RECLAMATION

Managing Water in the West

Draft Environmental Assessment

Cayuse Cove Slope Stabilization

Lake Roosevelt, Grand Coulee Project, Washington

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Boise, Idaho

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U.S. DEPARTMENT OF THE INTERIOR

PROTECTING AMERICA'S GREAT OUTDOORS AND POWERING OUR FUTURE

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MISSION OF THE BUREAU OF RECLAMATION

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Acronyms and Abbreviations

Acronym or Abbreviation	Meaning
ACB	Articulated concrete block
ACHP	Advisory Council on Historic Preservation
APE	Area of potential effect
BIA	U.S. Bureau of Indian Affairs
BPA	Bonneville Power Administration
CCT	Confederated Tribes of the Colville Reservation
CG	Lake Roosevelt Spokane Arm Cooperating Group
CO	Contracting Officer
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DAHP	Washington State Department of Archaeology and Historic Preservation
dB	decibel
DPS	Distinct population segment
EA	Environmental assessment
Ecology	Washington Department of Ecology
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FCRPS	Federal Columbia River Power System
FONSI	Finding of No Significant Impact
ITA	Indian Trust Assets
JARPA	Joint Aquatic Resource Permit Application
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	NOAA National Marine Fisheries Service
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
PCB	Polychlorinated biphenyls
Reclamation	U.S. Bureau of Reclamation
SHPO	State Historic Preservation Officer
Spokane Tribe	Spokane Tribe of Indians

Acronym or Abbreviation	Meaning
SWPA	Systemwide Programmatic Agreement for the Management of Historic Properties Affected by the Multipurpose Operations of Fourteen Projects of the Federal Columbia River Power System for Compliance with Section 106 of the National Historic Preservation Act
TCP	Traditional cultural property
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Load
USDA	U.S. Department of Agriculture
NRCS	USDA Natural Resources Conservation Service
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
VE	Value engineering
WDFW	Washington Department of Fish and Wildlife

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1 Introduction

This environmental assessment (EA) analyzes the potential impacts from the construction of a slope stabilization system on approximately 950 feet of actively eroding shoreline on the south shore of the Spokane Arm of Lake Roosevelt in Lincoln County, northeastern Washington (see Figure 1 for location map). The Bureau of Reclamation (Reclamation) and Bonneville Power Administration (BPA) are lead Federal agencies of the Federal Columbia River Power System (FCRPS) Project and are responsible for the operation and maintenance of Grand Coulee Dam, which impounds waters of the Columbia River to form Franklin Delano Roosevelt Reservoir (Lake Roosevelt). The shoreline of Lake Roosevelt comprises lands that were withdrawn from the public domain by Reclamation for the purposes of dam and reservoir construction and operations. These Federal lands are now jointly managed under the Lake Roosevelt Cooperative Management Agreement, otherwise known as the Five-Party Agreement (Five-Party 1990). The five managing partners are Reclamation, the National Park Service (NPS), Confederated Tribes the Colville Reservation (CCT), Spokane Tribe of Indians (Spokane Tribe), and the U.S. Bureau of Indian Affairs (BIA). The southern bank of the Spokane Arm, including associated recreational facilities, is managed by the NPS as the Lake Roosevelt National Recreation Area. The north bank is located within the Spokane Reservation and is managed by Spokane Tribe.

Separate from the Five-Party Agreement, a cooperating group consisting of members from Reclamation, BPA, the Spokane Tribe, NPS, and the Washington State Department of Archaeology and Historic Preservation (DAHP) meet regularly to work on issues associated with the effects of Grand Coulee Dam operations and maintenance on the cultural resources of the Spokane Arm of Lake Roosevelt. This FCRPS Lake Roosevelt Spokane Arm Cooperating Group (CG) identified Cayuse Cove as an area where natural and human-made causes of erosion, such as wind- and boat-induced wave action, freeze-thaw, recreational visitors, and reservoir operations, are putting sensitive cultural resources at risk. The CG identified Cayuse Cove as a priority site for preservation as a component of Reclamation and BPA's National Historic Preservation Act (NHPA) Section 106 compliance for the FCRPS.

Upon completion of this EA and associated consultation and coordination activities, the Grand Coulee Power Manager will determine whether a Finding of No Significant Impact (FONSI) will be issued or if a Notice of Intent to prepare an Environmental Impact Statement (EIS) is required for this project. Reclamation is the lead Federal agency for this project and is preparing this EA in coordination with the other members of the CG.

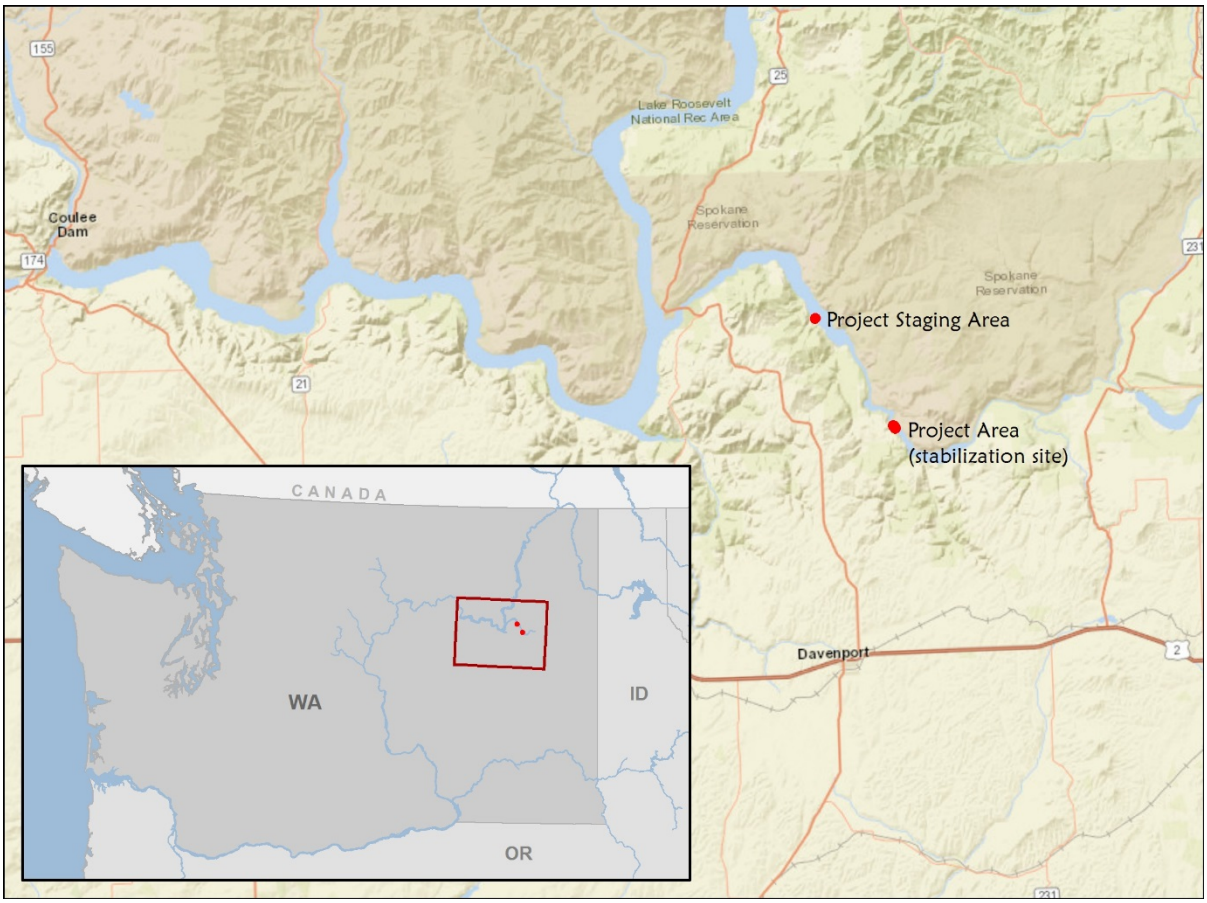

Figure 1. Location of Cayuse Cove

1.1 Purpose and Need for Action

Action is needed to halt shoreline erosion at Cayuse Cove, with minimum ground disturbance to prevent inadvertent exposure of sensitive cultural resources. The proposed action would protect the shoreline and irreplaceable resources from natural and human-caused erosion, including that from wave action, seasonal reservoir drawdowns, and boating. Wave action occurring when Lake Roosevelt is at or near the full-pool water surface elevation is destabilizing the top of the bank, causing it to erode and slump. In order to stop the erosion, it is necessary to create a barrier at the toe of the slope that will protect the shoreline and bank from the energy of the waves.

1.2 Proposed Federal Action

The proposed action would stabilize the shoreline and halt bank erosion at the Cayuse Cove project site through the installation of fill-covered gabion baskets and a cellular containment system (Geoweb, a product registered by Presto, or a similar product, hereafter referred to as Geoweb) that would be reinforced with plantings of native shrub seedlings and grass seeds. Project staging would occur approximately 8 miles downstream of the project site at Porcupine Bay Campground on Reclamation withdrawn lands that are managed by the NPS.

Construction of the slope stabilization system would occur in two phases, one in 2018 and the other in 2019. The project has been designed carefully to consider the protection of the sensitive resources both during and after construction and to retain a natural aesthetic at this important cultural site.

1.3 Project History and Planning Context

This project is an NHPA Section 106 treatment to resolve adverse effects to a historic property eligible for listing on the National Register of Historic Places. The Section 106 process is defined by the *FCRPS System-wide Programmatic Agreement for the Management of Historic Properties Affected by the Multipurpose Operations of Fourteen Projects of the Federal Columbia River Power System for Compliance with Section 106 of the National Historic Preservation Act* (SWPA; BPA, Reclamation, and Corps 2009).

In May 2009, Reclamation and Spokane Tribe Tribal Preservation Department staff conducted a geologic evaluation of shoreline erosion at 10 cultural resource sites on the Spokane Arm of Lake Roosevelt in eastern Washington. The purpose of the evaluation was to assess site conditions and processes causing bank instability and develop initial concepts for potential treatment alternatives and priorities. Following this initial evaluation, another site on the opposite shore of the Spokane River was selected as first priority (Reclamation 2011). Reclamation completed that stabilization project in 2016. During subsequent planning meetings, the FCRPS Spokane Arm CG identified Cayuse Cove as the next priority site with at-risk cultural resources. Initial design work on Cayuse Cove began during the first quarter of 2014, and the CG has worked through several iterations of the project design over the past 3 years. The nature and extent of the proposed treatment addressed in this EA are based largely on the results of the stakeholder input through the CG.

1.4 Public Involvement

Internal scoping was completed by the FCRPS Lake Roosevelt Spokane Arm CG during project conception, through design, and while initiating preparation of the EA. The CG discussed project issues and methods to prevent further erosion; potential exposure of sensitive cultural resources was discussed during a series of meetings and site visits.

The primary issues of concern are the continued erosion of the shoreline at Cayuse Cove and the associated potential for exposure and loss of cultural resources. Other issues of concern the CG identified include the potential effects of the proposed action on soils, recreation, water quality, vegetation, wildlife, threatened and endangered species, environmental justice, noise, and air quality.

These concerns are addressed below in this draft EA. The draft EA will be made available on the Reclamation website for public review, and an informal public review period will take place for 2 weeks.

1.5 Regulatory Compliance

This section summarizes the various laws, Executive Orders, and Secretarial Orders that apply to the proposed action. The legal and regulatory environment within which the Federal activity would be conducted depends on which alternative is implemented.

1.5.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires that the action agency use a public disclosure process to determine whether there are any environmental impacts associated with proposed Federal actions. If there are no significant environmental impacts, Reclamation can sign a Finding of No Significant Impacts (FONSI) to complete the NEPA compliance.

1.5.2 Endangered Species Act (1973)

The Endangered Species Act (ESA) requires that all Federal agencies ensure that their actions do not jeopardize the continued existence of listed species, or destroy or adversely modify their critical habitat. As part of the ESA's Section 7 process, an agency must request information from the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries) on whether any threatened and endangered species occur within or near the action area. The agency then must evaluate impacts to those species. If the action could affect any listed species, the agency must consult with the USFWS or NOAA Fisheries regarding the agency's proposed action to ensure that the action would not jeopardize populations of listed species or destroy or adversely modify their critical habitat.

1.5.3 Clean Water Act (33 U.S.C. 1251 et seq.)

Section 404 of the Clean Water Act (CWA) regulates the discharge of dredge and fill materials into waters of the United States, including wetlands. The U.S. Army Corps of Engineers (Corps) oversees and issues Section 404 dredge and fill permits. Permit review and issuance follows a sequence process that encourages avoidance of impacts first, followed by minimizing any impacts and, finally, requiring mitigation for unavoidable impacts to the aquatic environment. This sequence is described in the guidelines at Section 404(b)(1) of the CWA. The Joint Aquatic Resource Permits Application (JARPA) process would identify and document all required mitigation to protect the water quality in Lake Roosevelt during the construction of the proposed action.

1.5.4 National Historic Preservation Act of 1966

Section 106 of the National Historic Preservation Act (NHPA), as amended, requires that Federal agencies consider the effects that their projects have on properties that are currently listed or are eligible for listing on the National Register of Historic Places. Regulations implementing Section 106 of NHPA, 36 CFR Part 800.8, encourage the coordination of two processes: (1) the review of possible impacts on the environment under NEPA, and (2) the assessment of effects of undertakings required under NHPA.

These regulations provide procedures that Federal agencies must follow to comply with the NHPA. For any undertaking, Federal agencies must determine if there are properties of National Register quality in the project area, if so, the effects of the project on those properties, and the appropriate mitigation for adverse effects. In making these determinations, Federal agencies are required to consult with the State Historic Preservation Office (SHPO), Native American tribes with a traditional or culturally significant religious interest in the study area, the interested public and, in certain cases, the Advisory Council on Historic Preservation (ACHP).

1.5.5 Executive Order 13007: Indian Sacred Sites

Executive Order 13007, dated May 24, 1996, instructs Federal agencies to promote accommodation of access to, and protect the physical integrity of, American Indian sacred sites. A sacred site is a specific, discrete, and narrowly delineated location on Federal land. An Indian tribe or an Indian individual determined to be an appropriately authoritative representative of an Indian religion must identify a site as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion, provided that the tribe or individual is an appropriate authoritative representative of an Indian religion.

1.5.6 Secretarial Order 3175: Department Responsibilities for Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States (with the Secretary of the Interior acting as trustee) for Indian tribes or Indian individuals. Examples of ITAs are lands, minerals, hunting and fishing rights, and water rights. In many cases, ITAs are on-reservation; however, they may also be found off-reservation.

The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or Indian individuals by treaties, statutes, and Executive Orders. These rights are sometimes further interpreted through court decisions and regulations. This trust responsibility requires that officials from Federal agencies, including Reclamation, take all actions reasonably necessary to protect ITAs when administering programs under their control.

1.5.7 Executive Order 12898: Environmental Justice

Executive Order 12898, dated February 11, 1994, instructs Federal agencies, to the greatest extent practicable and permitted by law, to make achieving environmental justice part of their mission by addressing, as appropriate, disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. Environmental justice means the fair treatment of people of all races, income, and cultures with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment implies that no person or group of people should shoulder a disproportionate share of negative environmental impacts resulting from the execution of environmental programs.

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2 Description of Alternatives

The decision to be made involves two alternatives: either implement shoreline stabilization measures to protect the Cayuse Cove site (the Proposed Action) or take no action. The preferred method to stabilize the shoreline – a combination of fill-covered gabion baskets and a cellular containment system – was developed in coordination with the FCRPS Lake Roosevelt Spokane Arm CG. Other methods of shoreline stabilization considered but not carried through for detailed analysis are described in Section 2.3.

2.1 Proposed Action

The proposed action would stabilize the shoreline and halt bank erosion at the Cayuse Cove project area (Figure 2) through the installation of fill-covered gabion baskets and a cellular containment system (Geoweb, a product registered by Presto, or a similar product) that would be reinforced with plantings of native shrub seedlings and grass seeds. The project was designed to substantially reduce the need for ground disturbance, and no disturbance beyond that included in the final design would be allowed unless explicitly authorized by the Reclamation Contracting Officer (CO). The majority of construction materials would be placed on top of engineered fill in order to protect the sensitive resources present at the project area. Project staging would occur approximately 8 miles downstream of the project area (Figure 2). Construction of the slope armament would occur in two phases, one in 2018 and the other in 2019. Components of this action are detailed in Sections 2.1.1 – 2.1.5.

2.1.1 Project Area Slope Stabilization

The slope stabilization would extend horizontally at the top of existing slope, for a total overall length of approximately 950 feet (Figure 3). The width of the area to be protected would range from 70 to 130 feet, for a total stabilization area of 83,600 square feet (1.92 acres). The slope stabilization would consist of layers, beginning with gravel bedding, followed by gabion baskets, and overlain with compacting backfill and the Geoweb slope stabilization system. Finally, vegetation would be planted on top. Construction of the slope stabilization system would require several steps and would occur in two phases. Construction would be barge-based; heavy equipment would be restricted on the project site. Construction would be timed based on pool elevation so that all construction activities would occur outside of the water.

Figure 2. Cayuse Cove project area and staging area

Geoweb, or a similar cellular containment system, is proposed as the primary slope stabilization system. It is a cellular sheet made from high-density polyethylene (HDPE) that that has been in use for about 30 years in slope stabilization and other projects. The proposed cell size of the Geoweb is 12 in. by 12 in.; the proposed thickness is 8 in., and each cell would be filled with well-graded angular infill. The materials would be resilient to freeze/thaw conditions and erosion caused by wave action. The Geoweb would be held in place using a tendon-and-anchor system, as recommended by the manufacturer. Staking on native soil to secure the Geoweb would not occur; staking would be limited to areas where fill has been placed.

Gabion baskets would be installed at the crest of the slope above the Geoweb for approximately 270 feet in the western portion of the project site, where the height of the cut bank and the severity of erosion are greatest (Figure 3). In this area, gabion baskets, combined with Geoweb, would make up the slope stabilization system. As the cut bank becomes lower and less pronounced moving east, the gabion basket height would transition from two baskets high to one basket high. As the cut bank height reduces to less than 2 feet, gabion baskets would no longer be used and the Geoweb would be the only stabilization method constructed.

The bottom edge of the Geoweb slope stabilization system would be keyed in (anchored) with a minimum of 2 feet of cover. The exposed Geoweb slope stabilization would extend from the upper elevations of 1,293 feet minimum to 1,295 feet maximum, and continue downslope to elevation 1,275 feet. The buried portion of Geoweb would be limited to a minimum elevation of 1,271 feet. This would be the only area where excavation into existing site soils would occur.

The top of the Geoweb would be anchored with a combination of two methods, earth anchors and deadman anchors. Earth anchors would be installed every 3 feet for the first 15 feet at the northwest project end, and for the last 480 feet at the southeast portion of the project site. Deadman anchors would be installed every 3 feet for approximately 390 feet on the northwest portion of the project site (after the initial 15 feet of earth anchors). The earth anchors would be a Duckbill type or equivalent and would penetrate existing ground. The deadman anchors would be 4-inch-diameter PVC pipes covered with a minimum of 3 feet of compacted fill.

Construction Schedule

The project would be constructed in 2018 and 2019 during the following estimated time periods:

Phase 1: September (after Labor Day) to mid-November 2018, or until snow precludes work.

Phase 2: March to the end of May (prior to Memorial Day) 2019.

Phase 1

Phase 1 of the slope stabilization would include the following steps:

- Development of the barge landing area, loading area, and staging area at the Porcupine Bay Campground.
- Staging construction materials and equipment at the Porcupine Bay Campground – access to the staging area would be from the existing highway system and county roads.
- Gravel bedding – gravel would be brought in from an approved borrow site and compacted for a minimum 6-inch bedding for the gabion baskets
- Gabion baskets – a 270-foot-long row of gabion baskets (3 feet by 3 feet by 6 feet each) would be constructed in the northwest portion of the project site at the top of the slope to prevent soft spots where fill placement is at the greatest depth (Figure 3). These baskets would be buried with compacted backfill upon the completion of Phase I.

Figure 3. Cayuse Cove slope stabilization Phases I and II

- Compacted backfill – compacted backfill from an approved borrow site would be placed above the gabion baskets and above the existing cut bank to provide a medium to place the Geoweb.
- Geoweb installation – Geoweb (8 inches thick) or a similar product (see Figure 4 for an example of the product used) would be placed over the backfill from lake elevations between 1,293 feet and 1,295 feet (3 to 5 feet above high water, or the full-pool elevation of Lake Roosevelt) to provide slope armament. The Geoweb would be constructed top-down from the crest anchors to an elevation of 1,285 feet (Figure 5).

Figure 4. Slope stabilization application of Geoweb (partially constructed example)

Phase II

Phase II of the slope stabilization would include the following steps:

- Reactivate use of the barge landing, loading, and staging areas at the Porcupine Bay Campground.
- Geoweb installation completion – the remaining construction of the Geoweb materials would occur between elevations 1,285 feet and 1,271 feet minimum (Figure 5).
- Geoweb would be keyed in (anchored) along the entire bottom edge of the Geoweb slope stabilization at approximate elevation 1,271 feet. A 2-foot cover of fill material and 1-foot-diameter cobbles would be used to anchor the bottom edge of the Geoweb. The lower limits for construction are estimated to be no lower than elevation 1271 feet. This method of construction at the bottom would require moderate excavation.

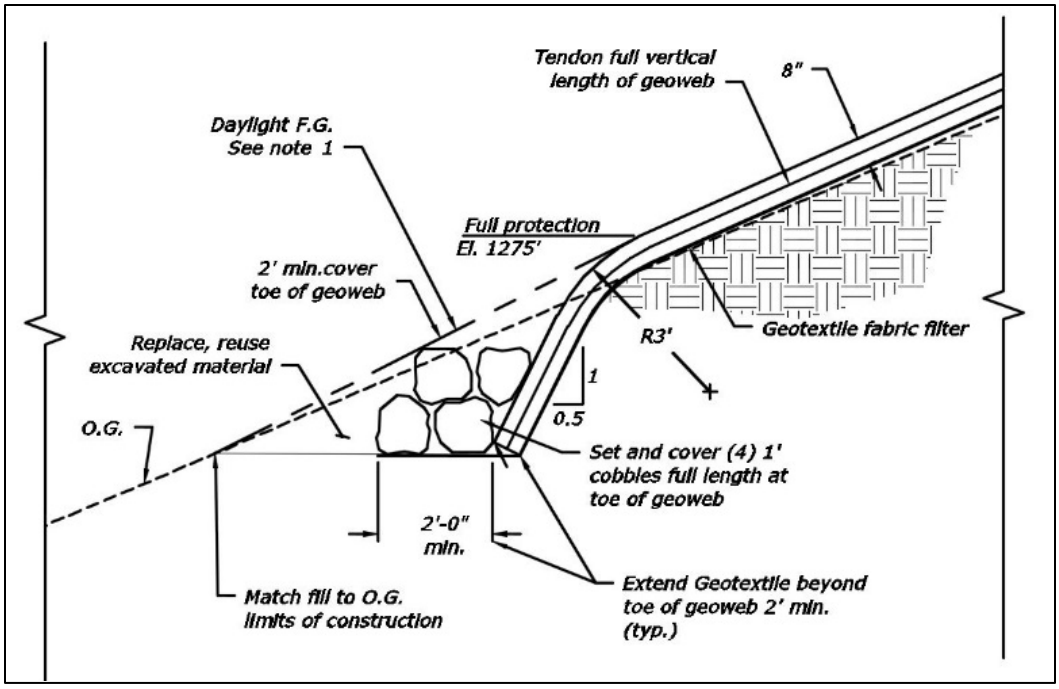

Figure 5. Geoweb – Toe of protection detail

- Topsoil would be placed from the upper limits of construction at a minimum depth of 9 in. above the Geoweb and compacted backfill. Topsoil would be placed on the Geoweb at a minimum depth of 4 in. for the top of the exposed Geoweb, and downslope to elevation 1,288 feet. Areas with minimal erosion may require less topsoil to match the elevation of the surrounding area.
- Revegetation – a combination of nursery plug native shrub seedlings, native grass seeds, and sod mats would be planted to vegetate the stabilized shoreline over approximately 1 acre (Figure 5).
    - Approximately 3,000 native shrubs (10-cubic-inch plugs) would be planted over about a 0.6-acre area at a spacing of 3 feet in each direction, between elevations 1,292 feet and 1,300 feet.
    - Native grass seeds would be broadcast-seeded over all finished graded surfaces above elevation 1,288 feet. Seeding would occur following the planting of plant plugs.
    - Sod mats with incorporated native plugs, exposed core mats in which plugs would be planted, or other similar method (e.g., Coir logs) would be installed on the Geoweb between elevations 1,288 feet and 1,292 feet.
- Irrigation – plants would be irrigated at the project site through either installation of a temporary irrigation system or by hand-watering. Water would be drawn from the Spokane Arm with a pump outfitted with a self-cleaning fish screen. After initial watering by the contractor and testing of the irrigation system, if applicable, Reclamation or their alternate representatives would take over watering of the

plantings for a minimum of 2 years to ensure establishment and survival of the vegetation.

2.1.2 Project Staging

The staging, landing, and loading areas would be located at the NPS-managed Porcupine Bay Campground (Figure 2), approximately 8 miles downstream of the project site. The campground area consists of a boat launch, boat dock, swim beach, day-use area, toilets, and developed campsites. The swim beach, developed campsites, and road accessing the campground sites would not be used for project purposes.

Materials would be transported to the staging area by truck on state highways and county roads. Traffic would be controlled and temporary signage would be posted at all access points to the staging, landing, and loading areas for public safety. Use of the campground for staging, landing, and loading would be in compliance with terms and conditions of a NPS Special Use Permit, and would not occur during the peak recreation season (Memorial Day to Labor Day).

The staging area would be sited on about half of the campground's gravel overflow parking area (Figure 2). This approximately 0.5-acre area would be used for stockpiling construction materials and storing equipment during the construction period. The remaining portion of the gravel parking area would remain open to the public. The staging area would have dual access points, one for entry and the other for exit of vehicles.

The loading area would be located along the northern edge of the main parking lot, and possibly, a segment of the northern boat launch (Figure 2). This approximately 0.4-acre area would be used to transfer materials from the staging area to a barge at the landing area. A portion of the loading area near the boat launch may also be used temporarily for staging to improve load time.

The staging and loading areas would each be encompassed by a chain-link fence with secure gates for restricted access. The existing bathroom facility adjacent to the main parking lot would be included in the fenced loading area, for public safety. Temporary, portable toilet facilities for public use would be furnished in non-fenced areas.

The general location of the landing area, where the barge would land and launch, is shown on Figure 2. The exact location would vary within this area depending on weather conditions and water surface elevation and would be selected by the barge operator. It is assumed that the barge would make two trips or more per day from the landing area to the project site, one in the morning to load materials, and at least one mid-day to replenish materials. After-hours during the construction period, the barge would anchor at a small cove downstream of the landing area, or as directed by the NPS (Figure 2).

2.1.3 Project Design Features and Best Management Practices

The following design features and best management practices (BMPs) would be implemented by the contractor as part of the design specifications to reduce the potential for

impacts to the human and natural environment. Further detail on control methods would be detailed in the construction contract.

Dust Control

- Dust control and abatement would be provided during performance of work. Dust pollution would be prevented, controlled, and abated in work areas.
- Labor, equipment, and materials would be provided and efficient methods used wherever and whenever required to prevent dust nuisance or damage to persons, property, or activities.

Air Pollution Control

- Reasonably available methods and devices would be used to prevent, control, and otherwise minimize atmospheric emissions or discharges of air contaminants.
- Equipment and vehicles that show excessive exhaust gas emissions would not be operated until corrective repairs or adjustments reduce such emissions to acceptable levels.

Noise Control

- Noise levels of 80 decibels, as measured at noise-sensitive areas such as residences, would not be exceeded during the hours of 7:00 a.m. to 7:00 p.m. (daytime). Noise levels of 65 decibels would not be exceeded during the hours of 7:00 p.m. to 7:00 a.m. (nighttime).
- Only construction activities approved by contracting officer representative would be allowed during the hours of 7:00 p.m. to 7:00 a.m.
- Specialty mufflers would be provided for continuously running generators, pumps, and/or other stationary equipment to meet the decibel requirements above.
- Operations producing high-intensity impact noise would be performed only weekdays during the hours of 7:00 a.m. to 7:00 p.m.

Invasive Species Control

Contractors would be required to ensure that all equipment entering the project and staging areas be free of noxious weeds, invasive species, and their propagules, in accordance with State of Washington law. This includes aquatic and terrestrial (i.e., land-dwelling) species.

Water Pollution Controls

Pollutants would be controlled through the use of sediment and erosion controls, wastewater and stormwater management controls, construction site management practices, and other controls, including state and local control requirements. All controls would be implemented in a manner that does not disturb, excavate, or penetrate native soil.

Sediment and erosion controls

- Sediment and erosion control methods such as straw bales (certified weed-free) and silt barriers would be implemented.
- Stormwater management measures would be implemented as required.

Wastewater and stormwater management controls

- Pollution prevention measures:
    - Prevention measures to control silting and erosion, and which would intercept and settle any runoff of sediment-laden waters, would be used for stockpiling earth and rock materials.
    - Wastewater from general construction activities would be prevented from entering flowing or dry watercourses without the use of approved turbidity control methods.
    - Stormwater runoff from upslope areas would be diverted away from disturbed areas.
- Turbidity prevention measures:
    - Methods used for prevention of excess turbidity include, but are not limited to, gravel filter entrapment dikes, flocculating processes, combinations thereof, or other approved methods that are not harmful to aquatic life and do not disturb native soil.
    - Wastewaters discharged into surface waters shall meet conditions of the CWA Section 402 (the National Pollutant Discharge Elimination System [NPDES]) permit.
    - Prior to performing required construction for this project, discharges of dredged or fill material would meet the conditions of the Section 404 permit.

Construction site management

- Contractor construction operations:
    - Construction activities would be performed by methods that would prevent entrance or accidental spillage of solid matter, contaminants, debris, or other pollutants or wastes into the Spokane Arm.
- Stockpiled or deposited materials:
    - Construction materials would not be stockpiled or deposited near or on the shoreline, where they could be washed away by high water or storm runoff, or could in any way encroach upon the watercourse.

Petroleum product storage tanks management

- A storage containment plan would be implemented that includes provisions for double-wall tanks, plastic lining, closed-top containers, berming or containment walls, or other measures for containment of mobile equipment fuels and liquids.
- If mobile equipment would be parked on the project site (Porcupine Bay Campground), drip pans would be placed under motors or engines to catch any drips or leaks from engine casings.
- Spill containment kits would be readily available in areas where liquids, petroleum, oils, and/or lubricants would be stored, either on land sites or on the watercraft being used in the project.
- If boats will be fueled in or over water, spill containment kits would be readily available in areas where liquids, petroleum, oils, and/or lubricants are stored, either on land sites or on the watercraft being used in the project.

Shrubs and seeded areas would be irrigated for a minimum of 2 years following planting. An irrigation plan would be submitted by the contractor and approved by Reclamation prior to construction. The plan would include details for either installation of a temporary, above-ground drip-and-sprinkler irrigation system, or other methods of irrigation, such as hand-watering. Any approved method would include temporarily drawing water from the Spokane Arm via a pump to irrigate.

All plants would be watered immediately following individual planting to saturate the entire root column and would be watered daily for the first 2 days, then every other day for a maximum of 7 days after placement. After that period, further watering by Reclamation or their alternate representative would occur for a minimum of 2 years. Provisions would be included in the vegetation plan to address plants that die during the first year following planting.

Wire or plastic tubes would be erected around planted shrubs to prevent damage by browsing animals.

Fish Protection

Irrigation pump intakes would be screened to prevent fish entry into pumps. Fish screens would consist of a stainless steel intake with a perforated plate. Holes in the perforating plate would be no more than 3/32-inch diameter, and the intake would be self-cleaning.

2.1.4 Monitoring

Reclamation would contract with the Spokane Tribe Preservation Program to provide on-site cultural resources monitors for the duration of construction activities. These monitors would be present to observe the work and ensure that the plans for limited ground disturbance are followed. In the case that cultural resources are uncovered during construction work, the monitors would work with the Reclamation construction inspector and CO to protect the find

and ensure that proper protocols for inadvertent discoveries at Lake Roosevelt would be followed.

2.2 The No Action Alternative

Under the No Action alternative, Reclamation would not construct a physical slope stabilization structure along the eroding shoreline and no efforts would be made to protect sensitive cultural resources at Cayuse Cove.

2.3 Alternatives Considered but Eliminated

A cultural resources cooperating group comprising staff members from Reclamation, BPA, NPS, DAHP, and the Spokane Tribe (collectively known as the Spokane Arm CG) who work together to address the effects of Grand Coulee Dam operations and maintenance on cultural resources planned the project. The CG discussed several options to stabilize the Cayuse Cove during regular quarterly meetings from 2014 to 2017. One of the largest design and construction constraints considered in evaluating different methods was to minimize or avoid ground disturbance at the site and prohibit use of heavy equipment on the exposed shoreline. Another consideration was to apply a consistent approach to avoid altering habitat or otherwise changing the aesthetic and natural qualities of the site, since it is a part of the Lake Roosevelt National Recreation Area managed by NPS. The proposed action was developed through consideration and analysis of three slope stabilization methodologies; these include the use of Geoweb, articulated concrete block, and ecology blocks for slope stabilization. In addition, an alternative method of anchoring the top of the armament was considered.

A Value Engineering Team (VE Team) comprising engineers, an archaeologist, project managers, construction specialists, and a geologist conducted a VE study for the Cayuse Cove Slope Stabilization project. Using a 30 percent design of Geoweb slope stabilization with gabion baskets as a baseline, this study developed 10 proposals for completing the project objectives. In evaluating the proposals, the team considered issues of concern to internal and external project stakeholders, design assumption and constraints, and construction restrictions and limitations, and evaluated costs, potential risks, advantages, and disadvantages of each proposal. Each proposal consisted of a variant of the project baseline, including different methods of slope stabilization, revegetation, construction management, phasing, anchoring, and staging. Following completion and presentation of the VE study, the CG agreed upon a preferred alternative for final design, which is the Proposed Action in this EA.

Through careful consideration of the different alternatives available while considering the project purpose and need, the Geoweb method of slope stabilization with gabion baskets was considered to be the preferred method, and was therefore carried through to final in the engineering design. The other slope stabilization methods considered – articulated concrete

block and ecology blocks – were eliminated from full analysis and design and are described briefly below.

2.3.1 Use Reno Mats Instead of Geoweb for Slope Stabilization

This proposal considered using Reno mats instead of Geoweb for slope stabilization. This option was eliminated primarily due to the difference in aesthetic qualities between the two methods. Reno mats are made of wire cages, which would be exposed and more visually prominent than the plastic webbing of Geoweb. In addition, use of Reno mats would be substantially more expensive than Geoweb (more than 30 percent increase in cost).

2.3.2 Use Articulated Concrete Block Instead of Geoweb

This proposal considered using articulated concrete block (ACB) instead of Geoweb for slope stabilization. This option was dropped due to safety concerns, aesthetics, and revegetation. Construction of the ACB would require a crane or large extended-reach excavator on the barge, which could pose stability issues and associated safety concerns. The ACB, once installed, would be visually unnatural, consisting of a large exposed expanse of concrete blocks on an otherwise natural shoreline. The spaces between the blocks would be planted with native vegetation, similar to plantings with the Geoweb; however, the spaces between the blocks would be smaller than those of the Geoweb, making them less conducive to planting. This proposal would also result in additional costs (more than 12 percent increase) compared to the Geoweb option.

2.3.3 Use Riprap Instead of Geoweb

Riprap was discussed as an alternative to Geoweb for slope stabilization early on in the design process, prior to the VE study. This option was dismissed due to aesthetic and invasive species concerns and previous stakeholder input. Riprap does not blend with the landscape along the Spokane Arm of Lake Roosevelt, and crevices in the riprap provide potential habitat for invasive species such as northern pike. Further, this option would not be conducive to planting; thus, vegetation would not establish on the bank.

2.3.4 Use Ecology Blocks Instead of Gabion Baskets

This proposal considered using ecology blocks instead of gabion baskets at the slope crest and would result in only a 2 percent cost savings over the Proposed Action. This option was dropped primarily due to the need for heavy equipment to set the blocks in place. Construction of the blocks would require a crane or large extended-reach excavator on the barge, which would limit the flexibility of the construction schedule due to the dependence on pool levels. Additionally, there would be a risk of the weep holes in the blocks becoming plugged, which could cause drainage issues.

2.3.5 Eliminate Gabion Baskets and Use 4-inch Pipe Crest Anchor Detail

This proposal was dismissed, as the use of gabion baskets along the cut bank edge of the west side of the project site is critical to controlling erosion and stabilizing the slope. The gabion baskets would provide structural stability for the crest of the slope, where the most bank erosion has occurred. Further, eliminating the baskets would require additional compaction of fill with a vibratory compactor, which could increase the risk of bank erosion and collapse during construction.

Pipe crest anchors were proposed above the gabion baskets. Replacing the gabion baskets with only the crest anchors would not meet the purpose and need of the project.

2.4 Comparison of Alternatives

Table 1. Summary Comparison of Alternatives and Potential Impacts to the Affected Environment

	Proposed Action	No Action
Soils	There would be minor, short-term, localized disturbance and compaction of soils immediately adjacent to the site during installation of the stabilization structure. Over the long term, site stabilization would protect soils from further erosion due to wave action, lake fluctuations, and other influences.	Over the long term, soil and parent material would continue to be undercut by wave action, leading to erosion, slumping, and movement downslope into Lake Roosevelt. The affected area is small; thus, the soil loss impacts would also be small.
Recreation Values and Uses	There would be temporary displacement of visitors and additional crowding at the boat ramp at the Porcupine Bay Campground during the construction window. Additional congestion along waterway would occur due to use of barge. Impacts would be outside of peak recreation season.	No Effect
Water Quality	Reduction in soil erosion and sediment loading into the Spokane Arm would occur.	Continued soil erosion and sediment loading into the Spokane Arm would occur.
Vegetation	There would be minor, short-term, localized disturbance and compaction of vegetation immediately adjacent to the site during installation of the stabilization structure. The majority of existing vegetation was severely burned in the 2016 Hart Fire. Disturbed and stabilized areas would be seeded or planted with native species to help stabilize soils and improve the appearance of the completed project.	Over the long term, as soil is lost from the site, the ability of the site to support vegetation would diminish. Given the small size of the affected area, the impacts to vegetation would be small.

	Proposed Action	No Action
Wildlife	There would be minor, short-term, localized disturbance of wildlife habitat immediately adjacent to the site during installation of the stabilization structure. Disturbed and stabilized areas would be seeded or planted with native species to help restore habitat values. Due to the severity of the 2016 Hart Fire, there has been a reduction in the available habitat for wildlife and foraging.	Over the long term, as soil and vegetation are lost from the site, the ability of the site to provide wildlife habitat would continue to diminish. Given the small size of the affected area, the impacts to wildlife habitat and species would be small.
Fisheries	There would be minor, short-term, localized disturbance to fish from barges anchoring near the shoreline. Fish that may occupy the area would likely relocate during construction activities. There is no suitable spawning habitat in the area due to slope and sediment type; therefore, spawning habitat would not be impacted.	Continued bank erosion would likely affect water quality in the form of suspended sediment and could affect availability of fish food sources. Vegetation would not be planted and thus shade habitat for fish would not be created.
Threatened and Endangered Species	No listed or sensitive species are known to occur at the site.	No listed or sensitive species are known to occur at the site.
Cultural Resources	The proposed action would provide long-term protection of the Cayuse Cove archaeological site from erosion.	Long-term substantial effects would occur, including loss of irreplaceable cultural resources due to reservoir erosion.
Sacred Sites	No Effect	No Effect
Indian Trust Assets	No Effect	No Effect
Environmental Justice	No Effect	No Effect
Noise, Air Quality, Health and Safety	Temporary, short-term air quality and noise impacts would occur due to construction activities. Effects would be mitigated using BMPs.	No Effect

3 Affected Environment and Environmental Consequences

This chapter describes existing physical, biological, natural, social, and cultural resources that could be affected by the action and identifies potential impacts, beneficial or adverse, to those resources that could result from each of the two alternatives.

The Affected Environment section describes the existing environment upon which the alternatives could have an effect, and the Environmental Consequences section describes the potential direct and indirect effects of those alternatives, if implemented, on the resources evaluated. This EA also discusses cumulative effects, which are effects that may result from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects will only be addressed for those resources where direct or indirect effects would be realized.

The No Action alternative describes the conditions of a specific resource if Reclamation takes no action and provides the basis to compare the action alternative (Alternative 1).

Preliminary analysis indicated that the bank stabilization project has no potential to affect a certain resource or is anticipated to affect certain resources to such a limited extent that a detailed discussion of those resources is not justified. Resources that were determined to be unaffected by the Proposed Action are summarized in Table 2. Resources or uses that may be affected by the No Action Alternative or the Proposed Action are analyzed in the remainder of this chapter.

Table 2. Resources eliminated in the Impact Analysis

Resource	Rationale For Elimination
Air Quality	There would be a slight increase in exhaust emissions from construction vehicles and worker transport. Proper maintenance of equipment would prevent any increase in regulated air-quality parameters over established limits. Best Management Practices (BMPs) implemented as part of the project would avoid measurable air quality impacts. Examples of appropriate BMPs include dust suppression during construction, maintaining construction equipment exhaust emission controls according to manufacturer's instructions, and reducing emissions through carpooling of workers.
Climate Change	Climate change is not evaluated in this EA because the project would be short in duration and its impacts to climate change would not be measureable.
Energy	No disruption of power supply would occur under either alternative. Energy supplies would also not be impacted by the alternatives. Therefore, energy use is not addressed further in this EA.
Hazardous Materials and Waste	No hazardous contamination conditions are known to exist within the project and staging areas. Hazardous materials are discussed in the Water Pollution Control section above and would be mitigated through BMPs. Therefore, hazardous materials and wastes are not addressed in this EA.

Resource	Rationale For Elimination
Infrastructure	There is no infrastructure within the areas to be used by the project under either alternative, and no infrastructure would be impacted by related actions; therefore, infrastructure is not addressed further in this EA.
Land Use	Land use would not change under either alternative or with implementation of the related actions; therefore, land use is not addressed further in this EA.
Public Health and Safety	There are no public health and safety concerns related to this project and therefore it is not addressed in this EA.
Realty	There are no realty-related issues for this project and therefore it is not addressed in this EA.
Visual Resources	There would be a temporary change to visual resources at the staging area and project site during construction. The slope protection system may be partially visible during drawdown of the lake until the vegetation becomes established. This short-term impact would occur over a small area; therefore, visual impacts are not further addressed in this EA.
Water Rights	Water for irrigating newly planted vegetation would be provided via Reclamation's water right.
Wild and Scenic Rivers	There are no Wild and Scenic Rivers in the project area; therefore, Wild and Scenic Rivers are not addressed further in this EA.
Wilderness	There is no wilderness in or near the project area.

3.1 Soils

This section describes current surficial geology, including soils, at the Cayuse Cove bank stabilization site. It also examines potential effects of each alternative on shoreline soils.

3.1.1 Affected Environment

The slope stabilization site would extend horizontally at the top of existing slope, for a total overall length of approximately 950 feet. The width of the area to be protected would range from 70 to 130 feet, for a total stabilization area of 83,600 square feet (1.92 acres). The terrace at Cayuse Cove is 10 feet above the high pool elevation of Lake Roosevelt at elevation 1290 feet. The material at the toe of the terrace is composed of alluvial material consisting of sand and gravel with cobbles (USDA NRCS 2017). At the top of the terrace, the material consists of fine-grained sand and silt with fine gravel and cobbles (Figure 6). The bank material has little shear strength and is easily erodible. Wave action, most likely from wind and recreational boating, has caused significant erosion at the contact between the two terrace materials.

Figure 6. The material at the terrace is composed of alluvial material consisting of sand and gravel with cobbles

3.1.2 Environmental Consequences

Proposed Action

The bank stabilization project would result in minor short-term disturbances to soils adjacent to the site as the stabilization structure is installed. The project would lead to long-term stabilization of the soils and shoreline bank protection. Material for gabion baskets, topsoil, and fill would be obtained from an approved borrow source or quarry. Soil composition would also change due to the high volume of fill used for stabilization. Soil composition would consist of 2.5 inches of gravel fill, 0.5-inch of compacted fill, and topsoil for revegetation.

No Action

Under the No Action Alternative, the soils that make up the shoreline would continue to be eroded by wave action. This would lead to the bank slumping and moving into Lake Roosevelt and continued sediment loading into the Spokane Arm.

Cumulative Effects

Recreational activities, especially boating, are prevalent in and adjacent to the Spokane Arm. All of these activities are expected to continue in the future. In the analysis area, recreation will likely increase in the future, which would likely increase erosion and sediment loading into the river. Very little, if any, increase in sediment loading to the Spokane Arm would be anticipated during implementation of the proposed project, and the addition of vegetation

would stabilize the soil and reduce erosion. Since the project would improve resilience at the site and reduce sediment loading into the Spokane Arm, long-term beneficial effects to water quality would be anticipated, which would reduce cumulative effects.

3.2 Recreation Values and Uses

3.2.1 Affected Environment

Recreational opportunities along the Spokane Arm are managed by the National Park Service as part of the Roosevelt National Recreation Area and by the Spokane Tribe on tribal lands. The river is a popular location for boating, fishing, and water sports. Available game fish species include rainbow trout, kokanee, walleye, yellow perch, and smallmouth bass. The fishing season is open year-round, except for sturgeon, which is closed year-round. The entire river right shoreline is part of the Spokane Indian Reservation, and users are subject to Spokane Tribal fees and rules.

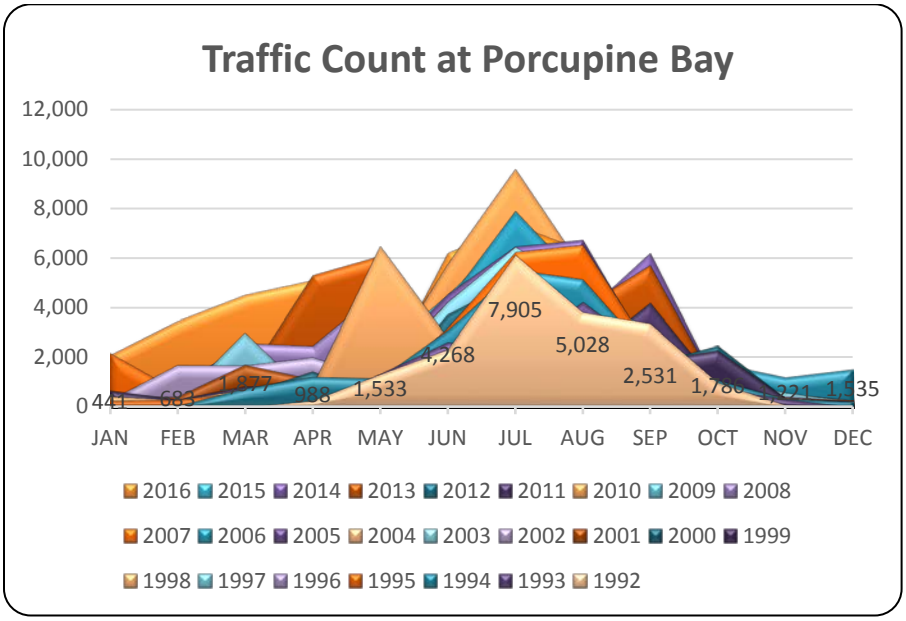

Figure 7. Traffic counts at Porcupine Bay

Developed recreation facilities on the Spokane Arm nearest the project and staging areas include Detillion, Ponderosa, and Porcupine Bay campgrounds. These facilities are managed by the National Park Service as part of the Lake Roosevelt National Recreation Area. Porcupine Bay is located 19 miles north of Davenport on State Highway 25 and is the closest developed site to Spokane, a major metropolitan area. Porcupine Bay, which is proposed for project staging activities, is approximately 8 miles downstream of Cayuse Cove. This highly used recreation site has 31 RV/tent sites. Recreational amenities include swim beach, boat dock, fishing, playground, horse shoes, picnic tables, an RV dump station, and ranger-guided programs in summer.

Traffic counts collected at Porcupine Bay are used to extrapolate visitor use numbers and track user trends over time. Traffic counts provided by the National Park Service (Edwards 2017) demonstrate use trends between 1992 and 2016. Traffic counts have grown from 6,102 in 1992 to 9,589 in 2010. The greatest visitation occurs in July and August in each year, with smaller peaks taking place in April and May. The 5-year averages for July and August are approximately 6,167 and 4,507 respectively. The 5-year averages are 2,989 in April and 2,936 vehicles in May. During September, the 5-year average is 4,167 vehicles.

According to The Upper Columbia River Recreational Use Survey (Scherer 2013), visitors travel a median of 75 miles and spend an average of 3.4 visitor days per year in the area. Recreational issues that were identified in the National Park Service's General Management Plan (NPS 2000) included the lack of available campsites at popular facilities and overcrowding at the boat ramps. Concerns were also expressed about boating safety and lack of boating regulations. According the General Management Plan, "carry capacity is most often limited by the amount of area required for active water sports." The area identified as being sensitive to overcrowding was the Spokane Arm of the reservoir, where the channel is narrow and active water sports are popular (NPS 2000). Visitor use characteristics, as defined in the 2013 recreational use survey, demonstrated that nearly twice as many visitors participated in water sports, including swimming and water skiing in the lower region of the upper Columbia River, between the Grand Coulee Dam and the Spokane River confluence, than in the middle or upper region of the park (Scherer 2013). Other recreational activities were comparable.

3.2.2 Environmental Consequences

Proposed Action

Staging, landing, and loading areas would occupy approximately half of the overflow parking and boat ramp at Porcupine Bay outside of the peak recreational months of June through August. There would be moderate, short-term, direct impacts to visitors at the campground during the construction window. Some visitors would be temporarily displaced, and staging would disrupt normal recreational activities prior to the Memorial Day and after Labor Day. Visitors would see a reduction of the total parking spaces available and experience additional crowding at the boat ramp. The greatest impacts would be seen during the months of April and September; there would be no impacts during the peak recreational period.

The slow-moving barge would add to the crowded waterway and could obstruct faster-moving watercraft. This would be a minor short-term impact and would cease upon completion of construction.

No Action

Under the No Action Alternative, no construction activities would occur. Therefore, there would be no displacement or disruption of visitors from the associated construction activities.

Cumulative Effects

Implementing the Proposed Action or No Action Alternative would not result in cumulative impacts to recreational opportunities in the area. The short-term impacts at Porcupine Bay Campground would be limited in scope and would cease at the conclusion of the project.

3.3 Water Quality

3.3.1 Affected Environment

Water quality of Lake Roosevelt is regulated by the State of Washington Department of Ecology (Ecology) under the framework of the Clean Water Act. Washington has established water quality standards for specific physical and chemical parameters in order to provide suitable conditions to support designated and potential uses. Some of these uses include agricultural water supply, domestic water supply, stock water supply, industrial water supply, commercial navigation, boating, wildlife habitat, harvesting, and aesthetics (Ecology 2016a). The designated uses of Lake Roosevelt include core salmonid summer habitat and extraordinary primary contact recreation, as well as nine additional standard uses. Extraordinary primary contact recreation is a designated use for some high-quality or special waters of the state. This designation and the associated water quality standards provide more stringent protection against waterborne disease than primary contact recreation standards.

Section 303(d) of the Clean Water Act requires states and tribes to identify water bodies that do not meet water quality standards. States and tribes must publish a list of these impaired waters every 2 years. The most recent approved 303(d) list for the State of Washington is the 2012 Integrated Report approved by U.S. Environmental Protection Agency on July 26, 2016 (Ecology 2016b). For lakes, rivers, and streams on this list, states and tribes must develop water quality improvement plans known as total maximum daily loads (TMDLs). These TMDLs establish the amount of a pollutant a water body can carry and still meet water quality standards. Water temperature was identified as one of the primary water quality problems in the Columbia River segments near Grand Coulee Dam, while low dissolved oxygen and PCBs (a persistent organic pollutant with toxicities similar to dioxins) were also identified as water quality concerns.

Tributary streams and rivers in the upper basin of the Columbia River, as well landslides and erosion of unconsolidated sediments from the reservoir rim, deposit sediments in Lake Roosevelt (USGS 2002). Landslides and erosion along Lake Roosevelt have occurred and continue to occur, primarily in the unconsolidated Pleistocene terrace sediments present along 80 to 90 percent of the reservoir shoreline (Jones et al. 1961; Kiver and Stradling 1995; Bjorklund 2015). A massive landslide occurred on April 2, 2017, that is blocking access to Lake Roosevelt's Porcupine Bay Campground and boat launch. The campground and boat launch are closed until repairs can be completed (Landers 2017). It is unknown how long the repairs will take; however, it is anticipated that the repairs will be completed prior to the start of the Cayuse Cove stabilization project.

3.3.2 Environmental Consequences

Proposed Action

The proposed action is expected to reduce sediment loading and turbidity and thus improve water quality conditions within Lake Roosevelt. The action is expected to minimize erosion from the toe of the terrace, but due to the size and low retention time of Lake Roosevelt, this reduction in suspended sediment would not be noticeable in the offshore areas of the reservoir.

Permitting for this project would be completed under the Joint Aquatic Resource Permit Application (JARPA). The JARPA process would identify and document all required mitigation to protect the water quality in Lake Roosevelt during the construction of the proposed action.

No Action

The No Action alternative would not alter the temperature and sediment conditions within Lake Roosevelt. The continued erosion of the shoreline would not significantly increase the sediment loading in the reservoir due to its size and low retention time.

Cumulative Effects

Implementing either the Proposed Action or No Action Alternative would not result in cumulative impacts to water resources. The operation of Grand Coulee Dam, especially the yearly raising and lowering of the water elevation in the Spokane Arm, will continue to impact the river banks and increase erosion and sediment loading into the Spokane Arm. The potential short-term impacts to water quality during construction activities would cease upon completion of the project. The implementation of the proposed action would have positive future impacts to the Spokane Arm while maintaining the integrity of the cultural resources in the vicinity and protect shoreline from future erosion and sediment loading.

3.4 Vegetation

3.4.1 Affected Environment

The landscape and vegetation regimes surrounding Lake Roosevelt vary across the area, from mixed conifer and ponderosa pine forests in the northern and eastern portions, to semi-arid vegetation classes along the western portions of the reservoir. Additionally, grasslands, pastures, and occasional wetlands add to the wide range of plant diversity.

Vegetation in the project area consists of a combination of severely burned conifers and shrubs, as well as a variety of herbs and grasses. Fluctuating water levels from reservoir operations, combined with erosion from wave action, a south-facing aspect of the shoreline, and the climate regime, limit the population of near-shore vegetation.

In 2016, the Hart Fire burned approximately 1 acre of the Cayuse Cove project area (Figure 8). The Hart Fire Post-Fire Response Plan work was initiated in spring 2017; the detection

surveys were completed along all roads and ORV trails, archaeological surveys were conducted prior to planting (occurring in summer 2017), and hazardous tree assessments were conducted. The post-fire response plan will continue until summer 2019 to stabilize and rehabilitate the area burned by the Hart Fire in the Lake Roosevelt National Recreation Area. A site visit on April 12, 2017, showed that a new understory consisting of grasses and forbs has sprouted following the fire. There is a high likelihood for noxious and/or invasive plant species to invade or expand into the burned areas.

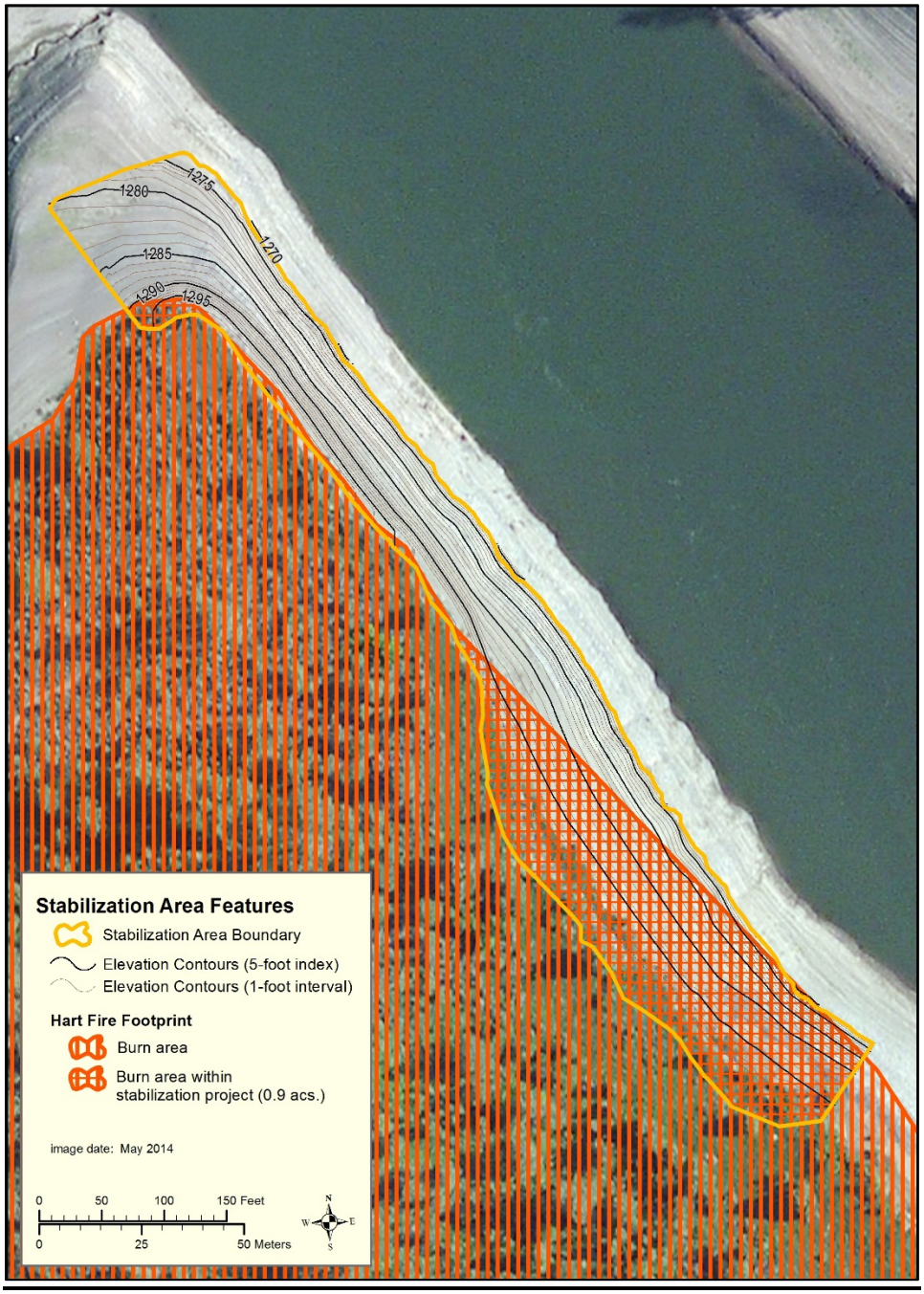

Figure 8. Cayuse Cove bank stabilization project area burned by the 2016 Hart Fire

3.4.2 Environmental Consequences

Proposed Action

There would be minor, short-term, localized disturbance and compaction of vegetation immediately adjacent to the site as the stabilization structure is installed. Disturbed and stabilized areas would be seeded or planted with native species to help stabilize soils and improve the appearance of the completed project. The installation of Geoweb would reduce shoreline erosion from natural and human-made wave action. Decreased erosion offers the potential for some plant communities to establish or increase populations in the area. Approximately 1 acre of new vegetation would be established, resulting in an increase in total area of vegetation over existing conditions. In addition, this would help control invasive species that may be encroaching since the Hart Fire.

No Action

Over the long term, as soil is lost from the site, the ability of the site to support vegetation would diminish. Given the small size of the affected area, the impacts to vegetation would be relatively small; however, there is a high likelihood of encroachment of invasive species since the Hart Fire.

Cumulative Effects

Vegetation along the Cayuse Cove bank stabilization project area has been impacted by dam construction, subsequent water impoundment, and altered water flows, as well as wildfire and recreation. The majority of the vegetation in the project area was burned in the 2016 Hart Fire. The Hart Fire Post-Fire Response Plan was completed in 2016 and includes herbicide and manual control of a range of invasive species, especially knapweeds, rush skeletonweed, cheatgrass, yellow star thistle, toadflax, and Scotch thistle on NPS land within the boundaries of the Hart Fire. In addition, trail rehabilitation will also be completed in order to keep OHVs from spreading invasive species. Impacts due to dam operation, altered water flows, recreation, and non-native plant species are presently occurring and likely will continue to occur in the future. The proposed action would be unlikely to contribute to cumulative effects on vegetation within the analysis area due to the small level of disturbance. The project would be beneficial to the analysis area because it would treat a source of sediment and proposes to re-establish native riparian vegetation.

3.5 Noise

3.5.1 Affected Environment

Noise is defined as unwanted sound that is objectionable because it is disturbing or annoying due to its pitch or loudness. Pitch is the height or depth of a tone or sound. Higher-pitched signals sound louder to humans than sounds with a lower pitch. Loudness is the intensity of sound waves combined with the reception characteristics of the ear.

A decibel (dB) is a unit of measurement that is used to indicate the relative amplitude of a sound. Sound levels in dB are calculated on a logarithmic scale. Subjectively, each 10 dB increase in sound level is generally perceived as approximately a doubling of loudness.

Excavating equipment would be required to remove sand and cobbles for anchoring the Geoweb, as well as for placing gabion baskets along the bank for stabilization. The excavation would occur from the barge and not on land. Excavation would also be required to take place when the reservoir is at its lowest elevation. The primary environmental effect of excavation is airborne noise.

Noise sources in the area of potential affect are predominantly boat recreation and natural. Accordingly, existing ambient noise levels are low. Motorboat recreation noise levels typically range from 85 to 115 dBA. Background noise levels in wilderness and rural areas typically range between 35 and 45 dBA. The closest private residence to the project is located approximately 0.3-mile southeast of the construction zone.

3.5.2 Environmental Consequences

Proposed Action

During construction, there would be some noise and visual disturbance from heavy equipment. Such disturbance is not expected to be significant due to the short duration. Construction activities producing high-intensity impact noise would be performed only weekdays during the hours of 7:00 a.m. to 7:00 p.m. In addition, 80 decibels (daytime) would not be exceeded, as measured at noise-sensitive areas such as residences, during the hours of 7:00 a.m. to 7:00 p.m.

No Action

Under the No Action alternative, no construction would occur at this location. Existing noise with its various components would remain at their current levels.

Cumulative Effects

No cumulative effects are anticipated on this resource as a result of the proposed project.

3.6 Wildlife

3.6.1 Affected Environment

The 2016 Hart Fire severely burned the majority of the vegetation community of native shrubs, grasses, and forbs, as well as the surrounding mixed conifers in the project area. These communities typically provide abundant and diverse habitats for wildlife species. Due to the severity of the burn, there is limited habitat available for nesting or foraging. In addition, for an approximately 3-month period, the lake drawdown separates the riparian habitats from the reservoir by an expanse of barren land. As a result of the reservoir fluctuation, erosion has caused banks to slough and has led to an overall loss of vegetation on the banks.

3.6.2 Environmental Consequences

Proposed Action

Due to the severe burn from the 2016 Hart Fire and lack of habitat, no migratory birds are expected to nest or forage in the stabilization site during construction. Long-term protection of the shoreline from soil erosion would allow vegetation communities to potentially thrive and grow, producing increased wildlife habitat for nesting and foraging. The proposed action would re-establish habitat that was lost during the Hart Fire and to erosion, allowing for wildlife to use the area and benefit from the proposed action.

No Action

Over the long term, as soil and vegetation are lost from the site due to erosion and sloughing of the bank, the ability of the site to provide wildlife habitat would diminish. Given the small size of the affected area, the impacts to wildlife habitat and species would be small.

Cumulative Effects

Implementing the Proposed Action or No Action Alternative would not result in cumulative impacts to wildlife. With the proposed action, there would be an increase in overall habitat over existing conditions that would allow additional species to occupy the area, resulting in a positive impact for the future.

3.7 Fisheries

3.7.1 Affected Environment

Currently, the lower Spokane Arm fish assemblage consists primarily of non-native warm-water species such as largemouth bass, yellow perch, tench, and brown trout. Historic stocks of native species that continue to inhabit the Spokane Arm below Spokane Falls include largescale sucker, redside shiner, northern pikeminnow, and chiselmouth. White sturgeon are present in the Spokane Arm subbasin, based on the collection of one individual (according to Scholz, as cited in Whalen 2000).

Though historically common throughout the subbasin, the native salmonid assemblage is now restricted to severely depressed populations of three species of salmonids, including kokanee, redband trout, and westslope cutthroat trout. Westslope cutthroat trout are believed to be fairly abundant in the Spokane Arm upstream of Post Falls in Idaho (according to Corsi, as cited in Whalen 2000).

Although bull trout are considered native in the subbasin, current observations are limited to anecdotal data, which are believed to be migrants from tributaries in the upper basin, such as Lake Coeur d'Alene.

3.7.2 Environmental Consequences

Proposed Action

The operation of Grand Coulee Dam, especially the yearly raising and lowering of the water elevation in the Spokane Arm, will continue to impact the riverbanks and increase erosion. No construction activities would occur directly in the water. However, potential short-term impacts to fisheries could include temporary displacement from presence of the barge in the water during construction. Fish that may occupy the area would likely leave the area surrounding the barge during construction activities. These activities and potential short-term impacts would cease upon completion of the project. Due to the slope and sediment type, suitable spawning habitat for fish is lacking and would not be impacted.

No Action

The absence of bank stabilization would likely result in continued erosion of the bank. Increased erosion could worsen, as would downstream water quality from increased suspended solids. Increased sediment could have some negative biological impacts. Minimal sedimentation might affect aquatic and semi-aquatic species that would be available to fish as a food source. No new vegetation would be planted, and shade habitat and riverine habitat would be dependent upon natural recolonization and present water flow conditions, respectively.

Cumulative Effects

Grand Coulee Dam does not have a fish passage structure for all fish to move freely within the system. It is well documented that dam construction has eliminated or reduced fish passage through these facilities (FAO 2001). Development and recreational activities, especially boating, are prevalent in and adjacent to the Spokane Arm. All of these activities are expected to continue in the future. In the analysis area, recreation and development will likely increase in the future, which will likely increase erosion and sediment movement into the river. The operation of Grand Coulee Dam, especially the yearly raising and lowering of the water elevation in the Spokane Arm, will continue to impact the riverbanks and increase erosion.

The use of BMPs during implementation of the project would limit sediment input to the Spokane Arm. Since the project would reduce soil erosion and sediment loading into the Spokane Arm, long-term beneficial effects to aquatic species are anticipated.

3.8 Threatened and Endangered Species

3.8.1 Affected Environment

The following list of species and candidate species protected by the Endangered Species Act (ESA) was developed by accessing listed species for Lincoln County, Washington, at https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=53043.

Listed Species

Bull trout *(Salvelinus confluentus)*

Yellow-billed cuckoo *(Coccyzus americanus)*

Candidate

North American wolverine *(Gulo gulo luteus)* – contiguous U.S. distinct population segment (DPS)

Yellow-billed Cuckoo

Life History and Ecology

Yellow-billed cuckoos (*Coccyzus americanus*) are medium-sized birds that average about 12 inches long and weigh approximately 2 ounces. Unlike some species of cuckoo, the yellow-billed is not a brood parasite (laying eggs in other bird's nests), but rather typically builds its own nest and raises its own young. The yellow-billed cuckoo prefers floodplain forests with thick deciduous vegetation. They fly south of the Amazon River basin in September to wintering habitat and return to North America in mid-May. Large insects, including caterpillars and cicadas, make up the bulk of the bird's diet, although cuckoos will occasionally eat small frogs and lizards. Breeding corresponds with the occurrence of tent caterpillars and cicadas.

Status and Distribution

On October 3, 2014, the USFWS issued a final rule, under the Endangered Species Act of 1973, listing the western DPS of the yellow-billed cuckoo as a threatened species (USFWS 2014a).

The yellow-billed cuckoo has historically bred throughout much of North America; however, available data suggest that there have been significant declines in the species distribution west of the Rocky Mountains due to streamside habitat loss (USFWS 2014a). The yellow-billed cuckoo (western DPS) is known to, or believed to, occur in all Washington State counties (USFWS 2015). However, there is no suitable habitat adjacent to the project and staging areas.

Reasons for Decline

The loss of riparian habitat is reportedly the greatest threat to the species. Biologists have estimated that riparian habitat degradation due to agriculture, streamflow management, overgrazing, and exotic plant competition has reduced the yellow-billed cuckoo's riparian habitat by 90 percent in the West (USFWS 2014a).

Designated Critical Habitat

On August 15, 2014, the USFWS proposed a rule to designate critical habitat for the western DPS of the yellow-billed cuckoo. The agency has proposed 546,335 acres in Arizona, California, New Mexico, Colorado, Idaho, Nevada, Texas, Utah, and Wyoming as critical

habitat. The project area and staging area are not located within the designated critical habitat (USFWS 2014b).

Bull Trout

Life History and Ecology

Bull trout (*Salvelinus confluentus*) are cold-water fish that live in pristine stream and lake habitats. They have specific habitat requirements, including cold water temperatures, clean stream substrates for spawning and rearing, and complex habitats with riffles, deep pools, undercut banks, and large woody debris, as well as connectivity between headwater spawning habitats and mainstem river or lake overwintering habitats (USFWS 2011). Bull trout express both resident and migratory life history forms, with migratory fish spawning in cold, high-mountain tributaries in the fall, and overwintering in mainstem river habitats and lakes. Juvenile migratory fish typically rear in tributaries for 2 years, and then out-migrate to lakes and mainstem rivers. Residents stay in spawning tributaries for their entire life cycle. Adults eat primarily fish, and juveniles feeding on aquatic invertebrates (NatureServe 2011).

Status and Distribution

The USFWS issued a final rule listing the Columbia River and Klamath River populations of bull trout as threatened species under the ESA on June 10, 1998 (USFWS 1998). The most recent status review reaffirmed the listing (USFWS 2010).

Bull trout are known to use the mainstem Columbia River for feeding, migration, and overwintering habitat (USFWS 2008). Bull trout are rare in Lake Roosevelt and its tributaries, but a few have been documented (Spokane Tribe of Indians 2000; Lake Roosevelt Forum 2011).

Reasons for Decline

Habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, and past fisheries management practices, such as the introduction of non-native species, threaten the Columbia River DPS (USFWS 1998).

Designated Critical Habitat

The mainstem Columbia River downstream of Chief Joseph Dam is included in critical habitat that was designated for bull trout on October 18, 2010 (USFWS 2010). Designated critical habitat did not include Lake Roosevelt, the Columbia River below Grand Coulee Dam to Chief Joseph Dam, or tributaries entering these water bodies.

3.8.2 Environmental Consequences

Proposed Action

Under the Proposed Action, Reclamation would install Geoweb bank stabilization. Reclamation examined the effects this alternative would have on hydrology and water quality, as well as water and terrestrial habitat, to determine the potential to affect listed species in the area.

Yellow-billed Cuckoo

There would be no effect to the yellow-billed cuckoo or its habitat, as suitable habitat for this species is not present in or adjacent to the project area.

Bull Trout

Bull trout are rare in Lake Roosevelt and more uncommon, if found at all, in nearby tributaries such as the Spokane Arm. Based on the results of the hydrology and water quality analyses, the proposed action would not affect bull trout habitat or the species.

No Action

Under the No Action alternative, Reclamation would not install any shoreline protection systems. Water quality, hydrology, and shoreline vegetation would remain the same as current conditions, and habitat for listed species would not change.

Cumulative Effects

Implementing the Proposed Action or No Action Alternative would not result in cumulative impacts to threatened and endangered species.

3.9 Transportation

3.9.1 Affected Environment

Porcupine Bay Road is the main road for accessing the Porcupine Bay Campground and boat launch, as well as private residences. The Spokane Arm is a popular recreation area for boaters. Peak season for recreation is June through August (see Figure 7). The project area site is not accessible by overland travel, and therefore, barging would be the primary method for transporting materials to the project site.

3.9.2 Environmental Consequences

Proposed Action

Trucks hauling material for this project would use state highways and county roads as necessary to travel to transport materials to the staging area. Although there may be brief interruptions in traffic when entering or leaving the staging area, no changes in local road traffic or transportation patterns are expected to occur as a result of the proposed shoreline stabilization project. In addition, there would be minor impacts to recreational boaters due to the presence of a barge transporting materials to the project site.

No Action

With the No Action alternative, no changes are expected in local road traffic or transportation patterns.

3.10 Cultural Resources

3.10.1 Affected Environment

Background

The most common cultural resources at Lake Roosevelt can be grouped into three categories: Archaeological Sites, Traditional Cultural Properties (TCPs), and Buildings and Structures. Archaeological sites are the remaining evidence of past use of a particular location. TCPs are specifically defined as places associated "with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1998). Historic Buildings and Structures are extant features that are at least 50 years old. The primary focus of this Cultural Resources section is archaeological site 45LI377, which the proposed action is designed to protect.

Past work to identify and evaluate cultural resources for the National Historic Preservation Act (NHPA) in the project area of potential effect (APE) has included literature review, pedestrian inventory, and site monitoring. Other work conducted by and for Reclamation and the other cooperating agencies of the Lake Roosevelt Spokane Arm CG in the project vicinity include the completion of an NPS 10-900 Determination of Eligibility Form for the Cayuse Cove archaeological site (45LI377) and several testing and emergency data recovery projects at various locations around the Cayuse Cove area. NPS handles Section 106 compliance for its recreation facilities, including at Porcupine Bay Campground. NPS has conducted several inventory and testing projects at the proposed staging area.

TCP inventory occurs on the Spokane Arm similarly to archaeological and historical inventories, with ongoing inventories performed by the Spokane Tribe Preservation Program under contract to the lead Federal agencies to meet the requirements of the SWPA.

Archaeological Resources within the Project Area

The lower stretch of the Spokane Arm of Lake Roosevelt from Little Falls Dam to the confluence with the Columbia River contains dozens of archaeological sites on NPS-managed lands on the south shore and on Spokane Tribe-managed Federal lands on the north shore of the reservoir on the Spokane Reservation. The banks of the former Spokane River channel and the associated cultural resources have been subject to accelerated erosion and related disturbance and loss since completion of Grand Coulee Dam in 1942. Archaeological sites along the Spokane Arm of Lake Roosevelt include habitations, resource gathering and processing sites, rock images, and other types of human use areas. The sites date from about the end of the Pleistocene to modern times and indicate a long-term and continuous human use of the Spokane and Columbia Rivers by the Spokane Tribe and their ancestors.

The APE for this assessment includes the area to be stabilized at Cayuse Cove and the staging and barge loading and launching area at Porcupine Bay Campground (Figure 2).

Cayuse Cove (Stabilization Site)

Cayuse Cove area was first surveyed for archaeological sites in 1966, but it was not until 1999 that the Spokane Tribe Preservation Program conducted the first intensive survey of Cayuse Cove and recorded archaeological site 45LI377 (Jones 2008). Background research, combined with the archaeological work conducted since 2000, indicates that Cayuse Cove may be one of three ethnographic sites identified by John A. Ross as an important fishing and/or freshwater mussel collecting site (Ross 1991-1993). The site soils have produced a diversity of information about past lifeways as demonstrated through artifacts and intact features (Arneson 2000, 2005a, and 2005b; Casserino 2014a; Harrison 2013; Harrison and Casserino 2015; Jones 2008 and 2010; Spokane Tribe of Indians 2006). The archaeological information collected from the site indicates it was used sporadically between 4,160 years before present (b.p.) and as late as 1,420 years b.p. (Harrison 2015). Based on the archaeological evidence, the Cayuse Cove Site (45LI377) was determined to be eligible for listing on the National Register of Historic Places by the cooperating agencies (Casserino 2014b).

Cayuse Cove is reportedly the most rapidly eroding archaeological site on the Spokane Arm (Harrison and Casserino 2015), and the erosion has exposed large volumes of archaeological deposits. Of known sites on the Spokane Arm, this site has been identified as the most in danger of imminent destruction from erosion (Harrison and Casserino 2015). Grand Coulee Dam operations are the biggest impact to the integrity of the site. Waves, current, and reservoir pool fluctuations (from annual drawdown and refill) are the primary causes of this erosion (Harrison and Casserino 2015). The cut bank is subject to rapid erosion and slumping at high water, and bank calving during reservoir drawdowns for flood control and dam maintenance (Spokane Tribe of Indians 2006; Jones 2008, 2010; Harrison and Casserino 2015). Relic collecting/vandalism/looting and recreational ATV use on the beach have been a concern in past years, as well. Wake from ski boats is a growing concern as it batters the cut bank during the summer months.

Porcupine Bay Campground (Staging Area)

Numerous cultural surveys and tests have been conducted in the Porcupine Bay area over the past 30 years (DePuydt 2012). James McKie and David Chance (1980) first surveyed the Porcupine Bay Campground in 1979, recording archaeological site 45LI0049; the site was not considered eligible for inclusion in the National Register of Historic Places. The site boundary was extended following survey by Ray DePuydt (1999); no evidence of intact subsurface cultural deposits was found. The most extensive survey above the high water line in the Porcupine Bay area was conducted by Ray DePuydt in 2001 in the forested area between the campground and launch ramp; no evidence of buried cultural resources was found. No other cultural resources or sites were recorded during archaeological surveys conducted in the Porcupine Bay area between 1980 and 2012 (DePuydt 2000, 2006, and 2012; Harry 1992; Hartzell-Scott 1994, b, c; Riser 2011).

Traditional Cultural Properties

There are a number of TCPs along the Spokane Arm of Lake Roosevelt. Due to the sensitivity of TCPs to the Spokane Tribe, details of location and use of TCPs along the Spokane Arm are not disclosed. The Spokane Tribe have not identified any concern related to potential TCPs in the project area, and no TCPs were identified at the proposed construction and staging sites.

Buildings and Structures

There are no historic buildings or standing structures in the APE for the Cayuse Cove stabilization project.

3.10.2 Environmental Consequences

Proposed Action

Archaeological

Cayuse Cove

Installation of Geoweb and gabion basket structures along the eroding shoreline would provide immediate and long-term protection of the Cayuse Cove archaeological site from erosion. Protection and avoidance of impacts to cultural resources were considered in design of this Section 106 project. Cultural resource impacts would be avoided and best management practices implemented, including completion of Section106 consultation, continuation of Native American consultation, and continued development of the avoidance strategy in the stabilization design and contract specifications for the Proposed Action.

There is low potential for disturbance of cultural resources associated with the Proposed Action. Monitoring and archaeological testing conducted by the Spokane Tribe Preservation Program indicate that the intact site exists behind the cut bank, but that areas where the stabilization structure would be excavated into the slope (shoreline) would not impact in situ archaeological remains (Casserino 2016, Harrison and Casserino 2015). Project engineers and archaeologists worked closely with the Spokane Tribe Preservation Program and THPO to design the project in a manner that would minimize disturbance to the existing shoreline and resources. The shoreline protection system would be placed on fill brought into the site, and excavation would be limited to targeted locations that were determined by recent archaeological testing so as to not adversely affect in situ archaeological resources.

Barge-based construction would limit the types of disturbances normally caused by tracked vehicles during land based construction. The use of fill and geotextile fabric as the base of the stabilization structure would provide a layer of protection for the natural ground surface below the Geoweb and gabion basket walls. Native plantings and additional fill over the gabion walls and Geoweb surfaces would help protect the structure from continued erosion from Lake Roosevelt and shield the site from increased interest from looters, boaters, and recreationalists. At most, minor direct or indirect impacts would be anticipated to the already disturbed areas of the archaeological site during construction. The construction of the

stabilization structure would have No Adverse Effect on Identified Historic Properties (36 CFR 800.5 [d] [1]), as defined by the NHPA.

Porcupine Bay Campground

At Porcupine Bay Campground, the staging and barging operations would be regulated by a Special Use Permit through NPS. There would be no new ground disturbance as a result of the staging and barge loading and landing operations; all work would be confined to previously disturbed areas covered with asphalt or gravel. No impacts to the previously recorded archaeological site at the campground would be expected as a result.

TCPs

The Proposed Action would have no effect on TCPs. The Spokane Tribe have not identified any TCPs that would be adversely affected by stabilization of the eroding Cayuse Cove cut bank, and no TCPs have been identified in the APE.

Buildings and Structures

The Proposed Action would not affect historical buildings and structures, as no buildings or structures of historic significance were identified in the APE.

No Action Alternative

Archaeological

Cayuse Cove

Under the No Action Alternative, a stabilization structure would not be installed at the project site. In the absence of a protective structure, the shoreline would continue to erode and the determined eligible archaeological site would continue to be irreparably damaged by natural and anthropogenic causes and potentially completely lost.

Some (but not all) disturbance and loss to the archaeological site could be mitigated through continued periodic monitoring or additional data recovery by professional archaeologists; however, data recovery in and of itself in cases such as this can be considered a substantial impact if the entire resource would be affected as a result.

Porcupine Bay Campground

The No Action alternative would not affect the archaeological site associated with Porcupine Bay Campground.

TCPs

The No Action alternative would have no effect on TCPs.

Buildings and Structures

The Proposed Action would not affect historical buildings and structures.

3.10.3 Cumulative Impacts

The proposed project is designed to, and would result in, protection and preservation of an archaeological site at Cayuse Cove. Many cultural sites along Lake Roosevelt have been degraded over time by operations of the lake and other natural and anthropogenic causes. There have been a few Section 106 projects implemented or planned along the shorelines of Lake Roosevelt to minimize some of these impacts. This project, when combined with other bank stabilization and Section 106 projects on the Spokane Arm, would incrementally provide cumulative protection to cultural resource sites along the shoreline of Lake Roosevelt.

If the Proposed Action or another method of stabilization were not constructed, the erosion of the site would continue and the integrity of the significant archaeological site at Cayuse Cove would be impacted until the site is irreplaceably destroyed. This would add cumulatively to the impacts and loss of other important cultural resource sites along Lake Roosevelt. The Spokane Tribe would lose another of their substantial cultural connections to the Spokane River, and the archaeological information contained in the site soils would be permanently lost, thus impacting efforts to interpret and understand past lifeways in the Columbia Plateau.

No TCPs or historical buildings or structures would be impacted under the Proposed Action or No Action Alternatives; therefore, there would be no cumulative impacts to these resources.

3.11 Indian Sacred Sites

Executive Order 13007, signed by President Clinton on May 24, 1996, defines a sacred site as:

> Any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site [E.O. 13007, Section 1 (b) (iii)].

3.11.1 Affected Environment

Cayuse Cove sits within the traditional territory of the Spokane Tribe. The Spokane Tribe have not informed Reclamation of any sacred sites within the immediate vicinity of the proposed project area. A number of locations with traditional Indian place names and traditional cultural value are present along the Mainstem and Spokane Arm of Lake Roosevelt, but the Spokane Tribe have not specifically identified Cayuse Cove, Porcupine Bay or the surrounding TCPs and archaeological sites as having established religious significance or ceremonial use.

3.11.2 Environmental Consequences

The Spokane Tribe have not informed Reclamation of any sacred sites in the vicinity of Cayuse Cove or Porcupine Bay Campground that would be impacted by the Proposed Action or No Action Alternative.

Based upon the review of existing information and consultations with the Spokane Tribe THPO and Spokane Tribe Preservation Program, implementation of the Proposed Action or No Action alternative would not result in direct or indirect impacts to sacred sites.

3.11.1 Cumulative Impacts

There would be no direct or indirect impacts to Indian Sacred sites from implementation of the alternatives. Therefore, there would be no cumulative impacts when considered with the other related actions.

3.12 Indian Trust Assets

3.12.1 Affected Environment

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Federally recognized Indian Tribes or individual Indians. ITAs may include land, minerals, Federally reserved hunting and fishing rights, Federally reserved water rights, and instream flows associated with trust land. The General Allotment Act of 1887 allotted land to some Tribes, while others were allotted land through treaty or specific legislation until 1934, when further allotments were prohibited. These allotments are considered ITAs.

As stated in the 1994 memorandum from President William J. Clinton, "Government-to-Government Relations with Native American Tribal Governments," Reclamation is responsible for the assessment of project effects on Tribal trust resources and Federally recognized Tribal Governments. Reclamation is tasked to actively engage and consult wth Federally recognized Tribal Governments on a government-to-government level when its actions affect ITAs.

The U.S. Department of the Interior Departmental Manual Part 512.2 delegates the responsibility for ensuring protection of ITAs to the heads of bureaus and offices (Department of the Interior 1995). The Department is required to, "protect and preserve ITAs from loss, damage, unlawful alienation, waste, and depletion" (Department of the Interior, 2000). Reclamation is responsible for determining if a proposed project has a potential to affect ITAs.

Federally recognized Indian Tribes with trust land are beneficiaries of the Indian trust relationship when the U.S. acts as trustee. No one can sell, lease, or otherwise encumber ITAs without approval of the U.S. Government. While the majority of ITAs are located on-reservation, ITAs can also occur outside reservation boundaries. Consequently, the Spokane Tribe of Indians have a historical presence and cultural interest in the larger project area.

3.12.2 Environmental Consequences

No ITAs have been identified in the project area, and the project would occur completely on land owned by Reclamation. Therefore, none of the alternatives would impact ITAs, since project impacts would be limited to Federal property.

3.13 Environmental Justice

3.13.1 Existing Environment

Executive Order 12898, dated February 11, 1994, requires Federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their actions on minorities and low-income populations and communities, as well as the equity of the distribution of the benefits and risks. Environmental justice addresses the fair treatment of people of all races and incomes with respect to actions affecting the environment. Fair treatment implies that no group should bear a disproportionate share of negative impacts.

The Cayuse Cove bank stabilization would occur in Lincoln County. Currently, the Cayuse Cove area offers minority and low-income populations fishing, hunting, camping, picnic areas, swimming, and other recreational opportunities. While the areas are available throughout the year, visitation to the area is greatest during the summer months.

Table 3 summarizes the racial characteristics of Lincoln County within the project area and compared to the state of Washington overall. Information contained in the 2010 to 2015 Census of Population was used to identify these populations. The 2010 to 2105 Census data for the white racial category comprise the greatest percentage for Lincoln County and the state of Washington (U.S. Census Bureau 2015).

Table 3. Racial population summary of the Lincoln County and the State of Washington

U.S. Census Bureau 2010 to 2015 Statistics	Lincoln County	State of Washington
Total Population, 2015 estimates	10,321	7,170,351
White alone (percent), 20 Project area at Cayuse Cove, Lake Roosevelt 15 (a)	94.2	80.3
Black or African American alone (percent), 2015 (a)	0.4	4.1
American Indian and Alaska Native alone (percent), 2015	1.9	1.9
Asian alone (percent), 2015 (a)	0.8	8.4
Native Hawaiian and other Pacific Islander alone (percent), 2015 (a)	0.1	0.7
Two or more races (percent), 2015	2.6	4.6
Hispanic or Latino (percent), 2015 (b)	3.1	12.4
White alone, not Hispanic or Latino (percent), 2015	91.5	69.8

(a) Includes persons reporting only one race
(b) Hispanics may be of any race, so also are included in applicable race categories
(c) Economic Census – Puerto Rico data are not comparable to U.S. Economic Census data

Low-income populations are identified by several socioeconomic characteristics. Specific characteristics used in this description of the existing environment, as categorized by the 2011 to 2015 Census, are income (per capita income and median household income) and percentage of the population below poverty. Table 4 provides income and poverty information for the State of Washington and Lincoln County.

Table 4. Income and poverty – State of Washington, and Lincoln County

Geographic Area	Per Capital Income	Median Household Income	People Below Poverty
Washington State	$31,762	$61,062	12.2%
Lincoln County	$24,951	$46,069	14.0%

*Information taken from U.S. Census Bureau: State and County Quick Facts for years 2011-2015 (U.S. Census 2015)

3.13.2 Environmental Consequences

Proposed Action

The Proposed Action would not involve major facility construction, population relocation, health hazards, hazardous waste, property takings, impacts to community facilities/resources or substantial economic impacts. This action would therefore have no adverse human health or environmental effects on minority and low-income population.

No Action

Under the No Action alternative, there would be no direct or indirect effects on minority and low-income populations. The reservoir would be operated as it has in the past. There would be no environmental justice effects to the area due to the small size of the project. The existing environmental conditions would remain intact and would not be affected.

Cumulative Effects

No cumulative effects are anticipated on this resource as a result of the proposed project.

4 Consultation and Coordination

4.1 National Historic Preservation Act

The National Historic Preservation Act was enacted in 1966 and requires Federal agencies to consider project-related impacts to historic properties, which includes prehistoric and historic-period archeological sites, traditional cultural properties, and elements of the built environment. The process for implementing the NHPA is defined in Federal regulations (30 CFR 800) and includes consultation with the SHPO, THPO, and Advisory Council on Historic Preservation about Federal findings regarding project effects. This work at Lake Roosevelt, for the operations and maintenance of Grand Coulee Dam, is covered by the FCRPS SWPA. The Proposed Action's primary purpose is to satisfy the requirements of the SWPA and mitigate adverse effects to a National Register-eligible archaeological site.

4.2 Endangered Species Act (1973) Section 7 Consultation

The Endangered Species Act (ESA) requires all Federal agencies ensure that their actions do not jeopardize the continued existence of listed species, or destroy or adversely modify their critical habitat. As part of the ESA's Section 7 process, an agency must request information from the USFWS and NOAA Fisheries on whether any threatened and endangered species occur within or near the action area. The agency then must evaluate impacts to those species. If the action may affect any listed species, the agency must consult with the USFWS or NOAA Fisheries to ensure that the project will not jeopardize listed species or destroy or adversely modify their critical habitat. Reclamation requested a species list from USFWS on February 7, 2017. Review of the list received from USFWS indicated that the project would have no effect on listed species or their critical habitat.

4.3 Tribal Coordination and Consultation

Reclamation is proposing to install a stabilization structure at the request of the Spokane Tribe to protect archaeological resources along the Cayuse Cove shoreline from additional erosion. The project is a Section 106 mitigation/treatment designed to meet the stipulations of the FCRPS SWPA. Reclamation and BPA have partnered with the Spokane Tribe and the rest of the Lake Roosevelt Spokane Arm CG during the planning and design of the project and during the preparation of this EA. As a result, project planning and design includes the input of the Spokane Tribe THPO, Spokane Tribe Department of Natural Resources, and Spokane Tribe Preservation Program; the NPS; and SHPO.

The SHPO and THPO have been consulted throughout the planning process and are involved in review of the design and environmental compliance. Staff-level communications were conducted throughout the planning process. Formal Section 106 consultation would be conducted primarily through an FCRPS treatment form. The form would be signed by the Lead Agencies, and would include the SHPO and THPO determination that there would be

no adverse effect to significant historic resources caused by this undertaking and that the action resolves the adverse effects of recreation and drawdown related erosion caused by the operations at Grand Coulee Dam.

Reclamation would conduct ongoing consultation with the SHPO, Spokane Tribe Preservation Program, and Spokane Tribe THPO regarding changing project conditions and any potential for those changes to affect historic properties. As construction plans and potential impacts change, new findings and plans would be developed to minimize any adverse effect on historic properties and cultural objects. The Spokane Tribe Business Council will be specifically invited to comment on this EA during the NEPA process.

Prior to construction, Reclamation would notify the Spokane Tribe Preservation Program of the intent to proceed and deliver to them the project schedule and the opportunity to provide an archaeological monitor to inspect the construction effort. If project work encounters archaeological materials during construction, all ground-disturbing activities in the area of the archeological resource would be stopped. Construction would not resume until any mitigation measures developed in consultation between Reclamation and the THPO have been completed. The construction contractor would be made aware of the potential presence of archeological materials and directed to avoid areas that may contain exposed archaeological materials, per the design and specifications.

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