which are remnants of past mining activities in the region. These impairments have prompted additional water quality monitoring and management efforts, including restrictions on certain types of development and land use practices to prevent further contamination.

Similarly, Lake Roosevelt, a large reservoir created by the Grand Coulee Dam on the Columbia River, faces water quality challenges primarily related to sedimentation and nutrient loading from upstream sources. The reservoir's fluctuating water levels can exacerbate these issues, leading to periodic algal blooms that decrease water clarity and oxygen levels, affecting fish and other aquatic life. Some segments of Lake Roosevelt are also listed as impaired due to elevated temperatures and contaminants like mercury and PCBs, necessitating TMDL development and other regulatory measures to mitigate these impacts.

Overall, the variability in water quality across the proposed action area reflects a complex interplay between natural landscape features and human-induced influences. Water bodies listed as impaired under the CWA are subject to additional requirements, including the development of TMDLs and enhanced monitoring programs to track progress in reducing pollutant loads. Efforts to manage and improve water quality are ongoing, focusing on reducing pollution sources through best management practices in agriculture and urban settings, enhancing riparian buffers, and implementing targeted restoration projects. These efforts aim to protect and restore the ecological integrity of these critical aquatic resources, ensuring their sustainability for both ecological and human needs.

2.1.4.3 Wildlife and Terrestrial Resources

The proposed action area primarily encompasses water bodies and their surrounding environments across Eastern Washington and Northern Idaho. These aquatic and riparian habitats support a diverse range of vegetation communities and wildlife species, reflecting the unique hydrological and ecological characteristics of the region.

Aquatic and riparian communities are the most significant habitats within the proposed action area. These include the shorelines, wetlands, and floodplains adjacent to major water bodies such as the Columbia River, Pend Oreille River, Spokane River, Lake Coeur d'Alene, and Lake Pend Oreille. Riparian zones are characterized by a mix of vegetation types including cottonwoods (*Populus spp.*), willows (*Salix spp*.), and other moisture-loving plants that stabilize banks and provide essential habitat for many wildlife species. Wetlands associated with these water bodies often support a diversity of sedges, rushes, and other herbaceous plants, which play a crucial role in maintaining water quality and providing habitat for amphibians, birds, and insects.

Several rare and protected plant species can be found in the wetland and riparian areas of the proposed action area. Spalding's catchfly (*Silene spaldingii*), a federally threatened plant, occurs in some moist, open habitats near water bodies, while the Ute ladies'-tresses (*Spiranthes diluvialis*), a rare orchid, is found in wetland habitats that receive consistent moisture. These species are particularly vulnerable to changes in hydrology and habitat disturbances, requiring careful management to ensure their survival.

The wildlife in the proposed action area is closely tied to these aquatic and riparian environments. Fish-eating birds such as bald eagles (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetu*s), and great blue herons (*Ardea herodias*) are common, taking advantage of the abundant fish populations in the rivers and lakes. Wetland and riparian areas provide critical habitats for a variety of waterfowl, including mallards (*Anas platyrhynchos*), wood ducks (*Aix sponsa*), and Canada geese (*Branta canadensis*), which utilize these areas for nesting and foraging.

Mammals such as beavers (*Castor canadensis*) and river otters (*Lontra canadensis*) are frequently observed in these aquatic systems, where they rely on the waterways for food and shelter. Larger mammals, like the black bear (*Ursus americanus*) and mule

deer (*Odocoileus hemionus*), may also use riparian corridors for travel and access to water, especially during drier periods.

The grizzly bear (Ursus arctos horribilis), a threatened species in certain parts of the region, may be indirectly affected by changes to water bodies that alter fish availability and riparian plant communities. The Canada lynx (*Lynx canadensis*) also relies on riparian zones for hunting small mammals during its travels through more forested regions.

While there is no designated ESA critical habitat specifically within the proposed action area, ongoing conservation efforts focus on protecting the water quality and riparian vegetation that support these species. The health of these aquatic systems is vital for maintaining biodiversity and ecosystem function, ensuring the long-term viability of both common and protected species within the region.

2.1.4.4 Aesthetics and Visual Resources

The proposed action area, encompassing a range of water bodies across Eastern Washington and Northern Idaho, is characterized by diverse and visually striking landscapes. The aesthetics of this region are defined by its scenic rivers, expansive lakes, and the natural beauty of the surrounding environments, which include rugged mountains, forested hillsides, and open plains.

The Columbia River and its reservoirs, such as Lake Roosevelt, offer expansive views that combine the serenity of large water bodies with the rugged backdrop of high cliffs and basalt rock formations. These areas are popular for their dramatic vistas, particularly at sunset, when the interplay of light on the water and surrounding terrain creates a visually captivating experience. The sight of open water set against steep canyon walls or rolling hills is a hallmark of the Columbia River basin's aesthetic appeal.

In the more northern parts of the proposed action area, the Pend Oreille River and Lake Pend Oreille are notable for their picturesque qualities, characterized by clear blue waters surrounded by lush, forested mountains. These areas are valued for their tranquil settings, where the combination of water and dense coniferous forests provides a sense of seclusion and natural beauty. The varying water levels and shoreline vegetation throughout the seasons add to the scenic diversity, enhancing the visual experience for visitors and residents alike.

Lake Coeur d'Alene and its tributaries in Idaho offer a unique aesthetic experience, with its crystal-clear waters, pebble beaches, and forested shores. The lake's complex shoreline, punctuated by bays and inlets, provides a dynamic visual landscape that changes with the seasons. In autumn, the mix of evergreen and deciduous trees creates a vibrant tapestry of colors that reflects on the water's surface, enhancing the visual quality of the area. The sight of bald eagles soaring above the lake, particularly during their winter congregation, adds a dynamic wildlife element to the aesthetic experience.

The riparian zones along rivers and streams throughout the proposed action area contribute significantly to the region's visual character. These areas, often lined with cottonwoods and willows, create green ribbons of vegetation that contrast with the drier upland areas. The presence of wetlands, marshes, and floodplains adds to the visual diversity, providing open spaces where water, vegetation, and wildlife converge in ways that are pleasing to the eye.

While much of the aesthetic value of the proposed action area is derived from its natural landscapes, human activities, such as agriculture and recreation, also play a role. Agricultural fields adjacent to water bodies offer a pastoral contrast to the natural surroundings, and recreational infrastructure like marinas and campgrounds is generally designed to blend with the landscape, minimizing visual intrusion.

2.1.4.5 Recreation

The proposed action area, which spans numerous water bodies across Eastern Washington and Northern Idaho, is a popular destination for a wide range of recreational activities. The region's diverse landscapes, characterized by expansive lakes, flowing rivers, and forested shorelines, provide ample opportunities for outdoor enthusiasts to engage in both water-based and land-based recreation.

Water-based recreation is a primary attraction in the proposed action area. Lakes such as Lake Coeur d'Alene, Lake Pend Oreille, and Lake Roosevelt are well-known for boating, fishing, swimming, and water skiing. These lakes offer multiple public access points, marinas, and boat launches that cater to recreational boaters, anglers, and other water users. Anglers are drawn to these waters for their abundant fish populations, including trout, bass, and kokanee salmon, which provide both casual and competitive fishing opportunities. During the summer months, the lakes' beaches and picnic areas are popular spots for families and visitors seeking to enjoy swimming, sunbathing, and picnicking by the water.

The region's rivers, such as the Spokane River, Pend Oreille River, and St. Joe River, also offer a variety of recreational experiences. These rivers are popular for kayaking, canoeing, and whitewater rafting, particularly in sections where the water flow provides the right conditions for these activities. The calm stretches of these rivers are ideal for paddling and wildlife observation, offering a serene environment for those looking to experience nature up close. Fishing is another major draw, with several designated fishing areas along these rivers known for their trout and bass fishing.

Land-based recreation is equally significant in the proposed action area. The scenic beauty of the region's lakes and rivers, coupled with its varied topography, makes it a prime location for hiking, camping, and wildlife viewing. Numerous trails wind through the forests and along the shorelines, providing access to stunning vistas, secluded beaches, and rich wildlife habitats. Hiking and biking trails around Lake Coeur d'Alene and Lake Pend Oreille, as well as in the surrounding national forests, attract visitors throughout the year, offering routes that range from easy walks to challenging backcountry treks.

Wildlife viewing is a particularly popular activity, with opportunities to see a variety of bird species, including bald eagles, osprey, and migratory waterfowl, as well as mammals like deer, moose, and black bears. The region's diverse habitats, from wetlands to upland forests, provide a rich environment for observing wildlife in their natural settings. The annual eagle migration to Lake Coeur d'Alene is a notable event that draws birdwatchers and photographers from around the country.

Winter recreation is also prominent in this area, particularly in the northern sections. Cross-country skiing, snowshoeing, and ice fishing are popular activities on and around frozen lakes and in the snow-covered forests. Local resorts and public lands offer well-maintained trails and facilities that cater to winter sports enthusiasts.

2.1.4.6 Historic Resources

Cultural resources and historic properties in the proposed action area, as defined under Section 106 of the National Historic Preservation Act (NHPA)include precontact and historic archaeological sites, architectural structures such as dams, bridges, and buildings, as well as places of cultural or traditional significance to Native American Tribes, including traditional cultural properties (TCPs) and sacred sites.

The proposed action area, which spans Eastern Washington and Northern Idaho, is rich in cultural heritage, reflecting the long and complex history of Native American habitation, as well as later Euro-American exploration, settlement, and industrial development. Both prehistoric and historic periods are represented in the area's archaeological record, with Native American presence dating back thousands of years, and historic structures associated with the area's development during the 19th and 20th centuries.

Precontact archaeological sites within the region often include evidence of seasonal camps, fishing and hunting areas, and lithic scatters, as well as more permanent village sites. Native American Tribes have longstanding connections to the land and water bodies throughout the region. These tribes historically relied on the area's rivers, lakes, and wetlands for fishing, hunting, and gathering, with salmon being a key resource in their traditional subsistence patterns.

Archaeological evidence suggests that Native American occupation in the region extends back 8,000 to 12,000 years. Sites of significance include fishing weirs and campgrounds along major rivers such as the Columbia and Spokane rivers. Additionally, many locations within the region are considered sacred by Native American communities, including burial grounds and traditional use areas that continue to hold cultural and spiritual importance.

The historical period of the region, spanning the late 1800s through the 20th century, is characterized by Euro-American exploration, settlement, and industrial activities, particularly tied to logging, mining, and dam construction. Historic structures such as the Grand Coulee Dam and the infrastructure associated with railroads and mining camps are important features of this landscape. Many of these sites reflect the region's rapid

industrial development and its role in the transformation of the Northwest into a hub for natural resource extraction and hydroelectric power generation.

Under Section 110 of the National Historic Preservation Act, USACE is required to take responsibility for historic properties by establishing a program to identify, evaluate, and nominate (if appropriate) these sites to the National Register of Historic Places (NRHP). Identification and evaluation of these properties are to be performed by individuals qualified under the Secretary of the Interior's Standards for Archaeology and Historic Preservation (36 CFR Part 61 Appendix A).

SECTION 3 - PLAN FORMULATION AND EVALUATION

3.1 PLANNING FRAMEWORK

Development of this LR/Programmatic EA generally followed the USACE six-step planning process outline in Section 1.2. The six planning steps are (1) specify problems and opportunities; (2) inventory and forecast conditions; (3) formulate alternatives; (4) evaluate effects of alternatives; (5) compare alternatives; and (6) select a recommended alternative. Alternatives were developed in consideration of the study area problems and opportunities as well as the study objectives and constraints, which incorporated the project Purpose and Need Statement (P&N). The four evaluation criteria described in the Principles and Guidelines (completeness, effectiveness, efficiency, and acceptability), were used to develop the alternatives, as well as during the comparison of alternatives, resulting in the selection of the recommended alternative.

- **Acceptability.** Acceptability is the workability and viability of the alternative with respect to acceptance by state and local entities and the public and compatibility with existing laws, regulations, and public policies. Acceptability has two dimensions – implementability and satisfaction. Implementability means the extent to which the alternative is feasible from a technical, financial, and legal perspective. Satisfaction is the extent to which the alternative is welcome from a political or preferential perspective.
- **Completeness.** Completeness is the extent to which the alternatives provide and account for all necessary investments or other actions to ensure the realization of the planning objectives, including actions by other Federal and non-Federal entities. Completeness must consider the sustainability and long-term aspects of the alternatives and whether all resource requirements are included. Completeness does not mean that all planning objectives are fully realized, only that the required resources and actions are included to achieve the estimated benefits.
- **Effectiveness.** Effectiveness is the extent to which the alternatives contribute to achieving the planning objectives. Benefit metrics reflect the effectiveness of each alternative. Effectiveness does not mean that all planning objectives need to be addressed or fully realized. The degree of effectiveness will be used to illustrate the trade-offs between alternatives when compared.
- **Efficiency.** Efficiency is the extent to which an alternative is a cost-effective means of solving the problem and achieving the objectives. Efficiency is determined through a comparison of the costs and benefits of each alternative.

The six-step planning process also identifies and responds to problems and opportunities associated with the Federal objective, as well as specified tribal and state concerns. The process provides a flexible, systematic, and rational framework to make determinations and decisions at each step based on constraints, objectives, and assumptions. This allows the interested public and decision-makers to be fully aware of the basic assumptions employed, the data and information analyzed, the areas of risk and uncertainty, and the significant implications of each alternative that is considered.

Specific project goals and planning study objectives are developed to contribute to Federal Objectives in accordance with national environmental statutes, applicable Executive Orders (EOs), and other Federal planning requirements and policies. Contributions to national improvements are increases in the net value of the national output of goods, services, and ecosystem integrity. Contributions to the Federal objectives include increases in the net value of those goods, services, and ecosystems that are or are not marketable. The use of the term “Federal objectives” is distinguished from planning/study objectives. Study objectives are more specific in terms of expected or desired outputs, whereas Federal objectives are considered a national goal. Federal Objectives were established by WRDA 2007 for water resources investments (ER 1105-2-103). Federal water resources investments must reflect national priorities, encourage economic development, and protect the environment by: (1) Seeking to maximize sustainable economic development; (2) Seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used; and (3) Protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems. The objectives and requirements of applicable laws and Executive Orders are considered throughout the planning process to meet the Federal Objective.

3.2 DEVELOPMENT OF MEASURES

A management measure is a feature or activity that addresses one or more of the planning objectives and is considered a discrete element of an alternative. Alternatives would include measures, either alone or in combination with other measures. This is the same under NEPA. Management measures were identified during scoping which included meetings and conversations with the local tribe’s technical staff, as well as the state of Washington and USACE technical teams that currently utilize various management techniques for northern pike suppression as described in Section 2.1.3, Current Management Actions. Northern pike suppression plans and annual reports from the tribes and the state of Washington were also used to identify management measures. Nineteen measures were identified during scoping:

- Integrated Genetic Suppression Techniques
- Holistic Ecosystem Management Partnership
- Robotic Predators
- Enhanced Bioacoustic Deterrence
- Telemetry
- Aquatic Habitat Optimization
- Community-Based Monitoring Initiative
- Develop Predictive Modeling Tools
- Electrofishing
- Hook and Line

- Baited Traps
- Precision Habitat Surveillance and Management
- Netting: Gillnetting, beach seining, trammel and fyke
- Genetic Analysis
- Incentivized Angler Engagement Program
- Biological and Chemical Intervention
- Surveys During Drawdowns of lake levels
- Environmental DNA (eDNA)
- Public Outreach

3.3 MEASURE SCREENING

The nineteen measures were then screened to determine which met the identified objectives (Table 3-1) without violating any study constraints. A measure must meet at least one objective to be carried forward into alternative development but does not need to meet all objectives. A measure must avoid all constraints to be carried forward.

Table 3-1. Screening Measures by Objectives

Measure	**Objective:** Reduce the abundance of northern pike to the point at which they are rarely observed.	**Objective:** Maximize the probability of early detection of northern pike in the Study Area.	**Objective:** Prevent the spread of northern pike into anadromous waters outside of the study area.	**Objective:** Prevent impact to USACE managed waters, and fish structure and managed programs.
Integrated Genetic Suppression Techniques	X		X	X
Holistic Ecosystem Management Partnership	X		X	X
Robotic Predators	X		X	X
Enhanced Bioacoustic Deterrence	X		X	X
Telemetry	X			
Aquatic Habitat Optimization	X		X	X
Community-Based Monitoring Initiative		X		
Develop Predictive Modeling Tools				
Electrofishing	X	X	X	X
Hook and Line	X		X	X
Baited Traps	X		X	X
Precision Habitat Surveillance and Management				
Netting: Gillnetting, beach seining, trammel and fyke	X	X	X	X
Genetic Analysis				
Incentivized Angler Engagement Program	X		X	X
Biological and Chemical Intervention	X		X	X
Surveys During Drawdowns of lake levels		X		
Environmental DNA (eDNA)		X		
Public Outreach		X		

X – Meets the objective

Measures were screened against constraint to determine whether they could be carried forward to alternative development. The results of this process are summarized below and in Table 3-2.

- Integrated Genetic Suppression Techniques: **Screened Out.** This measure violates the constraint to utilize proven methods. This approach is considered experimental, with limited data to demonstrate its safety and effectiveness at scale.
- Holistic Ecosystem Management Partnership: **Measure retained.**
- Robotic Predators: **Screened Out.** This measure violates the constraint to utilize proven methods. The technology is unproven for broad aquatic management and poses uncertainties about ecological impacts.
- Enhanced Bioacoustic Deterrence: **Screened Out**. This measure violates the constraint to utilize proven methods. Long-term effectiveness and non-target impacts are not yet well-established.
- Telemetry: Measure Retained.
- Aquatic Habitat Optimization: **Screened Out.** This measure violates the constraint to utilize proven methods. Methods proposed under this category were deemed insufficiently tested or potentially disruptive to existing habitat conditions. Due to the adaptability of northern pike and their ability to occupy a wide variety of habitats utilized by native fish, there is limited ability to engineer habitats ill-suited to northern pike without adversely impacting native and ESA-listed fish.
- Community-Based Monitoring Initiative: **Measure Retained.**
- Develop Predictive Modeling Tools: **Screened Out.** This measure violates the constraint to utilize proven methods. While predictive models can be valuable, the specific tools proposed are not yet validated enough to ensure minimal adverse impacts.
- Electrofishing: **Measure Retained.**
- Hook and Line: **Measure Retained.**
- Baited Traps: **Screened Out.** This measure violates the constraint to minimize adverse effects to threatened and endangered species or aquatic life. Traps can inadvertently capture and stress non-target species, including those protected under the ESA.
- Precision Habitat Surveillance and Management: **Screened Out.** This measure violates the constraint to utilize proven methods. High-intensity surveillance or habitat manipulation tactics remain untested on a broad scale, this measure would not lead to more effective prevention, control, or eradication at this time.
- Netting (Gillnetting, Beach Seining, Trammel, Fyke): **Measure Retained.**

- Genetic Analysis: **Screened Out:** Although useful for research, it did not meet the utilize proven methods criterion for direct population suppression and was deemed insufficient as a standalone management measure.
- Incentivized Angler Engagement Program: **Measure Retained.**
- Biological and Chemical Intervention: Measure Partially Retained. There are no known biological agents appropriate to northern pike suppression, so biological intervention element of the measure was screened out. Chemical intervention was retained.
- Surveys During Drawdowns of Lake Levels: **Measure Retained.**

Table 3-2. Measure Screening by Constraints

Measures	**Constraint:** Utilize proven methods to prevent or reduce northern pike.	**Constraint:** Minimize Significant Adverse Effects to Water Quality.	**Constraint:** Minimize Adverse effects to Threatened and Endangered Species or Aquatic Life.	**Constraint:** Minimize effects to Human Health and Safety.	**Measure Carried Forward? Yes (Y) / No (N)**
Integrated Genetic Suppression Techniques					N
Holistic Ecosystem Management Partnership	X				Y
Robotic Predators	X				N
Enhanced Bioacoustic Deterrence					N
Telemetry	X				Y
Aquatic Habitat Optimization					N
Community-Based Monitoring Initiative:	X				Y
Develop Predictive Modeling Tools					N
Electrofishing					Y
Hook and Line	X				Y
Baited Traps	X		Y		N
Precision Habitat Surveillance and Management					N
Netting: Gillnetting, beach seining, trammel and fyke					Y
Genetic Analysis					N
Incentivized Angler Engagement Program					Y
Biological and Chemical Intervention		*	*		Y
Surveys During Drawdowns of lake levels					Y
Environmental DNA (eDNA)					Y
Public Outreach					Y

X - violates the constraint

*Biological and chemical (such as rotenone) only meets objectives and avoids constraints in contained waters that do not have ESA-listed species, due to impacts on non-target aquatic species.

3.4 DESCRIPTION OF MEASURES CARRIED FORWARD

The eleven measures that met at least one objective and did not violate any constraints will be carried forward into alternative development. These measures are organized into six groups by method type and are outlined below:

- **Monitoring Actions:**
  - **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.
  - **Environmental DNA (eDNA):** Employ eDNA sampling techniques to detect the presence of northern pike in water bodies more efficiently. This method can provide early detection of northern pike in new areas, aiding in prompt and targeted control efforts.
- **Suppression Actions:**
  - **Electrofishing:** Electrofishing is a fish capture technique that uses electrical currents to temporarily immobilize fish, making them easy to net. Widely used in fisheries management, it targets specific species or life stages in freshwater systems. For invasive northern pike, electrofishing helps reduce populations while minimizing impacts on non-target species and habitats.
  - **Hook and Line:** Removal by angling and data capture.
  - **Netting:** Gillnetting, beach seining, trammel and fyke.
- **Eradication Actions:**
  - **Chemical Intervention:** This measure employs targeted chemical treatments including Rotenone, to selectively manage northern pike populations in isolated waters.
- **Drawdown Surveying:**
  - **Surveys During Drawdowns of lake levels:** Drawdowns are typically done to lower reservoir levels to accommodate spring freshets. Drawdown surveys, which are done by observation, are conducted opportunistically in areas dewatered as a result of reservoir drawdowns (e.g., mudflats, etc.).
- **Public Outreach:**
  - **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.
- **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.

Measures are further described in Section 2.1.3, Current Management Actions.

3.5 ALTERNATIVES

Alternatives are developed by combining one or more measures that meet the Purpose and Need Statement, meet one or more planning objectives, and avoid all constraints. The evaluation criteria of acceptability, completeness, effectiveness, and efficiency are considered in the development of the alternatives and confirmed for the recommended alternative. Alternatives are compared and evaluated against the No Action Alternative. A No Action Alternative is required by NEPA and represents the northern pike suppression efforts and investments as they currently are, without Federal participation.

3.5.1 Alternative 1, No Change to Current Practices (No Action Alternative)

Alternative 1 represents a continuation of the NFE's current practices (see Section 2.1.3), in which USACE would not cost share with the NFE to suppress and prevent the spread of northern pike in the study area.

3.5.2 Alternative 2, Comprehensive Adaptive Improvements – Cost Shared Northern Pike Suppression

Alternative 2, Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression, is made up of all measures identified in Section 3.4 that met the Federal and study objectives without violating any planning constraints. This alternative assumes USACE would cost share at fifty percent with the NFE using Federal funding

to support and help expand existing northern pike suppression and control programs in the study area. The measures in Alternative 2 are as follows:

- Monitoring Actions:
  - Telemetry
  - Environmental DNA (eDNA)
- Suppression Actions:
  - Electrofishing
  - Hook and Line
  - Netting
- Eradication Actions:
  - Chemical Intervention
- Drawdown Surveying:
  - Surveys During Drawdowns of lake levels
- Public Outreach:
  - Holistic Ecosystem Management Partnership
  - Community-Based Monitoring Initiative
  - Public Education
- Reward Program:
  - Incentivized Angler Engagement Program

Under the future program, each of the measures identified above would be eligible for cost share with the NFE. Not all measures are required to be utilized by the NFE – instead, the best combination of measures would be determined annually by the NFE. Best management measures for each NFE would be determined by their technical staff, based on the needs of their program as well as the ability to fund their portions of the program and the availability of Federal funding. Over time, the locations of activities, and the nature and timing of their operations may change and adapt as the NFEs continue to refine and optimize their program's overall effectiveness.

3.5.3 Alternatives Considered but Not Carried Forward

For this LR/Programmatic EA, Section 104 of the RHA of 1958, as amended, serves as a guide for determining the range of alternatives to be considered. When an action is taken pursuant to a specific statute, the statutory objectives of the project serve as a guide by which to determine the reasonableness of objectives outlined in the NEPA document. This LR/Programmatic EA is being prepared to determine if there is a Federal interest in cost sharing northern pike suppression activities to protect the Columbia River Basin from the spread of aquatic invasive species. This alternatives analysis, therefore, focused on identification of measures/alternatives that can be implemented under such a program.

NEPA does not require an agency to consider all alternatives; rather, only "reasonable alternatives" need to be explored and objectively evaluated. As such, USACE considered a few of other alternatives, but screened them until only the "No Action"

alternative and Alternative 2 (Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression) remained. Other alternatives considered but not moved forward contained discrete subsets of measures such as just monitoring measures, just suppression measures, or just eradication measures. However, these alternatives would not allow for a full suite of tools to be utilized by the NFEs. Alternatives that only provided a subset of tools could limit their ability to adapt as needed to different approaches based on time of year and location and would not satisfy the purpose and need of the action. Therefore, Alternative 2, Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression, was carried forward including the broad list of measures with the flexibility to address the varying and unique regional/local scenarios for northern pike suppression.

It is important to note that the "No Action" alternative is the result of a decade of iterative planning on the part of the NFEs, as they each developed their own programs and grew to work together towards a regional strategy. A number of the measures listed above have been considered and/or implemented to greater or lesser extents, with different timing, locations, and scale, and subject to the constraint of available funding. Absent Federal partnership, the NFEs would continue to refine their northern pike suppression programs, with the scale and components of those programs evolving from year to year.

Similarly, while Alternative 2 provides for comprehensive improvements subject to the constraint of available funding, it is more a framework for an annual adaptive planning process. The measures listed are ones that were developed and analyzed through prior experience by the NFEs. It would be possible to construct alternatives that included the listed measures separately, or in various combinations other than the final combination presented here, but they would not present a complete solution.

3.5.4 Principles and Guidelines Criteria

Consistent with the USACE planning process, alternatives must be formulated in consideration of the four Principles and Guidelines criteria: completeness, effectiveness, efficiency, and acceptability which are described in Section 3.1. How Alternative 2 meets these criteria is outlined below.

- **Completeness.** Alternative 2, Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression, is the most complete solution available to reduce the risk of northern pike spread. Together, the Alternative 2 measures address all planning objectives without violating any planning constraints, creating powerful preventive actions, including monitoring actions, eradication methods, educational opportunities, and reward programs. While this alternative cannot completely eliminate the spread of northern pike, it is the most comprehensive solution identified.
- **Effectiveness.** Alternative 2, Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression, includes a combination of different actions to prevent the spread of northern pike while allowing for local tribes and state AIS coordinators to adjust annually to be implement their programs. This alternative

is not 100 percent effective, but it is a broad solution that will do much to prevent a northern pike spread.

- **Efficiency.** Based on the current level of knowledge, if northern pike continue to expand through the waters of the UCRB, it is likely they will spread quickly. For every year further spread can be deferred through the actions that comprise Alternative 2, Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression, significant costs associated with an infestation can be avoided, particularly for ESA-listed species, tribal and state hatcheries, and for USACE operations. The costs of actions detailed in Alternative 2 would be a small fraction of the Operations and Maintenance (O&M) costs resulting from further spread.
- **Acceptability.** Alternative 2, Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression, is acceptable to all entities that currently work towards northern pike suppression. The efforts of the tribes, the states, and USACE will promote effective communication and coordination of efforts, educate the public, and lead to continuous improvements in the suppression of northern pike. While the solution is not all-encompassing, it is accepted as the most complete and effective solution available.

3.5.5 Risk and Uncertainty

Federal participation in the cost share program would be dependent on the tribes and states continuing to fund their northern pike suppression programs and Congress appropriating funds for the Federal program. Since the Federal cost share program reimburses NFEs for their northern pike suppression costs, the NFEs must have funds allocated to their programs for the continuation of the Federal program. However, there is little risk to the Federal government due to the nature of how the cost share program works. The program works by reimbursing NFE expended funds, if no funds are allocated or spent by the NFE, then no Federal monies can be reimbursed to the NFE. This minimizes the risk to the Federal government significantly.

Since there is not specific congressional appropriation funding for this Federal program, there is uncertainty to out years for participating in this program with the NFE. The Federal program will be contingent on funding available each year within the APC program.

Although individual tribal and state budgets fluctuate annually, the initial estimated annual cost to the Federal government to fully participate in the program would be the same. The commitment of resources may increase if risks increase, or it may decrease, or the program may be eliminated if northern pike become permanently established within the UCRB.

SECTION 4 - ENVIRONMENTAL EFFECTS AND CONSEQUENCES

The NEPA regulations in 40 CFR 1502.16 describe analysis required to determine the environmental consequences. The Environmental Consequences describe the probable effects or impacts of implementing the action alternatives over a 50-year period of analysis. These effects are summarized in Table 4-1.

The probable effects or impacts described in this section may include changes to the affected environment in terms of land use, water quality, air quality, vegetation composition, wildlife populations, habitat quality, cultural resources, and socio-economic conditions. The analysis considers both short-term and long-term effects, considering the dynamic nature of ecosystems and the potential for cumulative impacts over the 50-year period.

The potential effects are typically supported by scientific data, modeling, professional judgement, and other relevant studies conducted during the environmental assessment process. The analysis considers the interactions and trade-offs between different resources and factors to provide a comprehensive understanding of the anticipated effects of each alternative.

The following descriptors are used in the body of this chapter for consistency in describing effect intensity and relative durations in relation to potential significance:

Adverse Effect: Negative, unfavorable, or harmful effects that are detrimental or undesirable.

Beneficial Effect: Positive or advantageous outcome, consequence, or effect resulting from a particular action, intervention, treatment, or circumstance.

No or Negligible Effect: The action would result in no effect, or the effect would not change the resource condition in a perceptible way. Negligible is defined as of such little consequences as to not require additional consideration or mitigation.

Minor Effect: The effect to the resource would be perceptible; however, the effect is unlikely to result in an overall change in resource character.

Moderate Effect: The effect to the resource would be perceptible and may result in an overall change in resource character. Moderate effects are not significant due to their limited context (the geographic, biophysical, and social context in which the effects would occur) or intensity (the severity of the impact, in whatever context it occurs).

Significant Effect: The effect to the resource would be perceptible and would be severe. The effect would likely result in an overall change in resource character. The determination of significant effect to any resource would require the completion of an Environmental Impact Statement.

Direct Effect: Direct effects are caused by the action and occur at the same time and place. Activities that occur from implementation of an alternative would directly create a change, and initial effects would be immediately evident.

Indirect Effect: Indirect effects are caused by the action but are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Activities that occur from implementation of an alternative would not immediately create this change, but would enable change to occur, or change would occur later in time, or farther in distance than the actions.

Short-Term Duration: An effect with a duration measured in hours for aquatic habitat to 3 years in terrestrial habitat.

Long-Term Duration: An effect with duration of more than a month in aquatic habitat and 3 years to 10 years in terrestrial habitat.

Permanent Duration: An effect that would persist for the foreseeable future.

This information serves as a basis for decision-making and allows stakeholders to evaluate the trade-offs and make informed choices regarding the NER Plan/preferred alternative for ecosystem restoration (Table 4-1).

Table 4-1. Summary of Direct and Indirect Effects to Resources

Resource	No Action Alternative	Alternative 2
Aquatic Resources	Minor long-term adverse effects	Moderate long-term beneficial effects
Water Quality	Minor long-term adverse effects	Moderate long-term beneficial effects
Wildlife	Minor long-term adverse effects	Moderate long-term beneficial effects
Aesthetics and Visual Resources	Negligible effects	Moderate long-term beneficial effects
Recreation	Minor long-term adverse effects	Moderate long-term beneficial effects
Cultural and Historic Resources	Minor long-term adverse effects	Moderate long-term beneficial effects
Socioeconomics	Negligible effects	Moderate long-term beneficial effects

4.1 FISH AND AQUATIC RESOURCES

4.1.1 Alternative 1: No Action Alternative (no change to current practice and Future Without Project)

The No Action Alternative would have moderate to major long term adverse effects to fisheries and aquatic resources. Northern pike, as aggressive apex predators, pose a direct threat to native aquatic species and have demonstrated adaptability across a broad spectrum of habitats—ranging from cold to cool/warm water in both riverine and

lake environments. If established throughout the region, northern pike could adversely impact fisheries and aquatic resources within the action area, including species protected under the ESA, by altering the availability and quality of food and shelter as well as through direct predation of juvenile and adult fish. These changes would in turn affect the types and abundance of species able to survive. The No Action Alternative would limit the benefits to fisheries and other aquatic resources.

4.1.2 Alternative 2: Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression

The Proposed Action Alternative would have moderate long-term beneficial effects on aquatic resources. With USACE reimbursing up to 50 percent of the costs, Tribes and state entities would be able to expand their efforts, potentially doubling the monitoring, suppression, and management of northern pike populations. These increased efforts would directly benefit native aquatic species by reducing predation pressure from northern pike, which are known to disrupt food webs and outcompete or prey on native fish. By targeting critical habitats and life stages, management actions could enhance the resilience and stability of native aquatic communities.

Enhanced monitoring, including eDNA testing, would allow for early detection and more targeted suppression of northern pike, reducing their spread and protecting critical habitats. Improved public outreach and education programs would encourage stewardship and promote sustainable practices that support the recovery of native fish species and their habitats. Suppression of northern pike would help maintain biodiversity by supporting species such as salmon, trout, and other native fish integral to the region's aquatic ecosystems.

By reducing the impacts of northern pike on native species and their habitats, the Proposed Action Alternative would foster healthier aquatic ecosystems with improved balance and functionality. Preventing further infestations of northern pike would additionally safeguard essential feeding and breeding habitats, preserving the ecological integrity crucial for native fish survival. This proactive approach would reduce the long-term economic and ecological costs associated with more extensive control measures once pike populations become firmly established.

Therefore, the Proposed Action Alternative would have less than significant effects on aquatic resources.

4.2 WATER QUALITY

4.2.1 No Action Alternative (No Change to Current Practice – Future Without Project Condition)

The No Action Alternative would have minor long-term adverse effects to water quality. Without USACE reimbursement, the Tribes and state agencies would continue to conduct northern pike management actions at their current levels. While these efforts provide some benefits, they are limited by available resources, potentially leading to less frequent or thorough implementation of monitoring, suppression, and public

outreach. In the absence of enhanced management actions, there may be continued pressure on water quality in the action area, particularly in impaired segments of the Columbia River, Lake Roosevelt, and Lake Coeur d'Alene where nutrient loading, sedimentation, and contamination from legacy pollutants already pose challenges. Without increased treatment efforts, northern pike populations may remain higher, which can indirectly affect water quality by altering aquatic ecosystems and leading to further nutrient cycling imbalances.

Therefore, the No Action Alternative would have less than significant effects to water quality.

4.2.2 Alternative 2 - Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression

The Proposed Action Alternative would have moderate long-term beneficial effects to water quality. With USACE reimbursing up to 50 percent of the costs, Tribes and state entities would be able to scale up their efforts, potentially doubling the monitoring, suppression, and management of northern pike populations. This increased effort could lead to more effective reductions in northern pike populations, helping to stabilize aquatic ecosystems and indirectly benefiting water quality. Enhanced monitoring efforts, including eDNA testing, would allow for early detection and faster response, reducing the spread of pike and protecting water bodies from the negative impacts of invasive species. Additionally, greater outreach and public education programs would promote better practices among local populations, contributing to improved water management and pollution reduction efforts.

By increasing the frequency and coverage of these management actions, the proposed action could reduce sedimentation and nutrient loading in affected water bodies, mitigating the effects of contaminants like phosphorus, nitrogen, and heavy metals. The potential reduction of northern pike could lead to more balanced nutrient cycling and improved dissolved oxygen levels in some areas, positively impacting the physicochemical properties of the water.

Therefore, the Proposed Action Alternative would have less than significant effects to water quality.

4.3 WILDLIFE AND TERRESTRIAL RESOURCES

4.3.1 No Action Alternative (No Change to Current Practice – Future Without Project Condition)

The No Action Alternative would have minor long-term adverse effects to wildlife and terrestrial resources. Without USACE reimbursement, the Tribes and state entities would continue their current management of northern pike, but at limited levels due to resource constraints. This limited control of northern pike populations could result in sustained pressure on native fish species, which serve as a primary food source for fish-eating birds like bald eagles, osprey, and herons. The reduced availability of prey species could indirectly affect the health and distribution of these bird populations, as

well as other wildlife species that rely on aquatic ecosystems for food and shelter. Additionally, the limited management efforts could allow for continued degradation of riparian and wetland habitats, as northern pike indirectly contribute to imbalances in aquatic ecosystems that support terrestrial species.

Therefore, the No Action Alternative would have less than significant effects to wildlife and terrestrial resources.

4.3.2 Alternative 2 – Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression

The Proposed Action Alternative would have moderate long-term beneficial effects to wildlife and terrestrial resources. With USACE providing 50 percent reimbursement, the Tribes and state entities would be able to significantly increase northern pike management activities, potentially doubling their efforts. This enhanced control of northern pike populations would help restore balance in the aquatic ecosystems, benefiting native fish species and, by extension, the wildlife that depends on them. Increased availability of prey species would support healthier populations of bald eagles, osprey, herons, and other fish-eating birds.

Moreover, more extensive suppression efforts would contribute to the protection of riparian and wetland habitats. The reduction of northern pike populations could help alleviate pressures on aquatic vegetation and improve water quality, enhancing the conditions for plant species like Spalding's catchfly and Ute ladies'-tresses. The restoration of these habitats would also provide better cover and foraging opportunities for mammals such as beavers, river otters, and larger mammals like black bears and mule deer, which use riparian corridors for travel and access to water.

Therefore, the Proposed Action Alternative would have less than significant effects to wildlife and terrestrial resources.

4.4 AESTHETICS AND VISUAL RESOURCES

4.4.1 No Action Alternative (No Change to Current Practice – Future Without Project Condition)

The No Action Alternative would have negligible long-term adverse effects to aesthetics and visual resources. Without increased northern pike management, the visual landscape would remain largely unchanged. The continued presence of northern pike and their associated impacts on aquatic ecosystems would likely go unnoticed by most visitors, as their presence does not directly affect the scenic qualities of the area’s lakes, rivers, or surrounding landscapes. Riparian and aquatic habitats would continue to evolve under the existing management regime, without any noticeable changes to the visual character of these areas. Any adverse effects to aesthetics would be subtle and long-term, potentially linked to slight degradation of water quality or vegetation health, but unlikely to significantly detract from the overall aesthetic experience.

Therefore, the No Action Alternative would have less than significant effects to aesthetics and visual resources.

4.4.2 Alternative 2 – Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression

The Proposed Action Alternative would have minor long-term beneficial effects to aesthetics and visual resources. By increasing the management of northern pike populations, the program would indirectly support the health and stability of riparian and aquatic ecosystems, which play a key role in maintaining the region's natural beauty. Suppression of northern pike could improve water quality and protect aquatic vegetation, contributing to clearer water and more vibrant shorelines. These improvements would enhance the scenic qualities of water bodies like Lake Coeur d'Alene, Lake Pend Oreille, and the Columbia River, making them more visually appealing for recreation and tourism.

Additionally, the preservation of riparian zones and the promotion of healthy vegetation would support the lush, green ribbons of cottonwoods, willows, and other moisture-loving plants that contrast with the rugged upland areas. The sight of bald eagles, ospreys, and other wildlife that frequent these areas would remain an important visual element, adding to the dynamic beauty of the region. Any changes to the visual environment under this alternative would be beneficial, subtle, and long-term, enhancing the natural aesthetics of the proposed action area.

Therefore, the Proposed Action Alternative would have less than significant effects to aesthetics and visual resources.

4.5 RECREATION

4.5.1 No Action Alternative (No Change to Current Practice – Future Without Project Condition)

The No Action Alternative would have minor long-term adverse effects to recreation. Under this alternative, northern pike populations would continue to be managed at their current levels, with limited suppression measures in place. For some recreational anglers, northern pike provide a unique and challenging sport fishery, especially for those seeking large, aggressive fish. The continued presence of northern pike in the action area may appeal to a small subset of anglers who enjoy the challenge of targeting this non-native species.

However, the sustained presence of northern pike may also negatively impact fishing opportunities for native and preferred game fish species, such as trout, bass, and kokanee salmon. As northern pike populations remain unchecked, their predation on native fish could reduce the abundance of these more desirable species, ultimately diminishing the overall quality of recreational fishing in the region. The trade-off between maintaining northern pike as a sport fishery and preserving more traditional, highly sought-after fisheries may result in fewer opportunities for anglers targeting native species, which could have long-term consequences for recreational enjoyment.

Therefore, the No Action Alternative would have less than significant effects to recreation.

4.5.2 Alternative 2 – Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression

The Proposed Action Alternative would have moderate long-term beneficial effects to recreation. With USACE providing reimbursement for northern pike management, the program would support increased suppression measures that could significantly reduce northern pike populations in the action area. For the broader recreational fishing community, this would result in improved opportunities to fish for native and more desirable species such as trout, bass, and kokanee salmon. Reducing northern pike populations would alleviate their predation pressure on native fish, leading to healthier populations of these species, which are more highly valued by recreational anglers and support both casual and competitive fishing activities.

While some anglers may see the reduction of northern pike as a loss of a unique sport fishery, the overall benefit to the fishing experience in the region would be positive. The enhanced availability of native fish and preferred game species is likely to draw more anglers, contributing to the economic and recreational value of the lakes and rivers. Additionally, as fish populations recover, related recreational activities such as boating, kayaking, and wildlife viewing could also benefit, as the restored ecological balance would lead to healthier and more biodiverse aquatic systems.

In this context, the trade-off between maintaining northern pike as a niche sport fishery and supporting healthier populations of native fish leans in favor of the latter, as the majority of recreational users prefer opportunities to fish for native and game species that are emblematic of the region.

Therefore, the Proposed Action Alternative would have less than significant effects to recreation.

4.6 HISTORICAL RESOURCES

4.6.1 No Action Alternative (No Change to Current Practice – Future Without Project Condition)

The No Action Alternative would have negligible long-term adverse effects to cultural and historic resources. Under this alternative, northern pike populations would continue to be managed at current levels, and there would be no anticipated direct impacts to known archaeological sites, traditional cultural properties (TCPs), or sacred sites. However, the continued presence of northern pike, which threaten native fish species of cultural significance to Native American Tribes, may indirectly affect the preservation of traditional cultural practices related to fishing. Native fish such as salmon have deep cultural and spiritual importance to Tribal Nations in the region, and their decline due to unchecked northern pike populations could impact these cultural connections.

However, since there would be no ground-disturbing activities or significant changes to land use under this alternative, direct impacts to cultural or historic properties are not expected.

Therefore, the No Action Alternative would have less than significant effects to cultural and historic resources.

4.6.2 Alternative 2 – Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression

The Proposed Action Alternative would have minor long-term beneficial effects to cultural and historic resources. By increasing the management and suppression of northern pike populations, the program would help protect native fish species that are of great cultural significance to Native American Tribes in the region. Healthier populations of native fish, such as salmon and trout, would support the continuation of traditional fishing practices and enhance the cultural and spiritual connections between Tribal Nations and their ancestral lands and waters.

While there are no direct impacts to archaeological sites, traditional cultural properties, or historic structures expected, the indirect benefits of preserving native fish populations are likely to have positive cultural effects. Enhanced protection of these native species supports the cultural heritage and practices of Tribes who have historically relied on these fish for subsistence, ceremonies, and cultural identity.

Therefore, the Proposed Action Alternative would have less than significant effects to cultural and historic resources.

4.7 CUMULATIVE EFFECTS

NEPA and the CEQ regulations require Federal agencies to consider the cumulative effects of their actions. Cumulative effects are defined as effects “on the environment which result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR § 1508.7).

The purpose of cumulative effects analysis is to assess the significance of the proposed action in the context of other past, present, and reasonably foreseeable future actions that may affect the same resources.

Past and Present Actions: Past activities in the proposed action area include the introduction of invasive species such as northern pike, which have impacted native fish populations and aquatic ecosystems in northeastern Washington and northern Idaho. Regional efforts to control invasive species and protect native aquatic resources have been ongoing, with Tribal, state, and Federal entities implementing various monitoring, management, and public outreach programs. Since 2017, USACE has implemented similar cost-share programs for invasive species management in the CRB and other

Western U.S. river basins. These programs have supported efforts to control aquatic invasive species (AIS), though northern pike remains a significant concern in the proposed action area.

Reasonably Foreseeable Future Actions: Future actions related to northern pike management are expected to include continued and expanded efforts to suppress northern pike populations through monitoring, suppression, and eradication activities. These efforts are likely to involve collaboration between Federal, state, and Tribal entities, with a focus on protecting native fish species and improving aquatic ecosystem health. As weather patterns continue to influence water temperatures and hydrology in the region, these efforts may become even more critical to maintaining ecological balance in aquatic habitats.

Cumulative Effects Analysis: The proposed Northern Pike Control Cost Share Program, when combined with past, present, and reasonably foreseeable future actions, would not result in significant adverse cumulative effects. The program would increase management efforts for northern pike, which would have beneficial impacts on native fish populations and aquatic ecosystems. These benefits would be realized in combination with other ongoing invasive species management programs, contributing to improved water quality, restored riparian habitats, and enhanced recreational opportunities.

The proposed action would also indirectly support cultural and traditional practices of Native American Tribes by helping to protect native fish species that hold cultural significance. While the program would involve some emissions from vehicles and boats used in management activities, these impacts are expected to be minor and would not contribute significantly to cumulative adverse effects related to air quality.

Overall, the cumulative impact of the proposed action, when considered alongside other efforts to manage northern pike and protect aquatic ecosystems, would be beneficial. No significant adverse cumulative effects are anticipated.

SECTION 5 - ECONOMIC AND ECOSYSTEM CONSIDERATIONS

5.1 ECONOMIC CONSIDERATIONS

The infestation of northern pike in the UCRB poses large negative economic impacts related to salmon and trout population recovery/protection and its associated infrastructure and operations such as fisheries, hydropower dam operations, recreation and tourism, and more. There is regional, statewide, and local effort to reduce the damage and economic impacts that would result from northern pike further spreading; according to the 2018 Montana Invasive Species Summit, “northern pike are only two dams away (89 river miles) from important Columbia River salmon spawning habitat, where Washington has invested billions in salmon and steelhead recovery.” Based on this anticipated risk, this report analyzes benefits via the costs avoided from future infestation and the costs incurred via risk reduction efforts.

Unless stated otherwise, values in the economic analysis are presented at fiscal year (FY) 2025 price levels. Where applicable, escalations are computed utilizing the Yearly Composite Indices of Engineer Manual (EM) 1110-2-1304 *Civil Works Construction Cost Index System,* dated September 30, 2024.

Providing cost and benefit values down to the dollar amount presents a level of precision that does not exist within USACE (or most) models. Therefore, for this LR/Programmatic EA’s analysis, precise calculations are provided within the tables but are rounded when discussed within the report text.

This section evaluates the costs and benefits of the proposed action to address the economic elements of the Federal Objective. As stated in ER 1105-2-103, dated November 7, 2023, “WRDA 2007 established the Federal Objectives for water resources investments… and must encourage economic development… by reasonably maximiz[ing] all benefits, with appropriate consideration of costs” and “Guiding Principles constitute the overarching concepts the Federal Government seeks to promote through Federal investments in water resources now and into the foreseeable future (CEQ 2013)… Federal investments in water resources should encourage sustainable economic development.” For there to be Federal interest, the benefits must exceed the costs.

5.1.1 Infestation Impacts and Benefit Calculation

This section does not attempt to provide the total economic costs of northern pike infestation in the UCRB; such an effort would significantly exceed the scope of this report. Instead, this report focuses on describing the impacts to the water resource-related infrastructure and activities (Federal and non-Federal) within the UCRB that are affected by an infestation, including infrastructure related to USACE-authorized purposes.

The associated impact estimates are based on research found among various Federal agencies and cost impacts available.

5.1.1.1 Hydropower Facilities

Hydropower is a largely available, renewable, clean, and sustainable energy source. The hydroelectric dams within the CRB are responsible for more electricity than any other Northern American river system. According to the Bonneville Power Administration, Federal hydropower is responsible for 44 percent of all hydropower in the United States and serves over 60 million homes and businesses across 33 states.

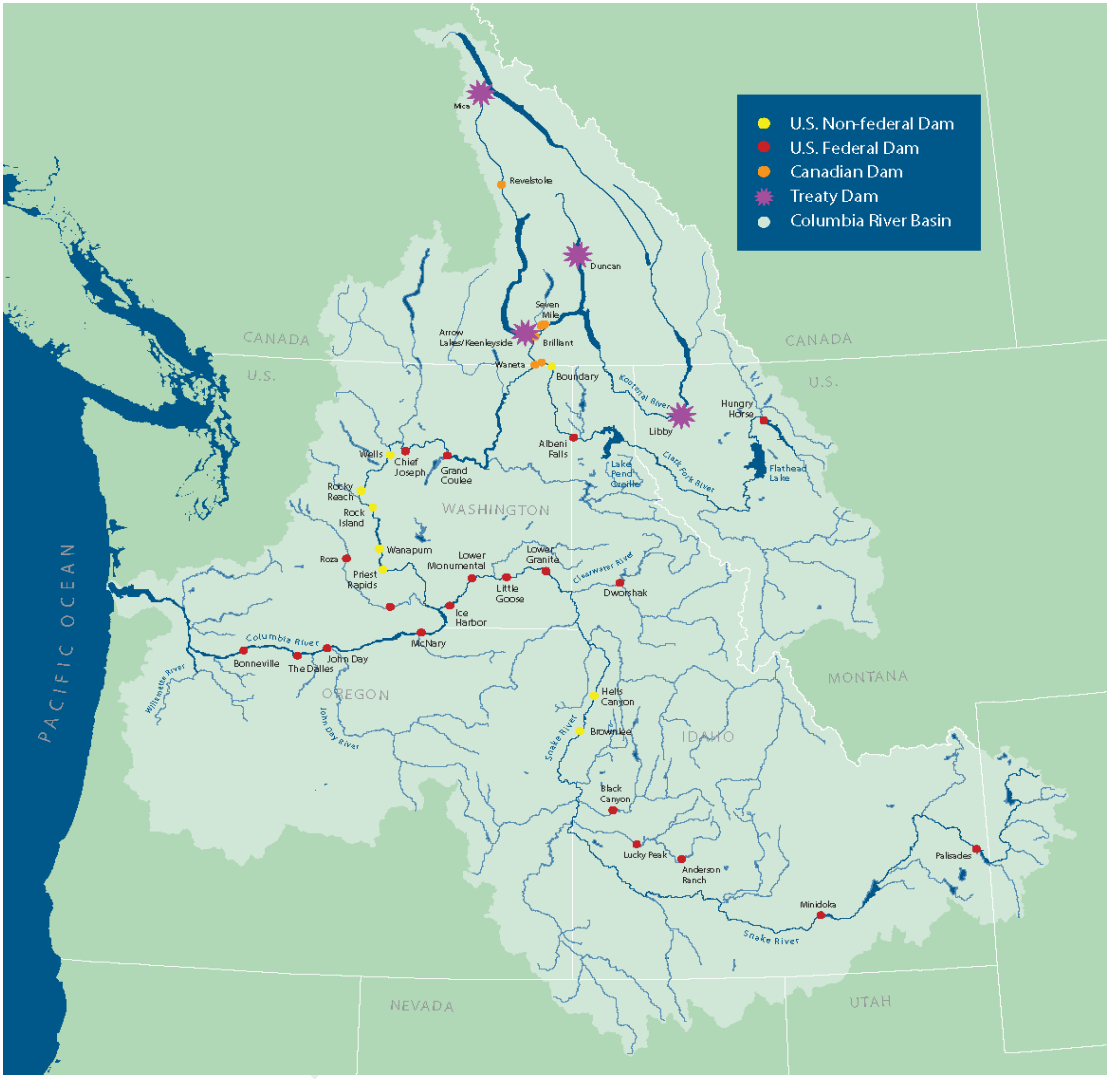

Figure 5-1. The Columbia River Power System
Image courtesy of the Bonneville Power Administration

A northern pike infestation poses potential costs incurred surrounding hydropower operating permit requirements. The Federal Energy Regulatory Commission (FERC) issues 30- to 50-year termed licenses for several dams along the Columbia River, requiring consultation with agencies such as WDFW on mitigation measures for negative hydropower dam impacts. Grand Coulee Dam creates the reservoir Lake Roosevelt and is the last dam upstream on the Columbia River holding back the northern pike infestation alongside Chief Joseph Dam. Suppression efforts have been

underway. However, as stated by fish and wildlife division director Tony Grover, “each of the public utility districts understand that they won’t meet their FERC license requirements if they start losing a lot of fish because [northern pike] come down from Lake Roosevelt.”

The costs associated with FERC license requirements are related to the interagency cooperation of the ESA. Licenses have conditions regarding safe operation, environmental protection, and resource improvement. Fish and wildlife must be protected while also adhering to the preservation of environmental quality. During the re-licensing process, an environmental analysis is performed by FERC. An EA and/or EIS is issued alongside consultation with Federal fish and wildlife agencies to determine any ESA concerns. AIS are required to be monitored and managed to fulfill the FERC license standards, and native salmonids’ populations must meet survival standards.

The Oak Ridge National Laboratory ran a study analyzing hydropower licensing timelines and costs. A total of 107 hydropower projects were randomly selected to be included in the dataset—among those 107, two were projects along the Columbia River. The cost of relicensing development included “planning, consultation, and studies developed and completed for relicensing” and “administrative and general salaries, office supplies, meeting expenses, and costs associated with the conduct of studies.” If unable to meet the ESA requirements for a FERC license due to a northern pike infestation depleting salmonid populations, costs expended range from $13.6 million to $75.3 million (FY25 price level). This price range represents the total cost incurred by the individual Columbia River hydropower facility, where one project incurred a $13.6 million cost and the other $75.3 million, for the described activities.

5.1.1.2 Fisheries, Hatcheries, and Federal Interests

Funding to support northern pike suppression is currently provided through various agencies.

The Colville Tribes Fish and Wildlife (CTFW) has implemented the Northern Pike Reward Program, paying anglers $10 per northern pike head (up to $590 per calendar year). The program is administered solely in Lake Roosevelt, WA. According to a news release by the Tribe, 125 heads were turned in for the 2022 calendar year. The co-managers of Lake Roosevelt (WDFW, CTFW, and the Spokane Tribe of Indians) have stated $9 million annually is invested into the conservation of Lake Roosevelt, and northern pike compromise this mission. From 2015-2023, 19,892 northern pike have been removed from the reservoir. The count for 2024 was at 64 heads as of February. This is a program cost of $199,560.

WDFW’s Interagency Northern Pike Rapid Response Plan, prepared June 2023, details plans for prevention, early detection, routine monitoring, rapid response, and long-term management. The following State of Washington agencies and major tribal fisheries’ coordinating bodies are involved in the plans: the Columbia River Inter-Tribal Fish Commission, Northwest Indian Fisheries Commission, UCUT, Washington Department of Ecology, Washington Department of Natural Resources, Washington Invasive

Species Council, Washington State Department of Agriculture, and WDFW. The northern pike suppression and monitoring costs within these plans include conducting removal through gillnetting and other means, outreach and education to the public, annual progress reports, disseminating data to necessary entities, and more. Actual project cost shares incurred are available for FY19 through FY24. After escalation, total project costs for the Interagency Northern Pike Rapid Response Plan so far are $4.26 million (FY25 price level).

Costs avoided by Federal interests with the proposed action's cost sharing program also include the cost necessary to develop and operate a new, independent USACE northern pike suppression program. Total annual costs of this program would be estimated to be similar to WDFW's Interagency Northern Pike Rapid Response Plan's annual costs: approximately $710,000.

Table 5-1. Costs Avoided by Federal Interests

Year	Original Costs	Escalated Price Level Equivalent FY25
2024	$808,548	$829,582
2023	$790,548	$828,291
2022	$607,649	$652,710
2021	$433,530	$522,943
2020	$648,079	$858,079
2019	$425,455	$568,782
TOTAL	$3,713,809	$4,260,387

5.1.1.3 ESA Species

Southern resident killer whales (SRKW), also known as southern resident orcas, are an ESA-listed species whose diet consists primarily of Chinook salmon. Consequently, as northern pike feed on and deplete the salmon population, a threat is posed to the SRKW's population. On March 14, 2018, State of Washington Governor Jay Inslee signed Executive Order 18-02 Southern Resident Killer Whale Recovery and Task Force. The executive order focuses on immediate steps and long-term solutions for SRKW recovery.

As infestation of northern pike grow and spread, higher costs will be incurred into the recovery of Chinook salmon and consequently, the SRKW population.

To meet Inslee's Executive Order, WDFW alongside private hatcheries, Tribes, and U.S. Fish and Wildlife have increased hatchery production since 2018 with the intent to assist in SRKW recovery. WDFW developed a SRWK Hatchery Improvement Master Plan (2021) that includes improvements to current facilities as well as the addition of two new state hatcheries: the Deschutes River Hatchery and Cowlitz River State Salmon Hatchery. Total increase in Chinook salmon production under the implementation of this Master Plan is proposed to be 51.0 million annually: 36.4 million as new Chinook salmon production potential, 9.1 million as WDFW's production goal,

and 5.35 million as Tribal and Utility Chinook salmon production goal. Total budget requests under this plan are provided from FYs 2021 through 2047, detailed in Table 5-2, below. Total requested budget through FY47 is currently $252 million.

Table 5-2. Biennium Budget Requests for SRKW Hatchery Improvement Master Plan[1]

Starting FY	Ending FY	Total Requested ($1,000s)
2021	2023	$9,143
2023	2025	$8,555
2025	2027	$26,076
2027	2029	$52,478
2029	2031	$26,162
2031	2033	$9,074
2033	2035	$11,638
2035	2037	$11,651
2037	2039	$20,741
2039	2041	$21,818
2041	2043	$9,181
2043	2045	$27,132
2045	2047	$18,114
TOTAL		**$251,763**

[1] FY25 OCT 2024 price level

5.1.1.4 Recreation and Tourism

Recreation and tourism bring visitors to the region and provide economic benefits to the local area. Costs incurred by tourists and recreationalists include fishing equipment and visitation costs such as lodging, gas, and food. The income the tourism industry brings to the local economy also supports the creation of jobs, detailed further in Section 5.1.4.2, Regional Economic Development (RED).

To provide an estimate of the recreation benefits of the potentially impacted area, visitation to Chief Joseph Dam and Rufus Woods Lake are used. Visitation in FY23 to Chief Joseph Dam was 252,455 total persons, which comprised of 32,157 anglers and 22,763 boaters. Within 30 miles of Rufus Woods Lake, this total visitation resulted in $10.6 million (based on FY23 spending; escalated to FY25 price level) in visitor spending, $7.65 million in sales, 64 annual jobs, $2.08 million in labor income, $3.45 million in value added, and $1.85 million in National Economic Development benefits. With multiplier effects, this resulted in $10.9 million in total sales, 83 annual jobs, $2.88 million in labor income, and $4.96 million in value added via wages and salaries of jobs added, payroll benefits, profits, etc. Primary species of fish anglers may catch in Rufus Woods Lake are brown trout, common carp, kokanee, rainbow trout, smallmouth bass, walleye, and yellow perch (WDFW 2024). Northern pike prey on a vast majority of these fish species—particularly the smallmouth bass, walleye, and yellow perch—and have

the potential to negatively impact the visitation spending and income of the local area if they get past Grand Coulee Dam.

Table 5-3. Chief Joseph Dam and Rufus Woods Lake, Value to the Nation

	Original Values FY23	Escalated Value FY25
Visitor Spending	$10,090,399	$10,572,000
Sales	$7,299,335	$7,648,000
Labor Income	$1,985,016	$2,080,000
Value Added	$3,293,045	$3,450,000
NED	$1,769,291	$1,854,000
After Multiplier Effect		
Total Sales	$10,440,683	$10,939,000
Labor Income	$2,752,029	$2,883,000
Value Added	$4,730,813	$4,957,000

Additionally, according to the previously mentioned Executive Order 18-02, “Southern Residents, through the whale watching industry alone, contribute as much as [$82.6 million (escalated to FY25 price level)] to the local economy annually and provide hundreds of jobs to the Puget Sound region.” A depletion of the Chinook salmon population via northern pike predation may negatively impact the visitor spending brought from the SRKW recreation industry as previously detailed in Section 5.1.1.3, ESA Species.

5.1.2 Risk Reduction Costs

The costs associated with the measures carried forward are organized into six groups as described in Section 3.4, Description of Measures Carried Forward: monitoring actions, suppression actions, eradication actions, drawdown surveying, public outreach, and reward programs.

5.1.2.1 Monitoring Actions

Costs associated with eDNA monitoring are the labor time to collect samples, travel to sites, and perform the analysis as well as the cost of supplies.

The approximate fully burdened hourly labor rate for biologists, scientific technicians, and other staff performing the labor is estimated between $35/hour to $75/hour (FY25 price level).

A study was performed in Vernon Parish, Louisiana by the Fort Johnson Military Installation (published 12 March 2024) comparing the cost of eDNA monitoring of the alligator snapping turtle (*Macrochelys temminckii*). As the time and supply costs are estimated to be similar for northern pike eDNA monitoring, results are extrapolated for this analysis. Field work included water collection and water filtration, and lab work included DNA extraction and quantitative polymerase chain reaction. Within the study,

total work hours performed for 76 sites came to be 245.48 hours, which is 3.23 hours worked per site. Supply costs for the study's 76 sites totaled $2,319 in 2020: escalated to be $3,071 (FY25 price level) or $40.40 per site.

Labor travel time from WDFW or UCUT offices to the study site(s) is anticipated to vary roundtrip from 2 to 6 hours.

A low-cost and high-cost estimate is detailed in Table 5-4, below, for the labor and supply costs of eDNA monitoring.

For a low estimate, total cost of eDNA monitoring is approximately $4,700. For a high estimate, total cost of eDNA monitoring is approximately $22,000.

Table 5-4. eDNA Monitoring Cost Estimate[1]

	Low-Cost Estimate	High-Cost Estimate
Labor Costs		
Fully Burdened Hourly Rate	$35	$75
Number of Sites	30	75
Time per Site (Hours)[2]	3.23	3.23
Hours Worked		
Field and Lab	96.90	242.25
Travel Time to Site	2.0	6.0
Labor Cost Subtotal	**$3,462**	**$18,619**
Supply Costs		
Cost per Site[2]	$40.40	$40.40
Supply Cost Subtotal	**$1,212**	**$3,030**
TOTAL COST	**$4,674**	**$21,649**

[1] FY25 OCT 2024 price level

[2] per site estimates extrapolated from Fort Johnson Military Installation 2024 Study

5.1.2.2 Suppression Actions

Costs associated with suppression actions are the costs of gillnetting, beach seining, fyke netting, and electrofishing.

Under the Columbia Basin Fish & Wildlife Program's Northern Pike Suppression and Monitoring plan, costs budgeted for suppression efforts by the CTFW and Spokane Tribes from 2019 through 2025 are available. Suppression efforts under this plan include the same actions such as gillnetting, beach seining, electrofishing, and other methods in Lake Roosevelt. Annual costs of the Lake Roosevelt suppression efforts are listed in Table 5-5, below.

Table 5-5. Columbia Basin Fish & Wildlife Program Northern Pike Suppression and Monitoring Budget[1]

Start	End	Budget
1-Aug-2019	30-Sep-2020	$409,820
1-Aug-2020	31-Jul-2021	$257,650
1-Aug-2021	31-Jul-2022	$242,312
1-Aug-2022	31-Jul-2023	$335,900
1-Aug-2023	31-Jul-2024	$429,977
1-Aug-2024	31-Jul-2025	$422,725

[1] FY25 OCT 2024 price level

5.1.2.3 Eradication Actions

If determined to be required, costs associated with eradication actions are the cost of rotenone, labor, and travel time (and consequently, costs associated with travel).

Cost analysis was coordinated and obtained from WDFW to estimate potential costs when applied to northern pike. Costs are based on the estimate of 2 parts per million (ppm) of rotenone necessary for northern pike eradication.

Material costs are detailed in Table 5-6, below. Costs have increased dramatically from 2018 through 2023. Assumptions below are based on material costs observed in 2023. However, costs are anticipated to continue to increase. Rotenone powder active ingredient is assumed to be 5.5 percent for this analysis. Low- to high-cost estimates are given based on varying waterbody volumes, ranging from a total material cost of $27,000 to $1.11 million.

Table 5-6. Rotenone Material(s) Cost Estimate for 2 ppm Treatment[1]

Area (ac)	Mean Depth (ft)	Volume (ac ft)	Total Powder (lbs)	Powder Cost ($/lb)	Powder Sub-Total	Liquid (gal)	Liquid Cost ($/gal)	Liquid Sub-Total	Total Material Cost
25	20	500	2,323	$8.48	$19,698	20	$361.27	$7,225	**$26,923**
100	25	2,500	12,101	$8.48	$102,620	35	$361.27	$12,644	**$115,264**
200	25	5,000	24,353	$8.48	$206,510	50	$361.27	$18,064	**$224,574**
1,000	25	25,000	122,138	$8.48	$1,035,728	200	$361.27	$72,254	**$1,107,982**

[1] FY25 OCT 2024 price level

ac = acre; ft = ft; lbs = pounds; gal = gallon

Labor and travel costs associated with rotenone treatment are based on the assumptions below with treatment being conducted by WDFW.

- Necessary staff: project lead, assistant, and general staff.
    - Number of general staff ranges from 5 to 22 depending on size of waterbody (500 to 25,000 acre-feet)

- Treatment tasks: signage, water chemistry sampling, general preparation, application, post-treatment cleanup, and travel to and from project sites.
- Per diem and lodging: based on FY25 October 2024 Washington state rates.
- Vehicle O&M: assumes 200 miles roundtrip per trip (duty station to project site).

Labor and associated travel costs are summarized in Table 5-7, below, and range from $21,000 to $103,000.

Table 5-7. Rotenone Labor and Travel Cost Estimate[1]

Total ppm	Area (ac)	Mean Depth (ft)	Volume (ac ft)	Labor Cost	Per Diem & Lodging	Vehicle O&M	Total Labor & Travel Cost
2	25	20	500	$15,898	$2,674	$1,932	**$20,504**
2	100	25	2,500	$24,556	$4,966	$3,257	**$32,779**
2	200	25	5,000	$34,657	$7,640	$4,985	**$47,282**
2	1,000	25	25,000	$74,902	$20,904	$7,051	**$102,857**

[1] FY25 OCT 2024 price level

Total cost of rotenone treatment is summarized in Table 5-8, below, which sums the material, labor, and travel costs. Depending on the size of the waterbody (500 to 25,000 acre-feet) and assuming 2 ppm necessary, total cost ranges from $47,000 to $1.21 million.

Table 5-8. Total Rotenone Cost Estimate[1]

Total ppm	Area (ac)	Mean Depth (ft)	Volume (ac ft)	Material Cost	Labor & Travel Cost	Total Cost Estimate
2	25	20	500	$26,923	$20,504	**$47,427**
2	100	25	2,500	$115,264	$32,779	**$148,043**
2	200	25	5,000	$224,574	$47,282	**$271,856**
2	1,000	25	25,000	$1,107,982	$102,857	**$1,210,839**

[1] FY25 OCT 2024 price level

5.1.2.4 Drawdown Surveying

Outright costs are not estimated to be associated with drawdown surveying as the measure is conducted independently for operational purposes and would not be incurred as a result of this LR/Programmatic EA's proposed action.

5.1.2.5 Public Outreach

Costs associated with public outreach primarily include the labor time required to produce informational signs, brochures, emails, etc. and distribute to the public.

Depending on the level of effort, a range of estimated costs is provided in Table 5-9, below, utilizing the approximate fully burdened hourly labor rate of employees assigned to the public outreach work.

Table 5-9. Public Outreach Cost Estimate[1]

	Low-Cost Estimate	High-Cost Estimate
Fully Burdened Hourly Rate	$35	$75
Hours Worked	160	320
TOTAL COST	**$5,600**	**$24,000**

[1] FY25 OCT 2024 price level

For a low estimate at 4 weeks of man hours, total cost of public outreach is approximately $5,600. For a high estimate at 8 weeks of man hours, total cost of public outreach is approximately $24,000.

5.1.2.6 Reward Programs

Costs associated with further reward programs is anticipated to be similar to the CTFW Northern Pike Reward Program currently in place, rewarding anglers for each northern pike head turned in, or similar public removal efforts. The CTFW Northern Pike Reward Program had 19,892 northern pike removed by anglers between 2015 and 2023, which is an average of 2,487 northern pike removed per year. At $10 per northern pike, that is an approximate cost of $24,870 rewarded per year.

Labor costs of running the program would vary depending on the type of reward program selected, such as a public fishing competition versus rewarding per head turned in, etc.

A low-cost and high-cost estimate utilizing the above assumptions for baseline conditions is detailed in Table 5-10, below.

Table 5-10. Reward Program Cost Estimate[1]

	Low-Cost Estimate	High-Cost Estimate
Fully-Burdened Hourly Rate	$35	$75
Hours Worked	160	320
Labor Costs Subtotal	**$5,600**	**$24,000**
Reward per Northern Pike	$8	$15
Northern Pike Removed	2000	4000
Reward Costs Subtotal	**$16,000**	**$60,000**
TOTAL COST	**$21,600**	**$84,000**

[1] FY25 OCT 2024 price level

For a low estimate at four weeks of man hours and 2,000 northern pike removed at $8 per fish, total cost of a reward program is approximately $22,000. For a high estimate at eight weeks of man hours and 4,000 northern pike removed at $15 per fish, total cost of a reward program is approximately $84,000.

5.1.3 Benefit-Cost Ratio (BCR) and Analysis

Per the USACE Planning Manual Institute for Water Resources Report 96-R-21, dated November 1996, the BCR is defined as average annual equivalent benefits (AAB) divided by average annual equivalent costs (AAC). Net benefits is defined as AAB minus AAC. Economic feasibility requires that the BCR be equal to or greater than one, and the net benefits be non-negative.

Annualized computations use the FY25 Federal discount rate of 3.0 percent over a 50-year period of analysis with base year 2025.

Detailed in Table 5-11, below, total annual benefits (costs avoided) of Alternative 2 is equal to the sum of benefits from the infestation impacts on hydropower licensing, fisheries, hatcheries, Federal interests, ESA species, recreation, and tourism. The hydropower licensing costs are assumed to be one-time costs every 30 years.

Table 5-11. Summary of Total Annual Benefits (Costs Avoided)[1]

Infrastructure	Low-Cost Estimate	High-Cost Estimate
Hydropower Licensing	$13,636,159	$75,266,251
CTFW Reward Program	$22,102	$22,102
Interagency Suppression Plan	$710,065	$710,065
Independent USACE Program	$710,065	$710,065
ESA Species	$8,555,000	$52,478,000
Recreation and Tourism	$101,410,716	$101,410,716
TOTAL BENEFITS	**$125,044,107**	**$230,597,199**

[1] FY25 OCT 2024 price level

Total costs of northern pike suppression include the estimates for eDNA monitoring, suppression efforts, public outreach, reward programs, and eradication via rotenone treatment. A summary of total costs is detailed in Table 5-12, below, ranging from $322,000 to $1.77 million.

Table 5-12. Summary of Total Costs[1]

	Low-Cost Estimate	High-Cost Estimate
eDNA Monitoring	$4,674	$21,649
Suppression Actions	$242,312	$429,977
Eradication Actions	$47,427	$1,210,839
Public Outreach	$5,600	$24,000
Reward Programs	$21,600	$84,000
TOTAL COST	**$321,612**	**$1,770,465**

[1] FY25 OCT 2024 price level

Detailed in the economic summary within Table 5-13, below, at the low-estimate range, total present worth benefits over the 50-year period of analysis sum to $1.86 billion. At the high-estimate range, total present worth benefits sum to $2.66 billion. Annualized over the 50-year period of analysis, average annual benefits range from $72.3 million to $103 million, and the average annual costs range from $334,000 to $1.84 million.

Both low- and high-cost estimates have high net benefits and a high BCR, ranging from $72.0 million to $102 million net benefits and a BCR between 217 to 1 and 57 to 1.

Table 5-13. Economic Summary of Alternative 2 Benefits and Costs

	Low-Cost Estimate	High-Cost Estimate
Total Present Worth Benefits	$1,861,530,626	$2,661,248,186
Average Annual Benefits	$72,349,308	$103,430,727
Average Annual Cost	$334,112	$1,839,275
Net Benefits	$72,015,197	$101,591,452
Benefit-Cost Ratio	217:1	57:1

[1] FY25 OCT 2024 price level

5.1.4 Comprehensive Benefits

As outlined in policy memorandum Comprehensive Documentation of Benefits in Decision Document, dated January 5, 2021, project delivery teams (PDTs) must identify and analyze benefits in total and equally across a full array of benefit categories. This directive applies to all USACE elements having Civil Works planning, engineering, design, construction, and operations and maintenance responsibilities. Benefit categories encompass economic (national and regional), environmental (national and regional), and social considerations.

5.1.4.1 National Economic Development (NED)

The NED account displays changes in the economic value of the national output of goods and services. According to ER 1105-2-100 Planning Guidance Notebook, contributions to NED are the direct net benefits that accrue in the planning area and the rest of the nation. Net benefits range from $72.0 million to $102 million.

5.1.4.2 Regional Economic Development (RED)

The RED account measures changes in the distribution of regional economic activity that would result from an alternative. Evaluations of regional effects are measured using nationally consistent projections of income, employment, output, and population. The Regional Economic System (RECONS) is a tool designed to provide estimates of regional, state, and national contributions of Federal spending associated with Civil Works and American Recovery and Reinvestment Act projects. The model implements regional economic development multipliers to estimate the additional economic output, jobs, earnings, and value added to the region from alternatives based on project implementation costs. As a result, larger, more expensive alternatives result in higher regional economic benefits. The generated benefits to the regional economy are mainly through construction activities.

For the purpose of this analysis, the generated benefits are through the estimated costs expended from the average annual costs of the Recommended Alternative, Alternative 2 and assumes the approximate location of Grand Coulee Dam located in Grant County, WA. These activities can impact the levels of income, economic output, and employment throughout the region.

The expenditures associated with all work activities at Grant County, WA, for alternative 2 are estimated range from $327,000 to $1.81 million. Of this total expenditure, $199,000 to $1.10 million will be captured within the local impact area. The remainder of the expenditures will be captured within the state impact area and the nation. These direct expenditures generate additional economic activity, often called secondary or multiplier effects. The direct and secondary impacts are measured in output, jobs, labor income, and gross regional product (value added) as summarized in the following tables. The regional economic effects are shown for the local, state, and national impact areas. In summary, the expenditures $327,000 to $1.81 million support a total of 2 to 13 full-time annual equivalent jobs, $154,000 to $854,000 in labor income, $195,000 to $1.08 million in the gross regional product, and $283,000 to $1.56 million in economic output in the local impact area. More broadly, these expenditures support 6 to 33 full-time annual equivalent jobs, $445,000 to $2.46 million in labor income, $563,000 to $3.11 million in the gross regional product, and $904,000 to $5.00 million in economic output in the nation.

All benefits captured here are provided in annual units in FY25 price levels.

5.1.4.3 Other Social Effects (OSE)

The OSE benefit category relates to the quality of human life, health, and safety in the community. Destruction or disruption of the built environment, aesthetic values, community cohesion, economic viability, and availability of public facilities and services may be analyzed under this benefit category. Assessments of beneficial and adverse effects are based on comparisons to the No Action Alternative. The purpose of the OSE analysis is to show the beneficial and adverse effects of a project on the social wellbeing of the study area. The OSE account typically includes long-term community impacts in the areas of public facilities and services, recreational opportunities, transportation and traffic, and manmade and natural resources. The OSE account also integrates information into the planning process that is not reflected in the other three accounts used by USACE to evaluate projects and alternatives. OSE effects include impacts to humans under the following categories: health and safety, social vulnerability and resilience, economic vitality, social connectedness, identity, participation, and leisure and activity.

Northern pike are not anticipated to negatively impact life safety and have negligible impacts to human health. Should anglers choose to consume this fish in moderation, there are positive health benefits to the human diet as it is a good source of protein, vitamins, and other nutrients. However, high consumption or consumption of northern pike larger than 24 inches may pose the danger of mercury poisoning.

Under the reward program measure, the potential for fishing competitions may bring social connectedness among communities as friends and family come together to participate. Increased time spent outdoors angling can also bring positive impacts to mental wellbeing.

Under the No Action Alternative project condition, it is anticipated Washington communities would experience the negative effects of depleted salmonid populations, particularly impacting anglers and recreationalists.

5.1.4.4 Environmental Quality (EQ)

The EQ account is intended to indicate the long-term effects that the alternative may have on significant environmental resources. Significant environmental resources are defined by the Water Resources Council as those components of the ecological, cultural, and aesthetic environments which, if affected by the alternative, could have a material bearing on the decision-making process. Significance is derived from institutional, public, or technical recognition that a resource or an effect is significant.

Northern pike compete with both fish and aquatic plants for food and habitat, which often results in decreased native fish populations. With implementation of the proposed alternative, there would be less competition for environmental resources between the northern pike and the native fish populations.

5.2 ECOSYSTEM CONSIDERATIONS

If northern pike were to remain widespread or increase their presence in Eastern Washington and Northern Idaho or establish at new locations within the Columbia River Basin, significant changes to the aquatic environment could occur. As apex predators, northern pike have the potential to dramatically alter food webs by preying on native fish species, including trout, salmon, and other ecologically or culturally significant species. This predation could lead to reduced populations of smaller fish, disrupting the balance of aquatic ecosystems and diminishing biodiversity.

The increased presence of northern pike could affect aquatic vegetation indirectly. By reducing populations of herbivorous or smaller fish species, pike could contribute to shifts in vegetation dynamics, potentially allowing invasive aquatic plants to thrive unchecked. Additionally, pike may alter nutrient cycling by consuming fish species that play key roles in ecosystem processes, further influencing the structure and function of aquatic habitats.

The persistence of northern pike could also undermine decades of investments in habitat restoration and native species recovery efforts within the basin. Physical injury to migratory fish due to predation, especially juvenile salmonids, could hinder recovery goals. Recreational fisheries targeting native or preferred game species could decline as northern pike outcompete or prey upon these fish.

While it may not be possible to eliminate northern pike entirely, increased management efforts would provide time to mitigate their impacts. Expanding public education programs to highlight the consequences of invasive species and increasing monitoring for early detection of new populations could improve suppression strategies. Controlling northern pike populations is crucial to preserving native fish species and maintaining the ecological integrity of the Columbia River Basin.

SECTION 6 - RECOMMENDED ALTERNATIVE AND IMPLEMENTATION

Based on the information evaluated in this LR/Programmatic EA, USACE selects Alternative 2, Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression, as the Recommended Alternative. The Recommended Alternative is made up of all measures identified in Section 3.4 that meet the study objectives without violating any planning constraints. This alternative assumes USACE would cost share at fifty percent with the NFE using Federal funding to support and help expand existing northern pike suppression and control programs in the study area (Section 2.2.3). The measures in Alternative 2 are as follows:

- Holistic Ecosystem Management Partnership
- Telemetry
- Community-Based Monitoring Initiative:
- Electrofishing
- Hook and Line
- Netting: Gillnetting, beach seining, trammel and fyke
- Incentivized Angler Engagement Program
- Chemical Intervention
- Surveys During Drawdowns of lake levels
- Environmental DNA (eDNA)
- Public Outreach

The Recommended Alternative assumes the Federal investment would augment non-Federal funds, resulting in increased effectiveness of northern pike suppression programs to decrease the risk of their spread. With a BCR ranging from 91:1 to 354:1 and net benefits ranging from $115 million to $163 million, USACE has determined that there is Federal interest in partnering with non-Federal entities to address the vulnerability of the UCRB to northern pike.

6.1 IMPLEMENATION ELEMENTS

This section generally describes how the cost-share program would function.

6.1.1 Project Partnership Agreements

Upon review and approval of the LR/Programmatic EA, USACE is authorized to execute the northern pike suppression cost-share program through Project Partnership Agreements (PPA) with non-Federal entities. Non-Federal entities can be tribes, states or other entities that implement northern pike suppression programs in the study area. PPAs are template documents developed by USACE HQ for the AIS program. A deviation from the template language may be requested, however any major deviations

would require approval from the MSC (NWD) and HQ. What is considered a major deviation is at the discretion of USACE. PPAs are required to be executed annually and must be signed by the non-Federal entity and the NWW commander.

6.1.2 Annual Work Plans

After receipt of Federal funds for the northern pike suppression cost-share program, USACE would send an email to each participating NFE, or their selected representative, asking for annual workplans (AWPs) for the upcoming season. USACE contract seasons typically run from July 1 to June 30 each year. AWPs must include their planned eligible northern pike suppression and monitoring activities, and estimated budgets for the upcoming season. The estimated budget must be limited to the available funds from both the NFE and Federal partners. USACE staff will review each work plan for eligibility and environmental compliance requirements.

6.1.3 Statements of Work

USACE would then incorporate the approved AWP into a statement of work. Statements of Work (SOW) outline annual requirements and document the eligible activities and budget for the upcoming period of performance/season. After the SOW is finalized and approved by USACE technical, financial, and legal staff, the SOW must be signed by the NFE and the NWW Commander. Signing the SOW will obligate the funds to make them available for reimbursement for the period of performance covered by the SOW.

6.1.4 Method of Payment

To receive reimbursement for eligible activities, each NFE shall submit properly executed and duly certified invoices covering eligible northern pike suppression activities. Appropriate documentation includes invoices and certification of specific payments to contractors, suppliers, and employees that are performing eligible activities. USACE shall review such documentation to determine and certify the activities costs as either allowable costs, not allowable costs, or costs that require additional supporting information. The submission must include sufficient information to support a determination by USACE that the costs are necessary for the suppression and monitoring of northern pike. Such written certification by USACE is required to support any payments under this authority. Written certification comes from the program managers as “ok to pay” on each invoice. Following such certification, and subject to the availability of funding, USACE shall make payment in accordance with the authority and PPA.

Federal participation in the program would be dependent on non-Federal entities continuing to fund the program, Congress appropriating funds for the Aquatic Plant Control program, and additional funds being available from the APC program to fund “other” AIS prevention and control activities through a cost share program.

6.1.5 Annual Reporting

Annually, USACE staff will request final reports along with final invoices for end of season closeouts. Annual reports are required to include a summary of season activities and expenditures, and a summary table in the provided template format. This reporting is collected and reviewed to ensure USACE is meeting its program requirements. The reports also enable USACE technical staff to answer any program data requests from USACE or other governmental oversight agencies.

6.2 ROLES AND RESPONSIBILITIES

6.2.1 USACE/Federal Government

USACE, with the non-Federal entities' assistance, shall complete all environmental compliance requirements, obtain all applicable licenses and necessary permits, and comply with applicable Federal labor laws covering non-Federal construction.

6.2.2 Non-Federal Entities

The non-Federal Entity is responsible for ensuring that any real property or less-than-fee property interests acquired for the placement of a drop off stations or related activity meet USACE Real Estate appraisal standards. USACE does not anticipate that real property will need to be acquired or leased as part of northern pike suppression efforts. To the extent that any real property is required to be acquired or leased, sponsors are encouraged to identify potential property purchases in their annual work plans so that USACE can provide guidance and insight on the documentation needed to help ensure reimbursement can be made. When using lands already within the State or Non-federal entities' control (fee or less than fee interests) they shall provide the real property interests required for the drop off station or other activities at no cost to the Government.

6.3 FINANCIAL DATA FOR RECOMMENDED ALTERNATIVE

6.3.1 Project costs

It is anticipated that USACE will execute agreements with the local tribes and the state of Washington for northern pike suppression activity cost-share. The anticipated average annual program costs range from $327,000 to $1.81 million. The Federal share of those costs would be 50 percent or $163,000 to $904,000 annually, if local and Federal funding is available.

6.4 COMPLIANCE WITH LAWS AND REGULATIONS

6.4.1 Treaties

Treaties are legally binding contracts between sovereign nations that establish the political and property relations of those nations. Treaties between Native American Tribes and the U.S. confirm the rights and privileges of each nation. In most of these

treaties, Tribes ceded title to vast amounts of land to the U.S. but reserved certain lands (reservations) and specific rights for themselves and their future generations. It is important to clarify that "the rights of sovereign Indian Tribes pre-existed their treaties; they were not granted by treaties or by the U.S government. Rather, the treaties gave these rights legal recognition" (Hunn et al. 2015:58). Like other treaty obligations of the U.S., treaties with Native American Tribes are considered “the supreme law of the land,” forming the foundation upon which Federal Indian law and the Federal Indian trust relationship are based.

Treaties with Tribes across the U.S. often established reservations and explicitly reserved to the Tribes specific rights, such as the right to hunt, fish, gather, and use natural resources within and beyond their reservation boundaries. These reserved rights may include fishing in usual and accustomed places, hunting, gathering of roots and berries, and the use of open and unclaimed lands for various purposes. These rights are fundamental to the Tribes' cultural, economic, and social practices and are protected under Federal law.

Implementation of the Recommended Alternative would be generally supportive of Treaty resources as it would benefit traditional first food resources. Additionally, the Proposed Action Alternative is providing funding to Native American Tribes to further their fisheries management programs. Aiding these programs allows Native American Tribes to more effectively manage Treaty Resources within the Reservations and Ceded Lands.

6.4.2 National Environmental Policy Act

NEPA requires Federal agencies to use a systematic interdisciplinary approach to evaluate the environmental effects of a proposed Federal action prior to implementing that action. This is usually accomplished through preparation of a statement, either an EIS if the action is a major Federal action significantly affecting the quality of the human environment, or an EA if the Federal agency has not yet determined the significance of the effects.

This EA was prepared pursuant to regulations implementing NEPA, (42 United States Code [USC] 4321 et seq. and 87 FR 23453) and identifies and considers the potential environmental effects of the proposed action. The draft Finding of No Significant Impact (FONSI), this EA and all supporting appendices were made available to other Federal and state agencies, Tribes, and the public for a 30-day review and comment period from 28 March 2025 to 27 April 2025. While preparing the EA and in the public review period, USACE did not identify any impacts that would significantly affect the quality of the human environment. Therefore, compliance with NEPA would be achieved upon the signing of the FONSI. If significant impacts had been identified during public review, an EIS would have been required. Completion of an EIS and the signing of a Record of Decision would then achieve compliance with NEPA.

6.4.3 Clean Water Act

The Federal Water Pollution Control Act (33 USC § 1251 et seq., as amended) is more commonly referred to as the Clean Water Act (CWA). This act is the primary legislative vehicle for Federal water pollution control programs and the basic structure for regulating discharges of pollutants into waters of the United States (WOTUS). The act was established to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." The CWA sets goals to eliminate discharges of pollutants into navigable water, protect fish and wildlife, and prohibit the discharge of toxic pollutants in quantities that could adversely affect the environment.

Section 402 of the CWA, the National Pollutant Discharge Elimination System (NPDES) program, pertains to discharge of pollutants. Section 404 of the CWA established a program to regulate the discharge of dredged or fill material into WOTUS and Section 401 requires that any Federal activity that may result in a discharge to WOTUS must first receive a water quality certification from the state in which the activity would occur.

The proposed activities detailed in this report are not expected to require authorization under Sections 402, 404, or 401 with the exception of the application of Rotenone to eradicate newly discovered populations of northern pike in isolated waters. Non-federal entities participating in the cost-share program that apply pesticides in waters of the United States would be required to obtain the necessary NPDES permits under Section 402 of the CWA. These permits ensure that pesticide applications comply with federal water quality standards and protect aquatic ecosystems from potential harm. There are no activities anticipated that would necessitate discharge of fill into waters of the U.S.

Implementation of the Recommended Alternative would be in compliance with this Act.

6.4.4 Clean Air Act

The Clean Air Act (CAA) is the primary Federal law designed to protect human health and the environment from the effects of air pollution. The law is administered by the Environmental Protection Agency, in coordination with State, local, and Tribal governments, and the implementing regulations are codified at 40 C.F.R. Subchapter C, Parts 50-97. To protect public health and public welfare and to regulate emissions of hazardous air pollutants, the CAA requires the Environmental Protection Agency to establish NAAQS for six "criteria pollutants" that threaten human health and welfare: O_3, CO, NO_2, SO_2, $PM_{2.5}$ and PM_{10}, and Pb.

Portions of the Proposed Action Area are in maintenance for PM_{10} and $PM_{2.5}$. However, the proposed action would not lead to emissions of criteria pollutants and would not impede achievement of maintenance standards. Implementation of the Recommended Alternative would be in compliance with this Act.

6.4.5 Rivers and Harbors Act

The Rivers and Harbors Act (RHA) refers to a conglomeration of many pieces of legislation and appropriations passed by Congress since the first such legislation in

1824. The Rivers and Harbors Act of 1899 was the first Federal water pollution act in the U.S. It focuses on protecting navigation, protecting waters from pollution, and acted as a precursor to the CWA. Section 10 of the RHA of 1899 regulates alteration of and prohibits unauthorized obstruction of navigable waters of the U.S.

The proposed action is limited to northern pike control and outreach and would not involve the construction of any structure in or over any navigable water (Section 9 Compliance), or work affecting the course, location, condition, or physical capacity of such waters (Section 10 Compliance). Implementation of the Recommended Alternative would be in compliance with this Act.

6.4.6 National Historic Preservation Act

The NHPA of 1966 as amended directs Federal agencies to assume responsibility for all cultural resources under their jurisdiction. Section 106 of NHPA requires agencies to consider the potential effects of their actions on properties that are listed, or are eligible for listing, on the National Register of Historic Places. The NHPA implementing regulations, 36 CFR Part 800, requires that the Federal agency consult with the SHPO, Tribes, and interested parties to ensure that all historic properties are adequately identified, evaluated, and considered in planning for proposed undertakings.

All proposed actions, particularly any requiring ground-disturbing activity in previously undisturbed areas must first meet compliance requirements of the National Historic Preservation Act, as amended, and associated Section 106 review. Implementation of the Recommended Alternative would be in compliance with this Act.

6.4.7 Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act addresses the discovery, identification, treatment, and repatriation of Native American and Native Hawaiian human remains and cultural items (i.e., associated funerary objects, unassociated funerary objects, sacred objects, and objects of cultural patrimony).

No ground disturbance is anticipated as part of the Proposed Action Alternative; therefore, human remains and cultural items are unlikely to be disturbed. Although not expected, in the event of an inadvertent discovery during any activities associated with the Recommended Alternative, work would immediately halt, and reasonable resource protective measures would be implemented. After the area is secured, the appropriate authorities should be contacted, including local law enforcement, the land manager, appropriate SHPO, and regional Tribal groups. Implementation of the Recommended Alternative would be in compliance with this Act.

6.4.8 American Indian Religious Freedom Act

The American Indian Religious Freedom Act (42 USC § 1996) of 1978 protects the rights of Native Americans to exercise their traditional religions by ensuring access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.

No ground disturbance is anticipated as part of the Recommended Alternative; therefore, the proposed actions are expected to have no potential to affect traditional religious sites, objects or worship and traditional rites. If a ground-disturbing activity is necessary at a site, supplemental Section 106 review would be required before approval. Implementation of the Recommended Alternative would be in compliance with this Act.

6.4.9 Special Status Species and Habitats

6.4.9.1 Endangered Species Act

The ESA established a national program for the conservation of threatened and endangered fish, wildlife, and plants and the habitat upon which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the USFWS and the NMFS, as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats. Section 7(c) of the ESA and the Federal regulations on endangered species coordination (50 CFR §402.12) require that Federal agencies prepare biological assessments of the potential effects of major actions on listed species and critical habitat.

A programmatic biological assessment (PBA) was submitted to NMFS on January 2, 2025. The PBA was prepared pursuant to Section 7(a)(2) of the ESA to evaluate the effects of the U.S. Army Corps of Engineers, Walla Walla District proposed Northern Pike Control Cost Share Program in Washington and Idaho on listed species under the jurisdiction of the National Marine Fisheries Service (Appendix A). USACE concluded that the proposed actions within the PBA "may affect and are likely to adversely affect" Upper Columbia River Spring-run Chinook and Upper Columbia River steelhead. USACE further concludes the proposed action "may affect, but is not likely to adversely affect" applicable critical habitat for these species.

A programmatic biological assessment (PBA) was submitted to USFWS on January 2, 2025. The PBA was also prepared pursuant to Section 7(a)(2) of the ESA and utilized the Fish and Wildlife Service's *Streamlined Consultation Guidance for Restoration/Recovery Projects* for species under the jurisdiction of the USFWS (Appendix B). USACE determined that actions in the Program "may affect and are likely to adversely affect" Columbia Basin bull trout and Kootenai River white sturgeon at the individual level (but beneficial at the population level), and "may affect, but are not likely to adversely affect" their designated critical habitat. USACE further determined the proposed action would have "no effect" on Canada lynx, gray wolf, grizzly bear, North American wolverine, monarch butterfly, pygmy rabbit, southern mountain caribou, Mt. Rainier white-tailed ptarmigan, yellow-billed cuckoo, Spalding's catchfly, Ute ladies'-tresses, and whitebark pine as these species are not aquatic and would not be caught with northern pike during removal efforts. USACE expects biological opinions with incidental take statements in the spring of 2025.

6.4.9.2 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668-668c) prohibits anyone, without a permit issued by the Secretary of the Interior from taking bald or golden eagles, including their parts, nests, or eggs. Take is defined in the BGEPA as any attempt to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. Disturb is defined the BGEPA as, to agitate or otherwise bother a bald or golden eagle such that it is likely to cause (1) injury, (2) interference with breeding, or (3) nest abandonment.

No trees, shrubs, or other bald or golden eagle habitat is proposed to be cut or damaged as part of the proposed action. Actions would occur at previously constructed CRB river access points and facilities with ongoing operations and human activity occurring on a daily basis (recreational boating and fisherman angling). Any eagles present near action sites would be habituated to existing human presence and operational noise levels and temporary increases in these are unlikely to measurably disturb eagles. Therefore, there would be no take of bald or golden eagles. Implementation of the Recommended Alternative would be in compliance with this Act.

6.4.9.3 Migratory Bird Treaty Act

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

No trees, shrubs, or other migratory bird habitat is proposed to be cut or damaged as part of the proposed action. Actions would occur at previously constructed dam facilities with ongoing operations and human activity occurring on a daily basis. Any migratory birds present near action sites would be habituated to existing human presence and operational noise levels, and/or would be able to disperse away for activities and temporary increases in these are unlikely to measurably disturb migratory birds. The proposed action would not result in take or negatively impact migratory bird species or their habitat subject to the Act. Implementation of the Recommended Alternative would be in compliance with this Act.

6.4.9.4 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) requires Federal agencies to consult with the USFWS, NMFS, and appropriate state wildlife agencies whenever a Federal action proposes to control or modify any body of water to ensure that fish and wildlife resources are given full consideration in project planning. The proposed measures — monitoring (telemetry, eDNA), suppression (electrofishing, hook and line, netting), targeted eradication (chemical intervention), drawdown surveying of existing lakes, public outreach, and incentivized angler engagement—focus on biological and behavioral management rather than altering water bodies through infrastructure projects

or physical modifications such as dam construction, dredging, or channelization. Drawdown surveys are conducted during normally scheduled drawdowns, and no waterbody would be drawn down for the purpose of a survey. Consequently, these activities do not meet the threshold of "modifying a body of water" as defined under the Fish and Wildlife Coordination Act, which is typically triggered by structural modifications or permanent alterations that would significantly affect water flow, levels, or habitats. Implementation of the Recommended Alternative would be in compliance with this Act.

6.4.9.5 Magnuson–Stevens Fishery Conservation and Management Act of 2007

The Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended in 1996 and 2007 (MSA), is the primary law that governs marine fisheries management in U.S. Federal waters. The MSA established:

- A fishery conservation zone between the territorial seas of the U.S. and 200 nautical miles offshore;
- An exclusive U.S. fishery management authority over fish within the fishery conservation zone (excluding highly migratory species);
- Regulations for foreign fishing within the fishery conservation zone through international fishery agreements, permits, and import prohibitions; and
- National standards for fishery conservation and management and eight regional fishery management councils to apply those national standards in fishery management plans.

Congress enacted the 1996 amendments to the Act, known as the Sustainable Fisheries Act (SFA) (P.L. 104-297), to address the substantially reduced fish stocks that declined as a result of direct and indirect habitat loss. The SFA requires that Federal agencies consult with NMFS concerning actions that may adversely impact Essential Fish Habitat (EFH).

In 2007, President Bush signed the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006. It mandates the use of annual catch limits and accountability measures to end overfishing, provides for fishery management by a limited access program, and calls for increased international cooperation.

The MSA is designed to manage and conserve marine fisheries and their habitats in U.S. Federal waters and requires Federal agencies to consult with the NMFS on actions that may adversely affect EFH. The Proposed Action Alternative would be located inland, away from marine habitats. Implementation of the Recommended Alternative would be in compliance with this Act.

6.4.9.6 State Species Conservation Cooperation

- Flood Control Act Section 4
- Fish and Wildlife Conservation Act
- Executive Order 12962, Recreational Fisheries
- Executive Order 11643, Environmental Safeguards on Activities for Animal Damage Control on Federal Lands
- Executive Order 11870, Environmental Safeguards on Activities for Animal Damage Control on Federal Lands
- Executive Order 11917, Animal Damage Control on Federal Lands
- Federal Water Project Recreation Act
- ER 1130-2-540, Environmental Stewardship Operations and Maintenance Policies

The Recommended Alternative would comply with the Acts, Executive Orders, and state laws or plans for the protection or conservation of fish and game and by its very nature as an invasive predator removal program functions as enhancement or added conservation actions. Implementation of the Recommended Alternative would comply with these Acts and Executive Orders.

6.4.10 Executive Order 11988, Floodplain Management

This Executive Order outlines the responsibilities of Federal agencies in the role of floodplain management. Each agency must evaluate the potential effects of actions on floodplains and avoid undertaking actions that directly or indirectly induce development in the floodplain or adversely affect natural floodplain values.

The proposed action would not further alter the floodplain. Implementation of the Recommended Alternative would comply with this Executive Order.

6.4.11 Executive Order 11990, Protection of Wetlands

This order directs Federal agencies to provide leadership in minimizing the destruction, loss, or degradation of wetlands. Section 2 of this order states that, in furtherance of NEPA, agencies shall avoid undertaking or assisting in new construction located in wetlands unless there is no practicable alternative.

No wetlands would be impacted by the proposed action. Implementation of the Recommended Alternative would comply with this Executive Order.

6.4.12 Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks

This Executive Order of 1997 directs Federal agencies to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

Implementation of the Recommended Alternative would comply with this Executive Order.

6.5 COORDINATION, CONSULTATION, AND PUBLIC INVOLVEMENT

6.5.1 Scoping

In preparation for developing this LR/Programmatic EA, technical staff from local tribes and the state of Washington provided information on their respective northern pike suppression programs and reviewed and consulted on the development of data summaries and other sections of the document during development.

6.5.2 Public and Agency Coordination

USACE provided a Draft LR/ EA and Draft FONSI to Federal and state agencies, Tribes, and the public for a 30-day review and comment period beginning on 28 March 2025. All comments received will be answered by USACE prior to completing final documentation for this program.

The documents are available on the USACE Walla Walla District website, https://www.nww.usace.army.mil/Missions/Environmental-Compliance/.

6.5.3 Tribal Consultation

Tribal governments consulted includes the Confederated Tribes of the Colville Reservation, the Spokane Tribes of Indians, the Coeur d'Alene Tribe, the Kalispel Tribe of Indians, and the Kootenai Tribe of Idaho.

6.5.4 Public Comments Received and Responses

Any substantial comments received through the public involvement process and actions taken to involve the public and agencies would be listed in this section.

SECTION 7 - DISTRICT ENGINEER RECOMMENDATION

The U.S. Army Corps of Engineers, Walla Walla District has conducted an environmental assessment in accordance with the National Environmental Policy Act of 1969, as amended. The draft Integrated Letter Report and Programmatic Environmental Assessment (LR/Programmatic EA), dated March 2025, addresses the feasibility of Federal interest in cost sharing northern pike suppression in the study area.

The recommendations contained herein reflect the information available at this time and current departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to higher authority as proposals for authorization and implementation funding. However, prior to transmittal to higher authority, the non-Federal entity, the states, interested Federal agencies, and other parties would be advised of any modifications and would be afforded an opportunity to comment further.

The draft LR/Programmatic EA evaluated two alternatives (Alternative 1, No Action Alternative, and Alternative 2, Comprehensive Adaptive Improvements – Cost-Shared Northern Pike Suppression). The Recommended Alternative is Alternative 2 and includes the following measures (as outlined in Section 3.4, Description of Measures Carried Forward) for cost share:

- Monitoring Actions:
    - Telemetry
    - Environmental DNA (eDNA)
- Suppression Actions:
    - Electrofishing
    - Hook and Line
    - Netting
- Eradication Actions:
    - Chemical Intervention
- Drawdown Surveying:
    - Surveys During Drawdowns of lake levels
- Public Outreach:
    - Holistic Ecosystem Management Partnership
    - Community-Based Monitoring Initiative
    - Public Education
- Reward Program:
    - Incentivized Angler Engagement Program

All applicable laws, Executive Orders, regulations, and local government plans were considered in the evaluation of the alternatives. The Recommended Alternative does not constitute a major Federal action that would significantly affect the quality of the human environment; therefore, an Environmental Impact Statement is not recommended (refer to Finding of No Significant Impact/FONSI).

SECTION 8 - REFERENCES

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