



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Washington Ecological Services  
1009 College St. SE, Suite 215  
Lacey, Washington 98503



In Reply Refer to:  
**FWS/R1/2023-0100131**

March 1, 2024

Todd Tillinger, Regulatory Branch  
U.S. Army Corps of Engineers, Seattle District  
Attn: K. Mahen  
4735 East Marginal Way South, Building 1202  
Seattle, Washington 98134-2388

Dear Mr. Tillinger:

Subject: Lake Cushman and Lake Kokanee Programmatic Opinion

This letter transmits the U.S. Fish and Wildlife Service's (USFWS) Biological Opinion (Opinion) addressing the proposed Lake Cushman and Lake Kokanee Programmatic, located in Mason County, Washington, and its effects on designated bull trout (*Salvelinus confluentus*) critical habitat. Formal consultation was conducted in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA). Your June 15, 2023, request for formal consultation was received on June 15, 2023.

The enclosed Opinion is based on information provided in the June 9, 2023, Biological Assessment (BA) and supporting information, telephone conversations, field investigations, and other sources of information cited in the Opinion. Additional information was requested on October 26, 2023, and was received on November 7, 2023. A complete record of this consultation is on file at the USFWS's Washington Fish and Wildlife Office in Lacey, Washington. An electronic copy of this Opinion will be available to the public approximately 14 days after it is finalized and signed. A list of Opinions completed by the USFWS since October 1, 2017 can be found on the Environmental Conservation Online System (ECOS) website at <https://ecos.fws.gov/ecp/report/biological-opinion.html>.

The BA also included a request for USFWS concurrence with "may affect, not likely to adversely affect" determinations for bull trout, marbled murrelet (*Brachyramphus marmoratus*), and northern spotted owl (*Strix occidentalis caurina*). The enclosed document includes a section separate from the Opinion that addresses your concurrence request(s).

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### PACIFIC REGION 1

IDAHO, OREGON\*, WASHINGTON,  
AMERICAN SAMOA, GUAM, HAWAII, NORTHERN MARIANA ISLANDS

\*PARTIAL

If you have any questions regarding the enclosed Opinion, our response to your concurrence request(s), or our shared responsibilities under the ESA, please contact Ryan McReynolds (ryan\_mcreynoldsfws.gov) or Assistant Field Supervisor Curtis Tanner (curtis\_tanner@fws.gov).

Sincerely,

*for* Brad Thompson, State Supervisor  
Washington Fish and Wildlife Office

Enclosure(s)

cc:

Corps, Seattle, WA (A. Shuckhart)  
Tacoma Power, Tacoma, WA (T. Nelson)  
NOAA-NMFS, Lacey, WA (J. Vanderpham)  
NOAA-NMFS, Lacey, WA (B. Shorin)  
Skokomish Indian Tribe, Skokomish, WA (J. Pavel)

# Endangered Species Act - Section 7 Consultation

## BIOLOGICAL OPINION

U.S. Fish and Wildlife Service Reference:  
2023-0100131

Lake Cushman and Lake Kokanee Programmatic

Mason County, Washington

Federal Action Agency:

U.S. Army Corps of Engineers

Consultation Conducted By:

U.S. Fish and Wildlife Service  
Washington Fish and Wildlife Office  
Lacey, Washington

*for*

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Brad Thompson, State Supervisor  
Washington Fish and Wildlife Office

March 1, 2024

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Date

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## ACRONYMS AND ABBREVIATIONS

BA	Biological Assessment
CCM	Construction Conservation Measure
CFR	Code of Federal Regulations
cfs	cubic feet per second
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
dbh	diameter-at-breast-height
ESA	Endangered Species Act of 1973, as amended (16 U.S.C. 1531 <i>et seq.</i> )
FERC	Federal Energy Regulatory Commission
FMO	Foraging, Migrating, and Overwintering
FR	Federal Register
ft <sup>2</sup>	square feet
HPA	Hydraulic Project Approval
IPCC	Intergovernmental Panel on Climate Change
km <sup>2</sup>	square kilometers
mi <sup>2</sup>	square mile
NMFS	National Marine Fisheries Service
OHWM	Ordinary High-Water Mark
Opinion	Biological Opinion
PCE	Primary Constituent Element
RPM	Reasonable and Prudent Measures
RU	Recovery Unit
SEL	Sound Exposure Level
USFWS	U.S. Fish and Wildlife Service
WDOE	Washington State Department of Ecology

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## 1 INTRODUCTION

This document represents the U.S. Fish and Wildlife Service's (USFWS) Biological Opinion (Opinion) and concurrence, based on our review of the U.S. Army Corps of Engineers' (Corps) proposed Lake Cushman and Lake Kokanee Programmatic, located in Mason County, Washington. The Opinion addresses foreseeable effects to designated bull trout (*Salvelinus confluentus*) critical habitat in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA). The Corps' June 15, 2023, request for formal consultation was received on June 15, 2023.

The enclosed Opinion is based on information provided in the June 9, 2023, Biological Assessment (BA) and supporting information, telephone conversations, field investigations, and other sources of information cited in the Opinion. Additional information was requested on October 26, 2023, and was received on November 7, 2023. A complete record of this consultation is on file at the USFWS's Washington Fish and Wildlife Office in Lacey, Washington.

The Corps made "no effect" determinations for additional listed species and designated critical habitat that are known to occur in Mason County. These "no effect" determinations rest with the action agency. The USFWS has no regulatory or statutory authority for concurring with "no effect" determinations, and no consultation with the USFWS is required. We recommend that the Corps document their analyses on effects to listed species and maintain that documentation as part of their project file.

On July 5, 2022, the U.S. District Court of the Northern District Court of California (the Court) vacated the 2019 regulations implementing section 7 of the ESA. As a result of the Court's vacatur order, the 2019 regulations are no longer in effect, and the USFWS has relied upon the pre-2019 regulations in rendering this Opinion. However, because the Court's vacatur could be stayed pending appeal, or ultimately overturned on appeal, we considered whether our substantive analyses and conclusions would be different if the 2019 regulations were applied. Our analyses include the prior definition of "effects of the action," among other prior terms and provisions. We consider all consequences of the proposed action, that would not occur but for the action, and that are reasonably certain to occur, when determining the "effects of the action". As a result, we find that the analyses and conclusions reached and described here would be the same, irrespective of which regulations apply.

## 2 CONSULTATION HISTORY

The following is a summary of important events associated with this consultation:

- The USFWS met routinely with the Corps, National Marine Fisheries Service (NOAA), Tacoma Power, and the Skokomish Indian Tribe, between October 2021 and June 2023, to coordinate and plan for the program of ESA coverage (and documentation) for specific shoreline activities on Lakes Cushman and Kokanee.
- A site visit was conducted on October 21, 2022, as a part of pre-consultation discussions.

- The BA and request for formal consultation were received on June 15, 2023. Consultation was initiated on June 15, 2023.
- Additional information was requested on October 26, 2023, and was received on November 7, 2023.
- A copy of the draft Programmatic Opinion was provided to the Corps and Tacoma Power for review and comment on December 20, 2023.
- Comments for the draft Programmatic Opinion were provided by the Corps on January 11, 2024.

### 3 CONCURRENCE

The proposed federal action includes implementation of a program of ESA coverage for specific shoreline activities (Covered Activities), that are proposed within or accompanying a Corps Clean Water Act (CWA) permit application, on Lake Cushman and/or Lake Kokanee. Lake Cushman and Lake Kokanee are flow-regulated reservoirs, located on the North Fork (NF) Skokomish River above the Cushman Dam Numbers 1 and 2. The complete project description appearing in the body of the Opinion is incorporated here by reference.

Covered activities will include specific avoidance and minimization measures, including design guidelines, design criteria, required procedures, and specifications, to reduce impacts to shoreline and nearshore habitat functions, for the conservation of ESA-listed species and designated critical habitat(s) (see Description of the Proposed Action, from the Opinion). Additional specific shoreline activities are excluded from programmatic ESA coverage, including new single-family docks, new single-family piers, and new structural shoreline stabilization measures.

All construction in Lake Cushman must be completed in the dry, when the reservoir is drawn down (i.e., below the full pool elevation of 738 ft) and the work area is above the water surface elevation. Work below the ordinary high-water mark (OHWM) must be completed when the full pool elevation is a minimum of 5 ft waterward of proposed activities (i.e., 5 ft of dry land between water and work area). Activities proposed below the OHWM of Lake Kokanee must occur between July 1 and October 1, or when the lake is drawn down below the work area, or as determined by the Washington Department of Fish and Wildlife (WDFW) during Hydraulic Project Approval (HPA) review.

The Corps will review CWA permit applications on Lakes Cushman and Kokanee, to confirm and/or seek adjustments and confirm, that all relevant conservation measures are met (inclusive of design guidelines, design criteria, required procedures, and specifications). Interdependent shoreline activities and work will be considered and permitted by the Corps together, and Corps applicants may not separate, and will not pursue separate ESA consultation requests, for interdependent shoreline activities and work. Figure 1 depicts Lake Cushman and Lake Kokanee, shoreline designations, the surrounding landscape, and the action area.



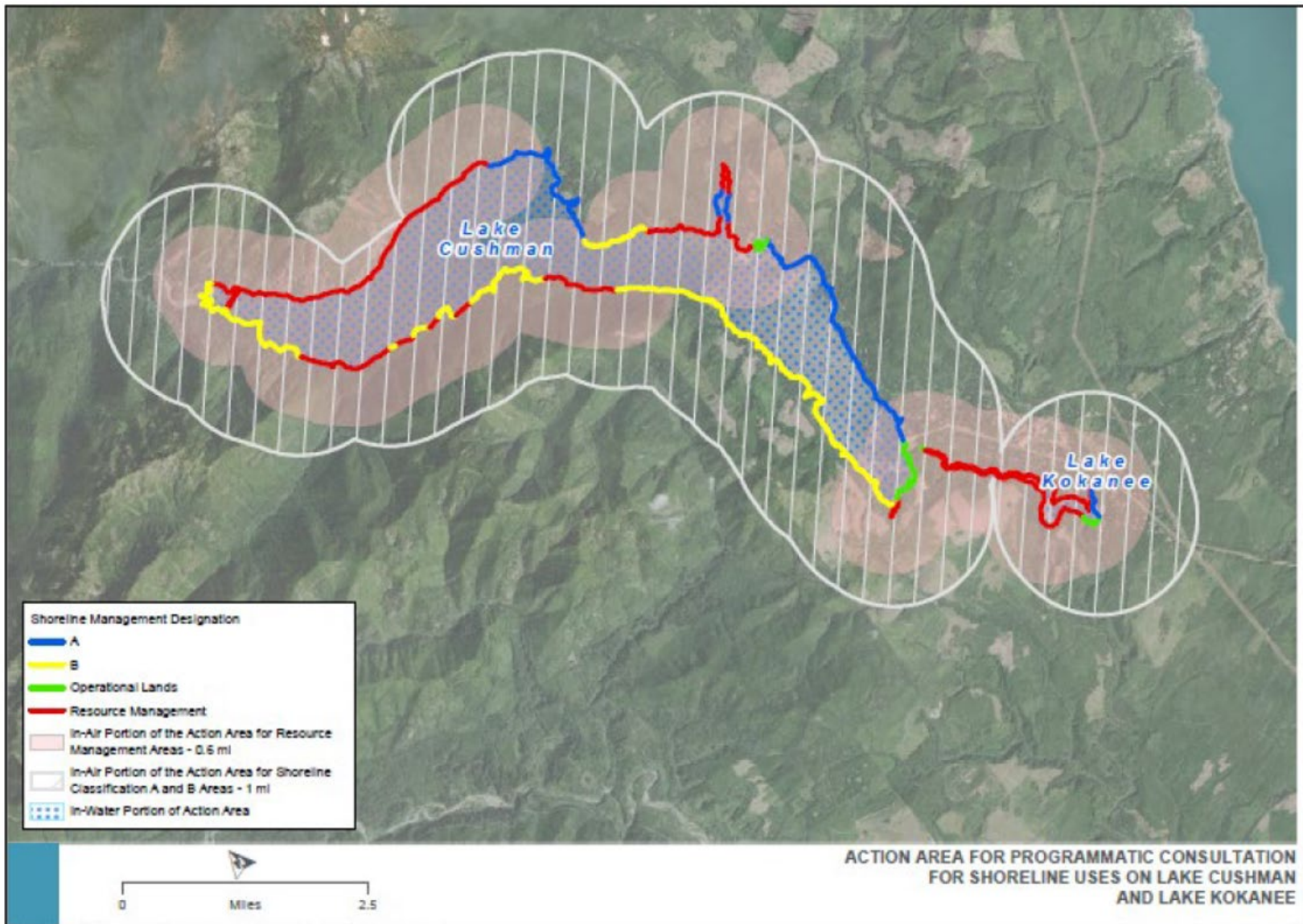


Figure 1 Lakes Cushman and Kokanee; shoreline designations; surrounding landscape and action area (USACE 2023, p. 40).

The aquatic component of the action area for this proposed federal action includes the full extent of the reservoirs and extends upslope to a distance of approximately twice the site potential tree stand height. The terrestrial component of the action area extends to adjacent private, leased, Cushman Hydroelectric Project, and National Forest lands.

Covered activities will affect and/or influence shoreline, riparian, and aquatic habitat conditions throughout Lakes Cushman and Kokanee, and on long temporal timelines (i.e., for the functional life of new, repaired, replaced, and maintained shoreline structures and features). Effects in the uplands will be limited to temporary staging and access, and construction areas and footprints along the jurisdictional shorelines. Temporary sources of elevated sound and visual disturbance will also extend into the uplands, to distances of 0.5-mile to 1.0-mile (USACE 2023, pp. 37-40).

### **Concurrence for Bull Trout**

The NF Skokomish River local bull trout population (including bull trout from Elk and Slate Creeks) is mostly or entirely isolated upstream of Cushman Dam No. 1. Lakes Cushman and Kokanee are located in the Coastal Recovery Unit and Skokomish River bull trout core area. The Skokomish River bull trout core area includes the South Fork (SF) Skokomish River, NF Skokomish River (above and below the Cushman Dams), Vance Creek, and their tributaries. The Skokomish River bull trout core area supports fluvial, adfluvial, and resident life history forms, in both the SF and NF.

#### **Status and Environmental Baseline**

The NF Skokomish River local bull trout population is mostly or entirely isolated upstream of Cushman Dam No. 1. Lake Cushman provides core foraging, migrating, and overwintering (FMO) habitat for subadult and adult bull trout, and supports prey species and abundant prey production, that bull trout rely on throughout the middle and upper NF Skokomish River basin. The action area does not provide suitable spawning or early rearing habitats for bull trout; suitable spawning and early rearing habitats are located upstream in the NF Skokomish River and its tributaries.

Bull trout can be found in all reaches of the Skokomish River watershed below anadromous barriers. Adfluvial bull trout overwinter and mature in large lakes (i.e., the reservoirs), and migrate to upstream tributaries to spawn. Fluvial bull trout overwinter and mature in the larger river reaches and migrate to smaller tributaries to spawn. The SF Skokomish River supports a predominantly fluvial bull trout population; the NF Skokomish River supports adfluvial and fluvial bull trout (Peters et al. 2011, p.158). Regardless of life history form, smaller juvenile and subadult bull trout generally spend months to years in headwaters and in smaller tributaries, where cover and refugia afford protection from predators.

Lake Cushman is essential to the long-term health, growth, and survival of the adfluvial Skokomish River bull trout population. Furthermore, habitats and prey production provided by Lake Cushman, are essential to maintenance of existing bull trout distribution and abundance in the Skokomish River bull trout core area as a whole. The Skokomish River is the only Hood Canal basin that supports local bull trout populations, spawning, and early rearing. While

anadromous bull trout were and are believed to occur in the basin, bull trout exhibiting anadromous life histories are uncommon in the basin today.

The Coastal Recovery Unit for bull trout supports the only anadromous bull trout populations found in the lower 48 states. The Cushman Dams prevent full expression of the anadromous life history form in the Skokomish River bull trout core area. Restoration of full and unimpeded upstream and downstream passage at the Cushman Dams would be required for full expression of the migratory life history forms and for the best possible connectivity between Skokomish River bull trout populations.

Bull trout from the Skokomish River core area are considered at “high risk” for extirpation (USFWS 2008b, p. 35; USFWS 2015b). From 1998 through 2015, peak adult counts for the NF Skokomish River local bull trout population suggested a slowly increasing long-term trend (Figure 2); numbers may have since stabilized. The bull trout population in this core area is one of the most depressed in the Coastal Recovery Unit.

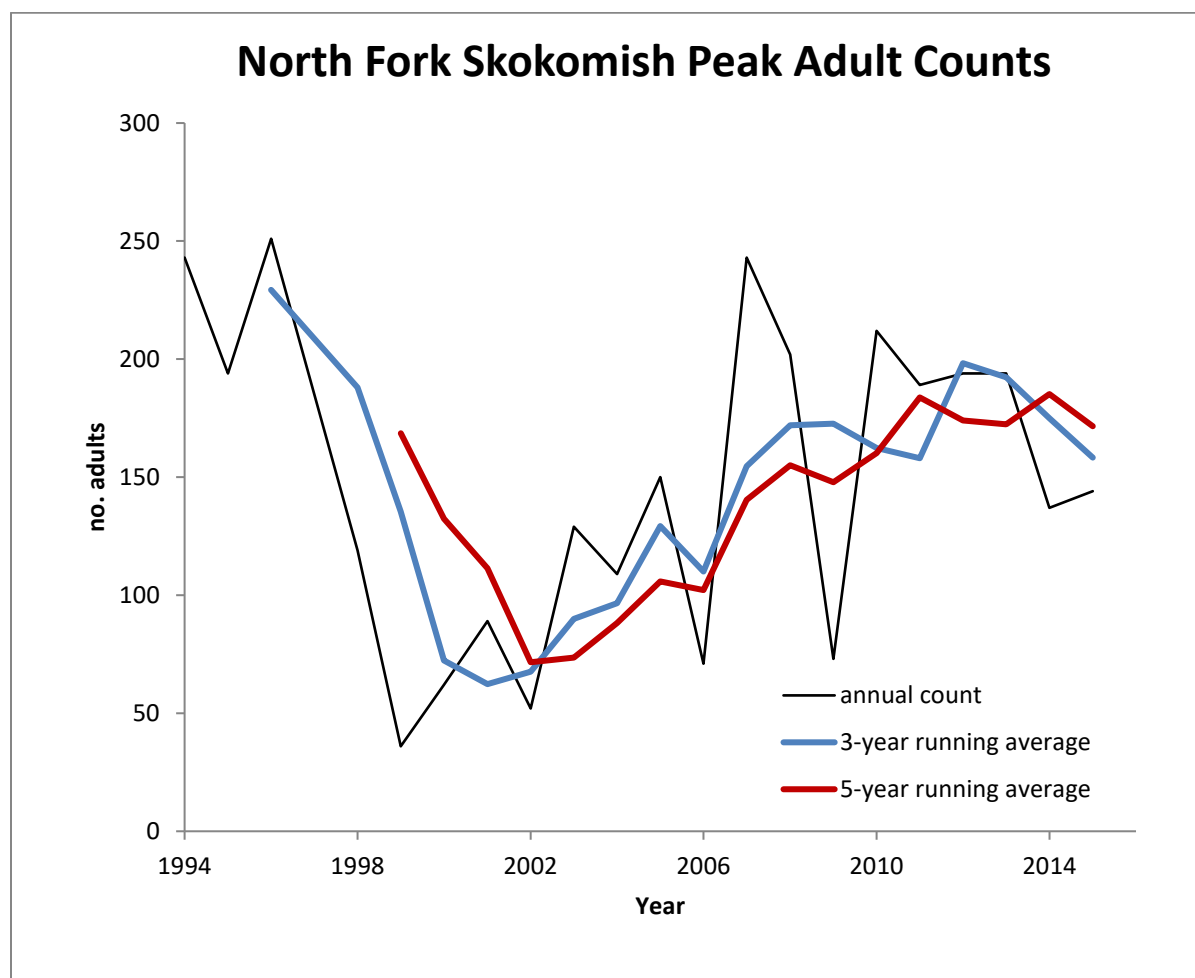


Figure 2 NF Skokomish peak adult counts (1994 through 2015) (Brenkman, *in litt.* 2016).

Two Skokomish River local bull trout populations have been identified: 1) NF Skokomish River (including Elk and Slate Creeks), and 2) SF Skokomish River (including Church Creek). Brown Creek (tributary to the SF Skokomish River) is considered a third, potential local population. With only two known local populations, bull trout from this core area are at increased risk of local extirpation, and adverse effects from random, naturally occurring events (USFWS 2004, pp. 136-137).

The NF and SF Skokomish River bull trout populations are geographically isolated by the Cushman Dams. However, low numbers of bull trout are transported/translocated in most years, via the fish passage facilities and into Lake Cushman. Adult, subadult, and lower numbers of older rearing juvenile bull trout, use the habitats and available resources in Lake Cushman. Based on surveys in the NF Skokomish River, adult bull trout appear to spend much of the year in Lake Cushman and leave the reservoir between September and the end of December to spawn (Brenkman 1998, pp. 38, 54).

According to the Corps and sources cited by the Corps (USACE 2023, p. 42):

“The existing aquatic environment [in Lake Cushman] ... is degraded by a host of anthropogenic changes. Developed portions of the reservoirs have resulted in the construction of numerous public and private residential structures including piers, ramps, floats, and shoreline armoring (e.g., bulkheads) that have modified natural habitat conditions and degraded nearshore habitat quality and function. The Cushman No. 1 and No. 2 Dams and associated structures have also modified aquatic habitat and inhibited anadromous fish migration. Water levels in Lake Cushman can fluctuate up to 21 meters (69 ft) and periodically inundate up to 30 acres of land surrounding the inlet to the reservoir. As a result of fluctuating water levels exposing much of the shoreline during winter months, there is little to no aquatic vegetation along the shoreline, and the lakebeds of the reservoirs are generally steep and severely scoured. Therefore, the existing function of aquatic habitat in the action area is impaired (NMFS 2021) ... Minimal residential development has occurred along the western shore of Lake Cushman, due largely to the inaccessibility of the area (FERC 1996). These minimally developed shorelines are generally part of the Resource Management [shoreline] classification”.

Dam operations significantly and pervasively alter the current function of aquatic (shoreline and nearshore) habitats in Lake Cushman. “Bank armoring and other land use practices ... [have reduced] the amount of functioning riparian vegetation, [interrupted] natural erosion processes that create beaches, and [prevented] the development and recruitment of large wood. Additionally, bank armoring has steepened and hardened beach profiles and simplified shoreline habitat, which reduces habitat for prey (USFWS 2019b)” (USACE 2023, p. 55). Shorelines designated Resource Management are managed by Tacoma Power for specific resource objectives (e.g., protection of water quality; habitat conservation; etc.), and these shorelines and nearshore habitats retain substantially better current function(s).

Despite these degraded conditions, Lake Cushman is a deep, biologically productive, cold-water reservoir. The reservoir provides significant cold water refugia, especially during summer months, and supports abundant sources of prey for bull trout. Lake Cushman and the upper NF

Skokomish River basin support populations of Chinook salmon (*Oncorhynchus tshawytscha*), mountain whitefish (*Prosopium williamsoni*), cutthroat trout (*O. clarkii*), rainbow trout (*O. mykiss*), kokanee (*O. nerka*), longnose sucker (*Catostomus catostomus*), sculpin (*Cottus* spp.), speckled dace (*Rhinichthys osculus*), and non-native largemouth bass (*Micropterus salmoides*) (Brenkman et al. 2017 in USACE 2023, p. 41). Rainbow and cutthroat trout are considered the dominant species in Lake Cushman (Tacoma Power 2012 in USACE 2023, p. 41). Downstream of the dams, anadromous salmonids that currently or historically use the river include early returning (spring or summer) and late-returning (fall) runs of Chinook salmon, fall coho salmon (*O. kisutch*), summer and winter steelhead (*O. mykiss*), chum salmon (*O. keta*), sockeye salmon (*O. nerka*), pink salmon (*O. gorbuscha*), and sea-run cutthroat trout (Brenkman et al. 2017 in USACE 2023, p. 41). Within the action area, non-native and introduced fish species represent both an exploitable prey base for bull trout and may compete with (or rarely prey upon) bull trout.

### Effects of the Action

The USFWS expects that temporary, construction-related exposures and effects to individual bull trout will be insignificant and/or discountable. The Corps has assessed and described the foreseeable construction exposures and effects, including those potentially resulting from use or operations of heavy equipment, excavation of the bed and banks, pouring and placement of concrete in the nearshore/ shoreline, placement/installation and removal of piles (including impact pile driving), and temporary impacts to vegetation resulting from staging, access, and construction (USACE 2023, pp. 61-64).

Implementation of the following avoidance and minimization measures will avoid adverse exposures and effects to bull trout:

All activities in Lake Cushman must occur in the dry when the reservoir is drawn down (i.e., below the full pool elevation of 738 ft) and the work area is above the water surface elevation. Work within the OHWM must occur when the full pool elevation is a minimum of 5 ft waterward of proposed activities (i.e., 5 ft of dry land between water and work area) (USACE 2023, p. 15).

Activities proposed below the OHWM of Lake Kokanee must occur between July 1 and October 1, or when the lake is drawn down below the work area, or as determined by the WDFW during HPA review (USACE 2023, p. 15).

With full and successful implementation of the required avoidance and minimization measures, the USFWS expects that temporary, construction-related exposures and effects to individual bull trout will be insignificant and/or discountable, and potential exposures will not significantly disrupt or impair the behavior of individual bull trout, injure bull trout, or cause mortality.

*Spills and Contaminants* – Vehicles and heavy equipment will operate in/from designated staging and access areas. The Corps' applicants will implement spill prevention, control, and containment best management practices, and these will prevent contaminants (e.g., petroleum products, hydraulic fluid, fresh concrete, sediments, sediment-laden water, chemicals, or any

other toxic or harmful materials) from entering waters. We conclude that significant releases to the environment are extremely unlikely, and it is also extremely unlikely that bull trout or their prey will be exposed to a fuel or chemical spill during implementation of the proposed action. Exposure to contaminants or other effects resulting from a spill are considered discountable (extremely unlikely).

*Temporary Impacts to Water Quality (including Elevated Turbidity)* – The action area includes waters within 300 ft of construction to account for turbidity. All or nearly all of the excavation and placement of fill will be completed a minimum of 5 ft from water (with limited exceptions for Lake Kokanee) and water quality impacts will be adaptively managed and controlled during construction. With full and successful implementation of the conservation measures, any temporary increases in turbidity will not result in a significant deviation from the baseline conditions. Foreseeable bull trout exposures and effects are considered insignificant.

*Installation of Piles (Including Impact Pile Driving), Underwater Sound Exposures* – All or nearly all of these activities will be completed a minimum of 5 ft from water (with limited exceptions for Lake Kokanee). According to the Corps (USACE 2023, p. 63), “If [underwater sound] from impact driving of piles in the dry is transmitted to the reservoir, fish will not be exposed to levels that approach [thresholds] for injury or harm”. Based on the best available scientific information, the USFWS concurs with this finding and conclusion. With full and successful implementation of the conservation measures, any temporary increases to underwater sound resulting from installation of piles (vibratory and impact pile driving) will not significantly disrupt or impair behavior, or injure bull trout. Foreseeable exposures and effects to bull trout are considered insignificant.

*Entrainment, Entrapment, and Stranding* – All or nearly all of the covered activities will be completed a minimum of 5 ft from water (with limited exceptions for Lake Kokanee); and, any depressions on the bed created during or resulting from construction, will be filled prior to inundation. Significant exposures or effects to bull trout, in the forms of entrainment, entrapment, or stranding, are considered discountable (extremely unlikely).

The proposed federal action includes no construction activities, practices/ methods, or potential exposures that are likely to have measurable adverse effects to bull trout, or significantly disrupt normal bull trout behaviors (i.e., feeding, moving, and sheltering). The USFWS expects that bull trout will continue to successfully feed, move, and shelter in the action area during and after construction.

*Effects to Habitat That Supports Feeding, Moving, and Sheltering* – The proposed federal action, and its interrelated and interdependent actions, will have measurable short- and long-term effects, including beneficial effects, to shoreline and nearshore habitat functions in the action area (Lakes Cushman and Kokanee). The proposed federal action will have both limited adverse effects and limited beneficial effects to the current functions of designated bull trout critical habitat. For a full discussion of the foreseeable effects to the Primary Constituent Elements (PCEs) and functions of designated bull trout critical habitat, see the body of the Opinion.

At the scale of individual project(s) and applicant(s) or lessee(s), the USFWS expects that some degraded shoreline and nearshore habitat functions will be maintained. Repair, replacement, and maintenance of structural shoreline stabilization measures, overwater structures, boat ramps, and (limited) new or ancillary structures, will extend the functional lives of these features, and limit some natural shoreline processes.

As described by the Corps, repair, replacement, and maintenance “...fills or structures ... extend the life of the existing fills or structures ... [and] diminish the availability and function of nearshore and shoreline habitat[s] [for] the life of the structures ... [an estimated] 40 [to] 50 years” (USACE 2023, pp. 64, 65). “New structures ... [result] in ... reduction or modification [of] available nearshore habitat that juvenile salmonids, particularly juvenile ... Chinook salmon, use for rearing and migration”; even though, “the existing ... habitat ... is of low quality for salmonid rearing” (USACE 2023, p. 66). However, “The only authorized activities ... [along shorelines] in Resource Management classification ... [will be] public boat ramps ... As a result, ... undeveloped [shorelines] will continue to function as they do under existing conditions ... [and] functions ... will be maintained” (USACE 2023, p. 61).

Some activities will continue to have localized adverse effects to aquatic habitat functions. The programmatic will maintain some degraded habitat conditions and continue to impair and preclude some natural shoreline processes that are important to the maintenance and development of complex nearshore aquatic habitats; including, recruitment of and natural sources of sediment; recruitment of and natural sources of large wood; and, formation of variable depths, gradients, and substrate profiles.

However, the USFWS also expects that full and successful implementation of the program of ESA coverage and required avoidance and minimization measures will achieve a meaningful long-term reduction of impacts and effects at the scale of many individual project(s) (applicants or lessees) and the action area. The relevant, required, avoidance and minimization measures include non-structural shoreline stabilization measures (where feasible); reduced overwater footprints/ coverage; increased use and improved configuration of light-transmissive grating; significant removal of creosote-treated wood and associated water and sediment contamination; wider use of inert and environmentally-sensitive materials (including encapsulated floatation); preservation, maintenance, and replacement of functioning, native riparian vegetation; and, specific and deliberate habitat improvements (including removal of derelict structures and debris, and placement/ installation of large wood). The USFWS expects that the improved design guidelines and specifications will result in repaired and replaced structures that require less frequent maintenance over the long-term. A reduced number and frequency of maintenance activities, repairs, and replacements will further avoid the damage and disruption caused by these repetitive activities.

As described by the Corps, “The [net] loss of functional shoreline resulting from new and replaced structures is unlikely to measurably reduce the abundance of bull trout prey, including macroinvertebrates and small fish”; “new and replaced in-water structures will not prevent bull trout from moving through the action area”; and, “beneficial effects on water quality may result from [implementing the proposed action]” (USACE 2023, p. 80). The USFWS agrees with these conclusions. We expect that with implementation of the programmatic, bull trout will continue



to find abundant prey resources in the action area; bull trout will face no additional or measurably greater impediments to movement, migration, sheltering, or overwintering at the scale of the action area; and, the significant bull trout conservation role provided by Lakes Cushman and Kokanee will be maintained.

With full and successful implementation of the required avoidance and minimization measures, the USFWS expects that resulting long-term shoreline and nearshore habitat functions will not significantly disrupt or impair the behavior of individual bull trout, and will continue to support successful bull trout feeding, moving, and sheltering in the action area. The foreseeable effects of the proposed action are therefore considered insignificant.

### **Concurrence for Marbled Murrelet**

The marbled murrelet (*Brachyramphus marmoratus*; murrelet) was listed as a threatened species in 1992. Murrelets are small north Pacific seabirds from the family Alcidae, which also includes the auklets, guillemots, murres, and puffins. Murrelets forage in marine waters; in Washington, throughout the Puget Sound (including Hood Canal) and coastal nearshore continental waters. Murrelets nest in older-aged coniferous forests, where they prefer large, mature, contiguous stands, particularly stands that offer close or relatively close proximity to suitable marine foraging habitat. Most nests are within 37 miles of the coast, although behavior indicative of nest site occupancy has been recorded as far as 52 miles inland and murrelets have been detected up to 70 miles inland in Washington (Huff et al. 2006, p. 10) (Figure 3).

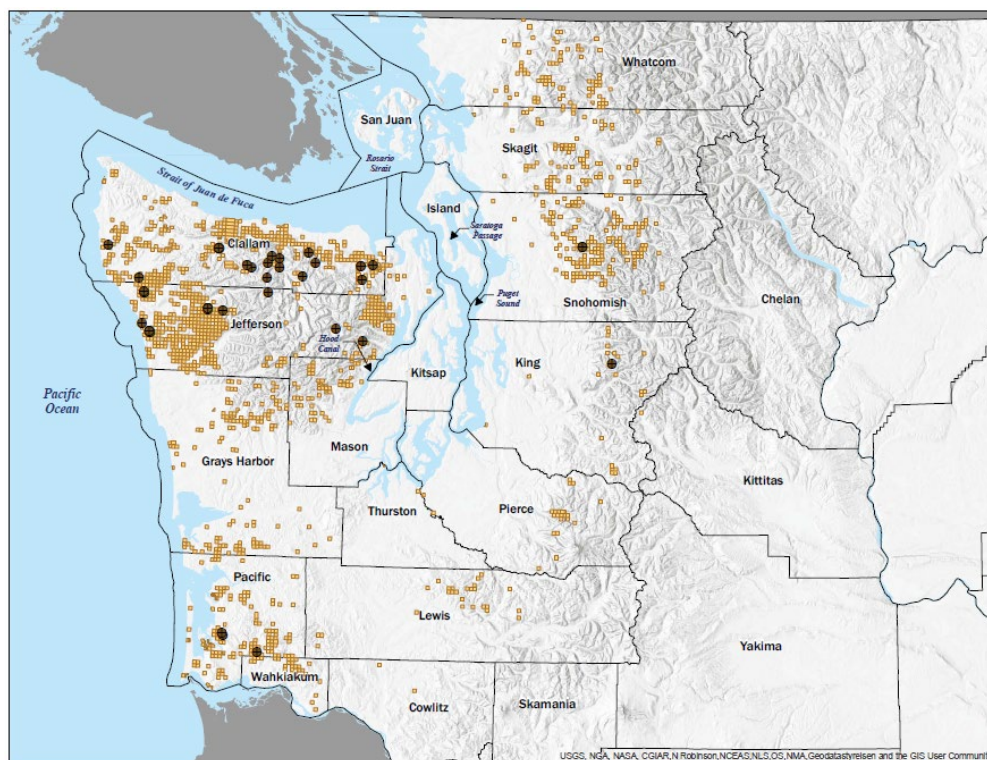


Figure 3 Known murrelet nest sites and sections containing detections in Washington. (WSDOT-FHWA 2017)



Nests occur primarily in large older-aged trees. Suitable nest platforms include limbs or other branch deformities that are greater than four inches in diameter and greater than 33 ft above the ground (see Appendix A: Guidance for Identifying Marbled Murrelet Nest Trees in Washington State, Washington Fish and Wildlife Office, Lacey, Washington, April 2012). Suitable nest platforms also require good vertical and horizontal cover; murrelet nests are vulnerable to predation and trees and stands that do not benefit from good cover (e.g., nest sites selected along an edge or large break in the canopy) may often be unproductive. In Washington, the murrelet breeding season extends from April 1 to September 23.

The recovery plan for the murrelet in Washington, Oregon, and California (USFWS 1997, p. 115) identifies six Conservation Zones throughout the listed range of the species. Conservation Zone 1 (Puget Sound) includes all of the Puget Sound and much of the Strait of Juan de Fuca south of the U.S.-Canada border. Within Conservation Zone 1, murrelets tend to forage in well-defined areas during the breeding season. They are found in the highest densities in the nearshore waters of the San Juan Islands, Rosario Strait, the Strait of Juan de Fuca, Admiralty Inlet, and Hood Canal. They are more sparsely distributed elsewhere in Puget Sound, with smaller numbers observed within the Nisqually Reach, Possession Sound, Skagit Bay, Bellingham Bay, and along the eastern shores of Georgia Strait. In the most southern end of Puget Sound, they occur in extremely low numbers. During the non-breeding season murrelets typically disperse and are found farther from shore (Strachan et al. 1995).

As part of the USFWS's most recent 5-year review of the current status of the murrelet, we identified new threats and stressors across the listed range of the species, including several environmental factors affecting murrelets in the marine environment:

- Habitat destruction, modification, or curtailment of the marine environmental conditions necessary to support murrelets due to elevated levels of polychlorinated biphenyls in murrelet prey species; changes in prey abundance and availability; changes in prey quality; harmful algal blooms that produce biotoxins leading to domoic acid and paralytic shellfish poisoning; and, climate change in the Pacific Northwest.
- Manmade factors including derelict fishing gear leading to mortality from entanglement; energy development projects (wave, tidal, and on-shore wind energy projects); and, disturbance in the marine environment (e.g., sound pressures caused by pile-driving, underwater detonations, vessel traffic).

The marine environment will play an essential role in the recovery of the murrelet. Murrelets spend the majority of their lives in marine waters. Protecting the quality of the marine environment is identified in the recovery plan as an integral part of the recovery effort (USFWS 1997, p. 120). If marine waters and foraging areas are degraded and do not provide sufficient prey resources, individual murrelet fitness and reproductive success will be reduced.

The murrelet Recovery Implementation Team convened and led by the USFWS found that sustained low recruitment is the most likely cause for the observed, continuing population declines (USFWS 2012b, cover letter, pp. 10, 11, 22); major mechanisms contributing to this trend include: changes in marine forage conditions affecting the abundance, distribution, and quality of prey; and, cumulative and interactive effects, including the "...disconnect between [high] quality marine and terrestrial habitats...", or the lack of adequate marine and terrestrial

habitat “coupling” (USFWS 2012, pp. 11, 13). Throughout the Puget Sound and Conservation Zone 1, much of the remaining, functional nesting habitat is located far from marine waters. In this portion of the murrelet’s range, where there is a “...significant distance between marine areas and remaining nesting habitat ... [the] energetic costs of the commute [are] probably highest”, and limit reproductive success (USFWS 2012, p. 13).

## Effects of the Action

The aquatic component of the action area extends upslope to a distance of approximately twice the site potential tree stand height. The terrestrial component of the action area extends to adjacent private, leased, Cushman Hydroelectric Project, and National Forest lands. Effects in the uplands will be limited to temporary staging and access, and construction areas and footprints along the jurisdictional shorelines. Temporary sources of elevated sound and visual disturbance will also extend into the uplands to distances of 0.5-mile to 1.0-mile (USACE 2023, pp. 37-40).

The following conservation measures address disturbance of vegetation (USACE 2023, p. 21), and will be implemented by the Corps and their applicants to avoid impacts that would remove or degrade functioning physical habitat for the murrelet:

- Existing habitat features (e.g., vegetation, large wood) shall be retained to the extent possible to avoid causing erosion and to maintain food sources, shading, and other ecological functions important to water quality and aquatic species.
- Disturbance of bank vegetation shall be limited to a 12-ft work corridor on either side of the proposed work.
- Tree removal associated with actions covered under this programmatic is prohibited unless the applicant provides an arborist report stating that trees represent a hazard to life or property. This measure will protect trees along the shoreline and ensure that they can contribute to future large wood recruitment in the reservoirs.
- Suitable nesting habitat(s) for marbled murrelets or northern spotted owls will not be removed as part of any activities covered under this programmatic.
- Trees that must be removed should be re-installed along the nearshore as downed habitat features where possible. Any anchors for securing large wood should be buried.
- Areas where vegetation has been temporarily disturbed during staging, access, or construction must be restored to pre-disturbance conditions.
- All disturbed areas must be protected from erosion within 7 calendar days of completion of the project using vegetation or other means.

“The action area [includes] conifer-dominated forest, although the surrounding area outside of Olympic National Forest has been altered by past forestry [practices] (i.e., logging) ... Contiguous stands (i.e., at least 5 acres in size) of conifer-dominated forest ... [are present adjacent to shorelines designated] Resource Management ... [and] extensive murrelet surveys ... indicate potential occupancy or nesting ... [Particularly,] in the Copper Creek and/or Bear Gulch drainages ... [in] the northwest corner of ... the action area” (USACE 2023, pp. 49, 50). Only

“the in-air portion of the action area [i.e., that portion of the action area defined for temporary sources of elevated sound] overlaps designated critical habitat for [the] murrelet” (USACE 2023, p. 70).

The proposed federal action, consisting of implementation of a program of ESA coverage for specific shoreline activities and successful implementation of the identified avoidance and minimization measures (including design guidelines, design criteria, required procedures, and specifications), will avoid measurable direct impacts to functioning physical habitat (i.e., trees or stands providing suitable murrelet nest platforms or associated cover). The covered activities and their unavoidable impacts to vegetation will not remove or degrade suitable murrelet habitat, will not preclude or reduce future nesting opportunities in the larger action area, and will not significantly disrupt normal murrelet behaviors (i.e., the ability to successfully feed, move, and/or shelter).

The proposed federal action ‘may affect, but is not likely to adversely affect’ the murrelet (USACE 2023, p. 78). Temporary sources of sound and visual disturbance, sufficient to cause missed feedings and/or a flushing response, will not extend to suitable and potentially occupied murrelet nesting habitat. Adult murrelets will not be prevented from making successful transiting flights through the action area (i.e., between suitable foraging and nesting habitats). The foreseeable effects of the proposed federal action will not significantly disrupt normal murrelet behaviors (i.e., the ability to successfully feed, move, and/or shelter) and are therefore considered insignificant.

### **Concurrence for Northern Spotted Owl**

The northern spotted owl (*Strix occidentalis caurina*) was listed as a threatened species in 1990 (55 FR 26114; June 26, 1990). Northern spotted owls generally rely on older forested habitats because these forests contain the structure and characteristics required for nesting, roosting, and foraging. Features that support nesting and roosting typically include a moderate to high canopy closure (60 to 80 percent); a multi-layered, multi-species canopy with large overstory trees (i.e., trees with a diameter-at-breast-height, dbh, greater than 30 inches); a high incidence of large trees with various deformities (large cavities, broken tops, mistletoe, and other decadence); large snags; large accumulations of fallen trees and other woody debris on the ground; and, sufficient open space below the canopy to fly (Thomas et al. 1990, p. 19). Northern spotted owls do also use younger forested stands that have the structural characteristics of older forests or that retain structural elements from the previous forest.

Rangewide, northern spotted owl populations have been declining at an average rate of 3.8 percent per year since intensive studies began in the 1980s (Dugger et al. 2016, pp. 70-71). The species is at increasing risk of extirpation. Historically, northern spotted owls were distributed throughout much of the western Washington lowlands, but now are considered very rare in that portion of their range. The species now occurs primarily on the eastern and western slopes of the Cascades at elevations up to 5,000 ft, and on the Olympic Peninsula at elevations ranging from sea level up to 3,500 ft (Buchanan 2016) (Figure 4).

Northern barred owls (*Strix varia varia*) have dramatically expanded their range in western Washington and throughout the Pacific Northwest. Northern barred owls are larger, more aggressive, and more adaptable than northern spotted owls; barred owls displace spotted owls, disrupt their nesting, and compete for food, with significant landscape-scale consequences for the long-term viability of northern spotted owl populations (see Barred Owl Management, <<<https://www.fws.gov/project/barred-owl-management>>>).

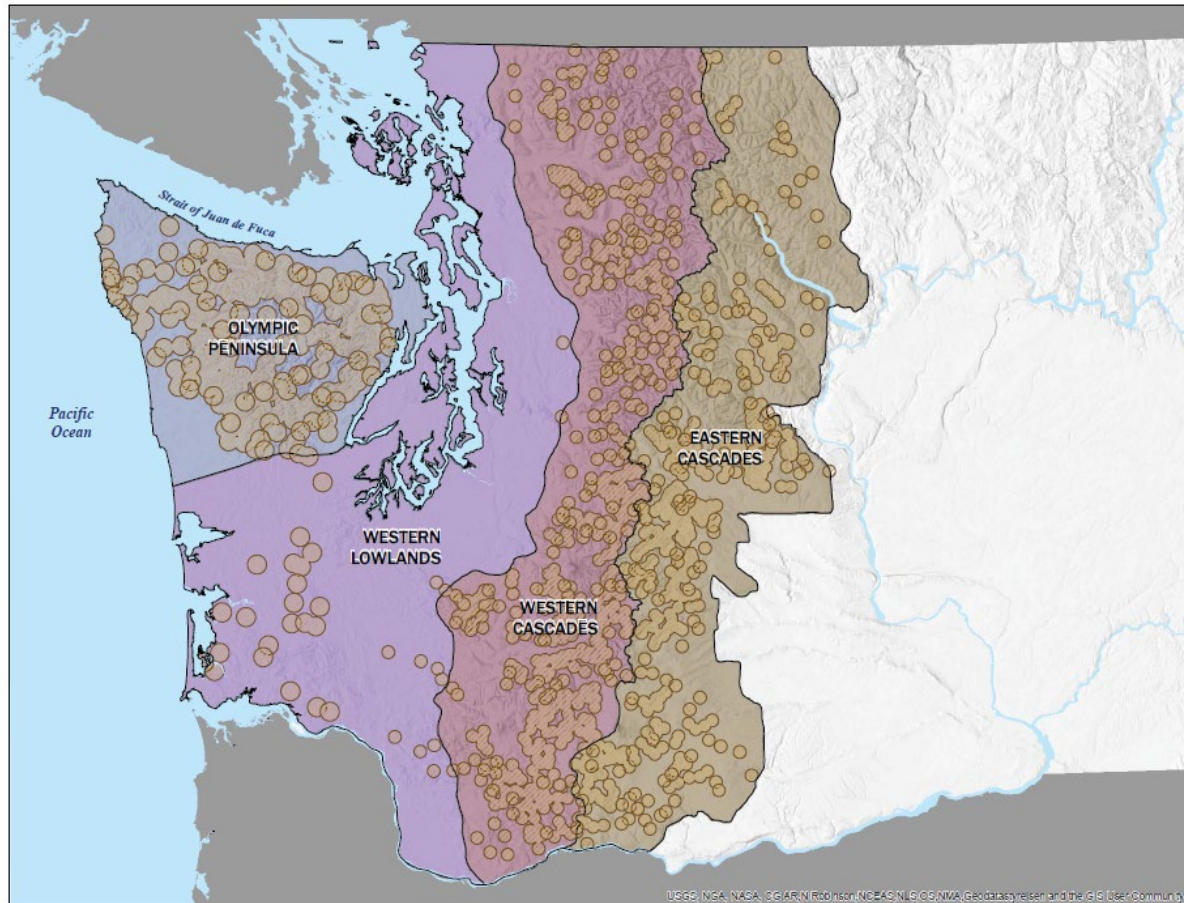


Figure 4 Provinces and historic northern spotted owl territories in Washington.  
(WSDOT-FHWA 2017)

### Effects of the Action

The aquatic component of the action area extends upslope to a distance of approximately twice the site potential tree stand height. The terrestrial component of the action area extends to adjacent private, leased, Cushman Hydroelectric Project and National Forest lands. Effects in the uplands will be limited to temporary staging and access, and construction areas and footprints along the jurisdictional shorelines. Temporary sources of elevated sound and visual disturbance will also extend into the uplands to distances of 0.5-mile to 1.0-mile (USACE 2023, pp. 37-40).

The conservation measures described/listed above address disturbance of vegetation (USACE 2023, p. 21), and will be implemented by the Corps and their applicants to avoid impacts that would remove or degrade functioning physical habitat for the northern spotted owl.

“Although forests with [older, mature] characteristics occur throughout the NF Skokomish [River basin], [especially] in Olympic National Park, most of the forests ... [in the action area] are not suitable habitat for [northern spotted owls], because they ... lack the ... characteristics required by the species (FERC 1996) ... The action area is located within conifer-dominated forest ... only marginally suited to provide habitat ... However, dispersing individual [northern spotted owls] could be present in the action area” (USACE 2023, p. 51). Only “the in-air portion of the action area [i.e., that portion of the action area defined for temporary sources of elevated sound] overlaps designated critical habitat for [the northern spotted] owl” (USACE 2023, p. 70).

The proposed federal action, consisting of implementation of a program of ESA coverage for specific shoreline activities, and successful implementation of the identified avoidance and minimization measures (including design guidelines, design criteria, required procedures, and specifications), will avoid measurable direct impacts to functioning physical habitat (i.e., trees or stands providing suitable northern spotted owl nesting or foraging habitat). The covered activities and their unavoidable impacts to vegetation will not remove or degrade suitable northern spotted owl habitat, will not preclude or reduce future nesting, foraging, or dispersal opportunities in the larger action area, and will not significantly disrupt normal northern spotted owl behaviors (i.e., the ability to successfully feed, move, and/or shelter).

The proposed federal action ‘may affect, but is not likely to adversely affect’ the northern spotted owl (USACE 2023, p. 79). Temporary sources of sound and visual disturbance, sufficient to cause missed foraging opportunities, missed feedings, and/or a flushing response, will not extend to suitable and potentially occupied northern spotted owl nesting or foraging habitats. Young northern spotted owls will not be prevented from successfully dispersing or moving through the action area (i.e., in search of suitable nesting habitat, when establishing new territories, etc.). The foreseeable effects of the proposed federal action will not significantly disrupt normal northern spotted owls’ behaviors (i.e., the ability to successfully feed, move, and/or shelter), and are therefore considered insignificant.

## **4 BIOLOGICAL OPINION**

## **5 DESCRIPTION OF THE PROPOSED ACTION**

A federal action means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas (50 CFR 402.02). The complete Project Description appearing in the Corps’ BA is incorporated here by reference (Programmatic Biological Assessment – Repair, Replacement, Maintenance, and Limited New Shoreline Activities on Lake Cushman and Lake Kokanee; June 9, 2023; Prepared by HDR, Inc. 128pp.).

### **5.1 Purpose and Intent**

The proposed federal action includes implementation of a program of ESA coverage for specific shoreline activities (Covered Activities), that are proposed within or accompanying a Corps Clean Water Act (CWA) permit application, on Lake Cushman and/or Lake Kokanee. Lake

Cushman and Lake Kokanee are flow-regulated reservoirs located on the North Fork (NF) Skokomish River, above Cushman Dam Numbers 1 and 2 respectively. Lake Cushman and Lake Kokanee are managed by the City of Tacoma, Department of Public Utilities – Light Division (Tacoma Power), as part of the Cushman Hydroelectric Project (Federal Energy Regulatory Commission, FERC, Project No. 460) (USACE 2023, pp. 1, 6).

The framework for this program of ESA coverage was developed collaboratively by the Corps, Tacoma Power, the USFWS, and the National Oceanic and Atmospheric Administration (NOAA) – National Marine Fisheries Service (NMFS). The parties also received constructive input and support from staff working for the Skokomish Indian Tribe, Natural Resources Department. The parties developed the framework and program of ESA coverage with the goal of achieving two principal objectives (USACE 2023, pp. 1, 5):

1. Support for consistent and more efficient administration of Corps CWA permit authorities on Lakes Cushman and Kokanee; and,
2. Support for basin-scale conservation of natural shoreline environments and processes, and the unique biological resources (including ESA-listed salmonids) that rely on these natural shoreline environments and processes.

The proposed federal action and framework will provide ESA coverage for commonly authorized, specific shoreline activities (Covered Activities), provided that all relevant conservation measures can and will be effectively implemented by the Corps’ permit applicant(s) (USACE 2023, pp. 1, 5).

## **5.2 Covered Activities**

The list of commonly authorized, specific shoreline activities that are addressed with this framework and Opinion (Covered Activities), include the following (USACE 2023, pp. 1, 15-17, including Table 2-1):

Category A. Repair, Replacement, or Maintenance of Existing Shoreline Stabilization Measures; Boat Ramps (Community and/or Public); Docks/Piers (Single-Family, Shared, and Community); Stairways/Steps, Walkways, and Paths; and, Temporary Uses/Temporary Access.

Category B. New or Ancillary Structures, including Docks/Piers (Shared), Mooring Buoys, Swimming Floats, and Lighting.

Category C. Habitat Improvement Actions.

Table 1 (below) provides a summary of the covered activities (USACE 2023, pp. 16, 17).

The Corps’ CWA permit authority regulates the discharge of dredged or fill material into waters of the United States. In freshwater, the limit of jurisdiction is the ordinary high-water mark (OHWM) and adjacent wetlands (33 CFR 328.4). At Lake Cushman and Lake Kokanee, the Corps jurisdictional boundary is the OHWM (USACE 2023, p. 2). And, “Local shoreline permitting generally follows the 738.0-ft contour around ... Lake Cushman (i.e., the full pool

elevation per Cushman Datum), and the 478.0-ft contour around Lake Kokanee (i.e., the full pool elevation per Cushman Datum)” (USACE 2023, p. 6).

This program of ESA coverage includes conservation measures that implement the Corps’ CWA authorities, inclusive of design guidelines, design criteria, required procedures, and specifications, and that also extend to related specific shoreline activities that may not be under the strict jurisdiction of the Corps (USACE 2023, p. 2). “For purposes of this proposed action, in order for the programmatic suite of activities to have predictability regarding [their] combined effects ... and consequences ... certain aspects ... that may not be under the jurisdiction of the Corps are nevertheless limited by design criteria” (USACE 2023, p. 2).

### **5.3 Excluded Activities**

The following specific shoreline activities are excluded from programmatic ESA coverage (USACE 2023, pp. 12, 13), and their effects are not addressed by the Opinion:

Excluded. New, Repaired, or Replaced Community Park; Commercial Dock/Pier; Public Dock/Pier; Marina; Recreation Site; and, Floating Boom.

Excluded. New Single-Family Dock/Pier, and New Community Dock/Pier.

Excluded. New Structural Shoreline Stabilization Measures.

Excluded. New or Maintenance Dredging.

Table 1 Summary of Covered Activities (USACE 2023, pp. 16, 17).

Category	Subcategory and Covered Activity	Covered Activity Details	Allowable Activity per Shoreline Classification <sup>a</sup>		
			A	B	Resource Management
<b>Category A: Repair, Replace, Maintain In-Place <sup>b</sup></b>	A1. Shoreline Stabilization Measures - Structural and Non-Structural	Repair, replacement, and/or maintenance of existing shoreline stabilization measures, including structural measures (e.g., concrete, rock, or lumber, <sup>c</sup> including bulkhead, footings, and/or foundations) and non-structural measures (e.g., natural shorelines or bioengineering).	Structural: Considered  Non-Structural: Allowed	Structural: Considered  Non-Structural: Allowed	Structural: Prohibited  Non-Structural: Considered
	A2. Boat Ramps - Community and Public	In-place repair, replacement, or maintenance of existing community and public boat ramps comprised of poured concrete, concrete planks, and/or packed gravel.	Community: Considered Public: Allowed	Community: Prohibited Public: Allowed	Community: Prohibited Public: Considered
	A3. Dock - Single Family, Shared, and Community <sup>d</sup>	Repair or replacement of non-commercial dock structure (including pile installation and removal).	Allowed	Allowed	Prohibited
	A4. Stairways/Steps and Walkways; Paths	Repair or replacement of existing stairway/steps, walkways, and paths.	Allowed	Allowed	Prohibited
	A5. Temporary Use/Temporary Access	Temporary uses that require a CWA Section 404 permit (e.g., Use of construction-related materials during reservoir drawdown [e.g., bulk bags, sandbags] to access site).	Allowed	Allowed	Considered



Table 1 Summary of Covered Activities (USACE 2023, pp. 16, 17) (continued).

Category	Subcategory and Covered Activity	Covered Activity Details	Allowable Activity per Shoreline Classification <sup>a</sup>		
			A	B	Resource Management
<b>Category B: New or Ancillary Structures</b>	B1. Dock – Shared	New shared dock structures for use by at least 3 or more lessees who share a single dock, if the action results in the removal of at least one existing single family dock.	Allowed	Allowed	Prohibited
	B2. Mooring Buoy; Swimming Float	Mooring buoys and swimming floats.	Considered	Considered	Prohibited
	B3. Lighting <sup>e</sup>	Lighting (associated with repair/replace actions of e.g., docks/piers).	Considered	Considered	Prohibited
<b>Category C: Habitat Improvement Actions</b>	Includes habitat improvement actions that may accompany actions requiring a CWA permit.	Actions include: derelict debris removal, use of encapsulated floats, removal of treated wood pilings, reduction in overwater structure footprint, replacement of decking with grated surface, large wood installation)	Allowed	Allowed	Considered

<sup>a</sup> Shoreline Management Classifications are defined under the Project's SMP (Tacoma Power 2012), as outlined in the SUSPG (Tacoma Power 2014 or the most recent version thereof). These classifications are relevant to the ESA consultation because the locations of proposed activities will be constrained to areas that are currently subject to development. Shorelines with more prohibited uses will be maintained because actions therein are disallowed under the SUSPG.

<sup>b</sup> In-place equates to repair/replacement/maintenance of structures within the same footprint and location of existing structure, with an allowed expansion no greater than 10 percent beyond the original footprint, below the OHWM, for shoreline stabilization and boat ramps.

<sup>c</sup> The use of pressure-treated lumber is not authorized under this consultation in any location.

<sup>d</sup> For the purposes of this consultation, a dock is a structure built over or floating upon the water that abuts the shore and is used to provide water access or moorage facility for watercraft. Docks include any combination of piers, ramps, and floats attached to the shore.

<sup>e</sup> Electrical below the 742-foot elevation contour or within the reservoir is not permitted (Section 2.3.3). Lighting associated with docks must be solar or battery operated.

## 5.4 Shoreline Management Classifications

Table 1 (above) refers to the Shoreline Management Classifications ('A', 'B', 'Resource Management', etc.), when describing where on Lakes Cushman and Kokanee the covered shoreline activities may be permitted and implemented. According to Tacoma Power's *Shoreline Use Specifications and Permitting Guidelines* (Tacoma Power 2014):

Designated 'A' shorelines are potentially suitable for the widest variety of allowable and permissible uses;

Designated 'B' shorelines are rural in character/setting; more selective uses are allowable and permissible;

Shorelines designated 'Resource Management' are managed by Tacoma Power for specific resource objectives (e.g., protection of water quality; habitat conservation; etc.);

Shorelines designated 'Operational Lands' are reserved and managed by Tacoma Power for FERC/Cushman Hydroelectric features (e.g., dams, spillways; etc.).

Figure 1 depicts Lakes Cushman and Kokanee, the surrounding landscape, the designated 'A', 'B', and 'Resource Management' shorelines, and 'Operational Lands' (USACE 2023, p. 40).

## 5.5 Administrative Procedures

The agreed-upon administrative procedures have been described in detail and are incorporated here by reference (USACE 2023, pp. 8-11). What follows is only a brief summary.

This program of ESA coverage will be effective upon issuance of the USFWS's Opinion. Standard ESA reinitiation 'triggers' apply and may warrant or require that the Corps consider and/or request reinitiation of consultation (i.e., on the program of coverage and/or foreseeable effects) at a later date. Unless extended with agreement by all parties, this program of ESA coverage will expire with the existing FERC license, on or about 2048.

The Corps will review CWA permit applications on Lakes Cushman and Kokanee, to confirm and/or seek adjustments and confirm, that all relevant conservation measures are met (inclusive of design guidelines, design criteria, required procedures, and specifications). Interdependent shoreline activities and work will be considered and permitted by the Corps together; and, Corps applicants may not separate, and will not pursue separate ESA consultation requests, for interdependent shoreline activities and work.

The Corps will prepare and submit to the USFWS, individual notifications for permits/applicants seeking ESA coverage under the programmatic. Each submittal must be complete (USACE 2023, p. 9), and must contain sufficient information to demonstrate compliance with all of the relevant conservation measures.

For each individual project notification, the USFWS will endeavor to respond to the Corps within 30 days of receipt. If a minor deviation(s) from the relevant conservation measures is identified or requested, or if the USFWS provides notice and a request for extension, the USFWS will endeavor to respond to the Corps within 60 days of receipt. Minor deviations from the relevant conservation measures will be considered on a case-by-case basis; these may not result in foreseeable effects that exceed the effects addressed by the Opinion.

With their reply, the USFWS will either (a) verify and confirm coverage of the permit/applicant under the programmatic; or will, (b) communicate the reason(s) for not confirming coverage under the programmatic. If the permit, shoreline activities, and/or work cannot be confirmed for coverage under the programmatic, the USFWS and Corps will identify information needs, and discuss procedural steps and timelines in support of individual ESA Section 7 consultation.

The Corps will prepare and submit to the USFWS an Annual Program Report. The Corps, Tacoma Power, the USFWS, and NMFS will meet annually to discuss implementation of the ESA coverage.

## **5.6 Conservation Measures**

All activities in Lake Cushman must occur in the dry when the reservoir is drawn down (i.e., below the full pool elevation of 738 ft) and the work area is above the water surface elevation. Work within the OHWM must occur when the full pool elevation is a minimum of 5 ft waterward of proposed activities (i.e., 5 ft of dry land between water and work area) (USACE 2023, p. 15).

Activities proposed below the OHWM of Lake Kokanee must occur between July 1 and October 1, or when the lake is drawn down below the work area, or as determined by the WDFW during Hydraulic Project Approval (HPA) review (USACE 2023, p. 15).

Covered activities under the programmatic (Table 1) will incorporate impact avoidance and minimization measures, including ‘construction conservation measures’ (CCMs) listed for each activity, to reduce impacts on nearshore habitat functions, for the conservation of ESA-listed species and their designated critical habitats. [Note: the CCMs include design guidelines, processes, and specifications (USACE 2023, p. 5).] General CCMs that apply to all activities are described first (below). These measures are required of each project that is eligible to use the programmatic (USACE 2023, p. 15).

All activities must comply with the following general conservation measures (USACE 2023, pp. 18-21):

### **(Construction)**

- To the extent feasible, natural vegetation will be retained, and otherwise the extent and duration of earthwork (e.g., compacting, drilling, excavation, and filling) will be minimized.

- Geotextile fabric will be laid down prior to work to collect any debris during construction and for easy removal.
- All debris will be disposed of properly at an approved disposal site.
- Construction equipment will be cleaned and regularly checked for leaks, off-site and daily, before work is begun. Any required repairs will be completed in an upland location before the equipment is used in or near the water.
- Staging areas (used for activities such as equipment storage, vehicle storage, fueling, servicing, and hazardous material storage) will be established in a location and manner that will prevent contaminants such as petroleum products, hydraulic fluid, fresh concrete, sediments, sediment-laden water, chemicals, or any other toxic or harmful materials from entering waters of the state (Washington Administrative Code, WAC, 220-660-120[3]).
- All staging areas will be in uplands and avoid effects on wetlands and lake(s).
- After construction is complete, all temporary staging, storage, or stockpile areas will be returned to their pre-project condition (e.g., stabilize the soil, revegetate the area, and fill in any depressions caused from construction equipment used in the project). Areas where vegetation has been temporarily removed must be revegetated with trees, shrubs, and grasses native to the watershed at a density similar to pre-disturbance conditions.
- The use of equipment will be confined to specific access and work corridors to protect riparian, wetland, and aquatic vegetation.
- If wet or muddy conditions exist in or near a riparian zone or wetland area, equipment that reduces ground pressure will be used whenever feasible.
- The use of pressure-treated lumber is not authorized under this consultation in any location.
- Equipment operating below the 742.0-ft contour of Lake Cushman must use environmentally acceptable lubricants composed of biodegradable base oils. These are vegetable oils, synthetic esters, and polyalkylene glycols.

#### (Timing for Activities Within the OHWM)

- At Lake Cushman, projects will not occur in-water; construction will occur in the dry when the reservoir is drawn down below the full pool elevation of 738 ft. Work within the OHWM must occur when the full pool elevation is a minimum of 5 ft waterward of proposed activities (i.e., 5 ft of dry land between water and work area).
- Activities proposed below the OHWM of Lake Kokanee will occur between July 1 and October 1, or when the lake is drawn down below the work area, or as determined by WDFW during HPA review.

#### (Concrete Work)

- All concrete will be placed in the dry at Lake Cushman above the full pool elevation as prescribed above (e.g., when the full pool elevation is a minimum of 5 ft waterward of proposed activities [i.e., 5 ft of dry land between water and work area]) using containment systems (e.g., watertight forms) and not connected to surface waters; concrete must cure a minimum of 7 days before contact with surface water. Should new concrete technology develop that has a quicker curing rate, information must be provided as part of the project submittal, and the Corps and Services will evaluate whether a shorter cure time will be no more impactful than the cure time evaluated in this programmatic.
- Water used during the placement of concrete for washdown or related operations will not be allowed to enter waterbodies. Any process water/contact water will be routed to a contained area for treatment and will be disposed of at an authorized upland location.
- No on-site concrete washout will occur.

#### (Pile Installation)

- Any piles subject to abrasion must incorporate design features to minimize contact between all of the different components of overwater structures during all reservoir elevations.
- The use of pressure-treated lumber (wrapped or unwrapped) is not authorized under this consultation in any location.
- Whenever practical, a vibratory hammer will be used for pile installation.
- In Lake Cushman, pile installation must occur in the dry during the reservoir drawdown period.
- In Lake Kokanee, to qualify for this consultation, pipe piles must be driven by hand or by a vibratory driver.
- For protection of marbled murrelets and northern spotted owls: All impact pile driving conducted under this programmatic must occur outside of the nesting seasons for marbled murrelets and northern spotted owls (March 1–September 30).
- Vibratory or impact hammer installation of piles less than or equal to 12 inches is allowed under this programmatic. However, the smallest diameter and number of piles required to construct a safe structure should be proposed, and appropriate pile-driving methods will be employed to minimize impacts to aquatic resources.

#### (Pile Removal)

- At Lake Cushman, pile removal must occur in the dry during the reservoir drawdown period.

- If a pile breaks above the surface of sediment or less than 2 ft below the surface, every feasible attempt short of excavation must be made to remove it entirely. If the pile cannot be removed without excavation, the pile should be driven deeper if possible.
- Removal of all creosote-treated wood from existing dock and shoreline stabilization structures proposed for replacement within the proposed project area and waterward of OHWM is required to be eligible for programmatic coverage.

#### (Pollution and Erosion Control)

- Site planning and site erosion control measures commensurate with the scope of the project will be used to minimize damage to natural vegetation and permeable soils and prevent erosion and sediment discharge from the project site.
- Before significant earthwork begins, appropriate temporary erosion controls will be installed downslope to prevent sediment deposition in the water body.
- (During Construction) Earthwork in the reservoir below OHWM will be completed as quickly as possible.
- (During Construction) If eroded sediment appears likely to be deposited in the reservoir during construction, additional sediment barriers should be installed as necessary.
- (During Construction) Temporary erosion control measures may include fiber wattles, silt fences, jute matting, wood fiber mulch and soil binder, or geotextiles and geosynthetic fabric.
- (During Construction) Pollution and erosion control measures will be inspected and monitored throughout the length of construction.
- (During Construction) All disturbed soils will be stabilized following any break in work unless construction will resume within 4 days.
- Temporary erosion controls will be removed after construction is complete and the site is fully stabilized.

#### (Grating Requirements for Docks and Piers)

- A dock or float 6 ft wide or narrower must have at least 30 percent of the deck surface covered in functional grating. A dock or float wider than 6 ft (up to 8 ft wide) must have at least 50 percent of the deck surface covered in functional grating. The grating material's open area must be at least 60 percent.
- Functional grating must not be covered (on the surface or underneath) with any items (e.g., kayaks, planters, sheds, lawn chairs).
- All new/replacement ramps/gangways must be 100 percent grated.

(Disturbance of Vegetation)

- Existing habitat features (e.g., vegetation, large wood) shall be retained to the extent possible to avoid causing erosion and to maintain food sources, shading, and other ecological functions important to water quality and aquatic species.
- Disturbance of bank vegetation shall be limited to a 12-ft work corridor on either side of the proposed work.
- Tree removal associated with actions covered under this programmatic is prohibited unless the applicant provides an arborist report stating that trees represent a hazard to life or property. This measure will protect trees along the shoreline and ensure that they can contribute to future large wood recruitment in the reservoirs.
- Suitable nesting habitat(s) for marbled murrelets or northern spotted owls will not be removed as part of any activities covered under this programmatic.
- Trees that must be removed should be re-installed along the nearshore as downed habitat features where possible. Any anchors for securing large wood should be buried.
- Areas where vegetation has been temporarily disturbed during staging, access, or construction must be restored to pre-disturbance conditions.
- All disturbed areas must be protected from erosion within 7 calendar days of completion of the project using vegetation or other means.

(For **Category A** – Shoreline Stabilization Measures)

This activity includes the repair, replacement, and/or maintenance of existing shoreline stabilization structures, including the use of both structural measures (e.g., concrete, steel, rock, or wood; including bulkheads, wingwalls, footings, armor, and/or foundations) and non-structural measures (e.g., natural shorelines or bioengineering, including ‘hybrid’ shoreline techniques). This programmatic requires that applicants first consider non-structural stabilization measures, and demonstrate that such alternatives are infeasible, before requesting authorization for structural shoreline stabilization measures.

The following conditions apply (USACE 2023, pp. 22-25):

- Wherever feasible, applicants should utilize living shoreline techniques to provide, maintain, or improve habitat and/or ecosystem function(s), and enhance shoreline resilience. Feasibility is determined with a geotechnical assessment as part of the Mason County shoreline permitting process, and available through the Mason County Shoreline Planner.
- The repair and replacement of structural stabilizations with non-structural measures is encouraged where possible to maintain fish habitat, hydrologic processes, and water quality and ensure no net loss of ecological function along the shoreline.

- To be eligible for programmatic coverage, applicants must remove all creosote-treated wood from existing shoreline stabilization structures proposed for full replacement within the proposed project area and waterward of OHWM.
- A licensed engineer must stamp all drawings for repair to existing shoreline stabilization measures (structural or non-structural).
- In the event that any applicant desires to replace residential shoreline stabilization or armoring, the applicant must use the least impactful technically feasible bank protection alternative for the protection of fish life.
- An applicant that desires to replace residential shoreline stabilization or armoring must conduct a site assessment to consider the least impactful alternatives. The site assessment requirement can be fulfilled with submittal of the Shoreline Geotechnical Assessment prepared for Mason County for structural stabilization per Mason County Code 17.50.340.B.2, or updates, as amended. The applicant should propose a hard armor technique only after considering site characteristics such as the threat to major improvements or other factors in an analysis of alternatives. The common alternatives are listed below in order from most preferred to least preferred:
  - ✓ Remove the existing shoreline stabilization structure and restore the shoreline.
  - ✓ Remove the existing shoreline stabilization structure and install native vegetation.
  - ✓ Remove the existing shoreline stabilization structure and replace it with a soft structure constructed of natural materials, including bioengineering.
  - ✓ Remove the existing hard structure and replace it with a hard shoreline structure at the toe of slope.
- Structural shoreline stabilization measures are prohibited in Resource Management shoreline classification areas.
- This action does not include new shoreline stabilization measures. Only repair, replacement, and/or maintenance of existing shoreline stabilization measures will be considered under this programmatic. Any expansion waterward and below the plane of the OHWM that exceeds 10 percent of the original footprint of existing shoreline stabilization structures is considered “new” and will not be covered under this programmatic unless specifically authorized by the Corps and the Services. [Allowances for additional footprint exceedances may be considered when an applicant proposes to replace an existing structural shoreline stabilization with non-structural (bioengineering) methods.] Under all circumstances, expansion beyond the existing structure footprint must be minimized. New designs must reflect the least impactful alternative per the site assessment requirements described above.
- The activity may not exceed an average of 1 cubic yard of fill per running foot, as measured along the length of the treated bank, below the plane of the OHWM. [The threshold of 1 cubic yard of fill per running foot, as defined by Corps Nationwide Permit guidance (Corps 2022), applies only to the volume of fill waterward and below the plane of the OHWM, rather than the entire volume of fill placed as part of the activity.]



Activities that do not meet this threshold but are within 10 percent of the original structure footprint below the OHWM will be considered consistent with the programmatic.

- No material may be placed in excess of the minimum needed for erosion protection:
  - ✓ Rock armoring to protect the toe of an existing shoreline stabilization structure is authorized as long as the rock placement proposed is demonstrated as the minimum quantity required to achieve long-term stability.
  - ✓ If a rock toe is not present, new rock may be placed to ensure minimal encroachment into the lakebed at the threshold of 1 cubic yard per running ft of stabilization/bulkhead described above.
- No material may be of a type, or placed in any location, or in any manner that will impair surface water flow into or out of any waters of the United States.
- No material may be placed in a manner that will be eroded by normal or expected high reservoir conditions.
- The activity must be properly maintained, which may require repair after severe storms or erosion events. As noted in Section 2.1 above, all work within the OHWM of Lake Cushman (including repairs) must occur when the reservoir is drawn down and the full pool elevation is a minimum of 5 ft waterward of proposed activities (i.e., 5 ft of dry land between water and work area).
- Large wood may be chained as part of the design.
- Coir logs, coir mats, stone, native wood debris, and other structural materials must be adequately anchored, of sufficient weight, or installed in a manner that prevents relocation in most wave action or reservoir conditions, except for extremely severe storms.
- Degradable fabric and support filters may be used but must be designed and constructed to prevent surface exposure of the material through time.
- Land-based equipment will be used to deliver materials. If the project area is inaccessible via land-based equipment due to steep slopes or dense native vegetation, material delivery by barge or boat is permitted as an alternative to limit disturbance.
- Temporary stockpiling on the exposed lakebed will be permitted only with appropriate containment and with full and expedient removal at completion of work.
- All depressions created during construction must be filled prior to inundation.
- (For Structural Shoreline Stabilization) Buried rock may be used below grade where necessary to stabilize the toe of the slope and must be covered with sand/small gravel mixes in such a way to minimize net erosion through time.

- (For Structural Shoreline Stabilization) Structural measures that utilize natural materials such as rock are preferred over structural measures that use manufactured materials such as concrete or lumber.
- (For Structural Shoreline Stabilization) Structures made of tires, rubble, petroleum-based products, railroad ties, filled barrels, brick, asphalt, solid waste, or scrap machinery are not allowed.
- (For Structural Shoreline Stabilization) Gabion baskets are not allowed.
- (For Structural Shoreline Stabilization) Adequate bank toe protection must be provided to ensure stability without relying on additional riprap.
- (For Structural Shoreline Stabilization) Construction of stabilization structures must be completed prior to any backfilling.
- (For Structural Shoreline Stabilization) All construction materials, including riprap and backfill, must be obtained from an upland source.
- (For Structural Shoreline Stabilization) Structures must be driven into the reservoir bed a depth sufficient to prevent undermining caused by erosion.
- (For Structural Shoreline Stabilization) Structures must be structurally tight to prevent seepage of backfill material.
- (For Structural Shoreline Stabilization) All nuts, bolts, nails, cables, straps, etc. used to secure and support structures must be noncorrosive (e.g., stainless steel, aluminum, galvanized steel).
- (For Structural Shoreline Stabilization) Applicants must follow guidelines from the Integrated Streambank Protection Guidelines (WDFW 2002) and WAC 220 when designing shoreline stabilization measures. The key points, amended to be applicable to this programmatic, are as follows:
  - ✓ When an existing bulkhead is being repaired, construction shall occur no farther waterward of the existing bulkhead than is necessary for construction of the new footing.
  - ✓ The replacement structure shall be designed, located, sized, and constructed to minimize effects on shoreline process and fish and wildlife habitat.
  - ✓ Replacement of a failed bulkhead shall be permitted at the toe of slope.
  - ✓ Existing bulkheads that are being replaced shall be removed unless removing the structure would cause more ecological disturbance than leaving it in place.
  - ✓ Replacement bulkheads shall not encroach any farther waterward of the OHWM than the existing structure unless a geotechnical assessment concludes that it is the only feasible way to address overriding safety or environmental concerns. In such cases, the replacement shall abut the waterward side of the existing structure.

(For Category A – Boat Ramps – Community and Public)

This activity includes the repair, replacement, or maintenance of existing community and public boat ramps comprised of poured concrete, concrete planks, and/or packed gravel.

The following conditions apply (USACE 2023, pp. 25, 26):

- This action does not include private boat ramps. Private boat ramps are a prohibited use within the Project Boundary (Tacoma Power 2014 or the most recent version thereof).
- Covered activities are limited to the in-place repair, replacement, and/or maintenance of existing community and public boat ramps. This action does not include new community or public boat ramps.
- Replacement boat ramps must occur within the same footprint or be no more than 10 percent larger than the footprint of the original structure to be considered consistent with the programmatic.
- The discharge of dredged or fill material into waters of the United States must not exceed 50 cubic yards (waterward of the OHWM) of concrete, rock, crushed stone, or gravel into forms or in the form of pre-cast concrete planks or slabs.
- Asphalt or other petroleum-based surfaces are not allowed. Bituminous concrete is not allowed as a ramp surface. Ramp surfaces may consist of gravel or clean stone; pre-cast concrete planks, panels, or slabs; or, cast-in-place concrete.
- Gravel or stone ramps must be designed to prevent the materials from eroding into the reservoir.
- Ramps containing concrete must be sufficiently cured to prevent leaching prior to contact with water.

(For Category A – Dock - Single-Family, Shared, and Community)

A single-family dock is used by a single lessee. A shared dock is defined as a non-commercial shoreline structure associated with three or more shoreline-adjacent, single-family residences/lessees. A community dock is defined as a dock that provides moorage for pleasure craft and/or accommodates recreational activities for use in common by residents of a subdivision or community.

This activity includes the repair, replacement, or maintenance of single-family, shared, and community docks and piers, including piling installation. This activity also includes actions required to replace existing single-family, shared, and community dock structures, including the removal of existing structures.

The following conditions apply (USACE 2023, pp. 26-28):

- This action does not include the construction of new single-family, shared, or community dock structures. Eligibility for new shared dock structures is discussed in Section 2.3.1.

New single-family and community dock structures are not eligible for coverage under this programmatic.

- Because single-family, shared, and community docks are prohibited in Resource Management shoreline classification areas, repair and replacement of such structures in this shoreline classification are also prohibited.
- To avoid and minimized impacts to listed species, open-celled, beadboard-type polystyrene is not an approved flotation material for docks. Non-foam flotation systems may be used; however, structures cannot be covered with metal. Injected drum flotation is not allowed for docks.
- Repaired and replacement single-family structures can have no more than 300 square ft of total overwater coverage. [Overwater coverage refers only to portions of structures at or below the full pool elevation of 738 ft at Lake Cushman.] If the existing single-family structure has more than 300 square ft of total overwater coverage, the size of the repaired or replacement structure must be reduced to no more than 300 square ft of total overwater coverage to be eligible for coverage under this programmatic.
- For the purposes of this consultation, repaired and replacement shared dock structures can have no more than 300 square ft of total overwater coverage.
- To be eligible for programmatic coverage, applicants must remove all creosote-treated wood from existing docks proposed for full replacement within the proposed project area and waterward of OHWM.
- Float cradles may be repaired or replaced as part of this activity, if included as part of the existing structure design.
- Repaired and replacement single-family and shared dock structures may include the addition of new floats as long as the total overwater coverage of the entire structure (including the float) does not exceed 300 square ft. The entire structure (including the float) must abide by the restrictions and CCMs described herein and may not introduce new effects on ESA-listed species and their habitat beyond those considered in this programmatic.
- All synthetic flotation material associated with the replaced dock must be permanently encapsulated to prevent breakup into small pieces and dispersal in water.
- The width of each replacement ramp shall not exceed 5 ft and the width of each pier, not including the pilings, shall not exceed 6 ft. Additionally, the width of each replacement float shall not exceed 8 ft.
- Docks must extend at least 12 inches above the water surface at all times, but no more than 5 ft at full reservoir elevation.
- Replacement float design must incorporate stop blocks to prevent them from grounding when the reservoir is drawn down.
- A dock anchorage system is required to secure mooring of the replacement structure. Anchorage systems utilizing a 'deadman' (i.e., an anchor buried on shore) or ground

stakes must be installed flush with the existing grade. Anchor cables may not be attached to trees, stumps, power poles, guardrail posts, or similar items.

- Ground stakes or other shore-side anchoring must be countersunk into the grade. Countersinking accommodates shoreline erosion and extends the period of time that anchors are covered.
- Removal of shoreline and aquatic vegetation must be limited to that necessary to gain access to construct the shoreline use.
- Tree removal to repair or replace docks is not authorized.
- Replacement floating dock structures must be built so that they can adapt to changes in reservoir elevation.

(For Category A – Stairways, Steps, Walkways, and Paths)

This activity includes the repair or replacement of existing stairways, steps, walkways, and paths. Repair or replacement of stairways, steps, walkways, and paths above the OHWM does not typically require a discharge authorization from the Corps. This activity is included in the programmatic to consider the effects of the action on ESA-listed species when the activity accompanies an action that requires a Corps permit under Section 404 of the CWA.

The following conditions apply (USACE 2023, pp. 28, 29):

- This activity does not include new stairways, walkways, and paths.
- Stairways and walkways are prohibited in Resource Management shoreline classification areas.
- For portions of replacement stairways, walkways, and paths located below the OHWM, activities must occur within the same footprint as the original structure to be considered consistent with the programmatic.
- The path should be the minimum width necessary to accommodate shoreline access and shall not exceed 4 ft in width in the Shoreline A and B Classifications and shall not exceed 3 ft in width in the Resource Management Classification.
- Path surfaces should consist of natural materials such as grass, wood chips, or gravel/crushed rock, and placement of such must not involve earth moving or soil disturbance.
- Materials used for the maintenance, repair, or replacement of stairways and walkways should consist of metal, dry laid stone, wood, or wood with loose stone, gravel, or wood chips.
- Paths may extend from the common boundary between the Project Boundary (742 ft elevation for Lake Cushman and 482 ft at Lake Kokanee) and the adjacent lot to the full pool elevation (738 ft elevation at Lake Cushman and 478 ft elevation at Lake Kokanee).
- Stairways below OHWM must be open-frame construction and not solid structures (i.e., concrete).

(For Category A – Temporary Use, Temporary Access)

This activity includes temporary uses that require a CWA Section 404 permit (e.g., placement or use of materials to access a site, e.g., bulk bags, sandbags).

The following conditions apply (USACE 2023, p. 29):

- Temporary materials may be used only when the reservoir is drawn down and may be placed only in the dry.
- Temporary devices and structures may remain in place for no longer than 60 days.
- Following completion of construction, temporary materials must be entirely removed to an upland area.
- Affected areas must be restored to pre-construction elevations and must be revegetated with native species if vegetation was removed for the placement of temporary materials.

(For **Category B** – Dock – Shared)

This program of ESA coverage includes some new or ancillary structures. “New” structures are placed or installed where there were previously none. These activities are broadly grouped into Category B.

This activity includes the construction of new, shared docks for three or more shoreline adjacent lessees, when at least one single-family dock structure is removed as part of the action. A shared dock provides non-commercial moorage for pleasure craft and/or accommodates recreational activities for use in common by shoreline-adjacent lessees.

The following conditions apply (USACE 2023, pp. 30, 31):

- This action does not cover the construction of new single-family, public, or community dock structures. New single-family, public, and community dock structures are not eligible for coverage under this programmatic.
- Under this programmatic, a new shared dock is authorized only when the activity will result in the removal of at least one single-family dock structure abutting a leased development lot by one of the applicants proposing to construct the new shared dock. This activity covers work below the OHWM to remove existing single-family dock structures as required to qualify for programmatic coverage.
- New shared docks can have no more than 300 square ft of total overwater coverage to be eligible for coverage under this programmatic.
- To qualify for coverage under this consultation, new shared dock structures must be constructed for use by three or more lessees. No other dock will be permitted within the shoreline boundaries of the properties associated with the shared dock.

- To be eligible for programmatic coverage, applicants must remove all creosote-treated wood from existing docks proposed for removal within the proposed project area and waterward of OHWM.
- Shared dock structures are prohibited in Resource Management shoreline classification areas.
- The following design features and uses for new dock structures are prohibited:
  - ✓ Elevated decks and roofs on docks and moorings.
  - ✓ Enclosed boat docks (boat houses) and moorings (with sides).
  - ✓ Habitation of structures on docks.
  - ✓ Fueling stations on docks.
  - ✓ Bathrooms and outhouses on docks.
  - ✓ Fish-cleaning stations on docks.
  - ✓ Skirting around docks.
- The width of ramps shall not exceed 5 ft, and the width of piers, not including the pilings, shall not exceed 6 ft. Additionally, the width of floats shall not exceed 8 ft.
- Docks must extend at least 12 inches above the water surface at all times but no more than 5 ft at full reservoir elevation.
- Docks must be placed as close to the shoreline as possible and may not extend more than 50 ft waterward from the OHWM of the reservoir. The 50 ft includes any gangway or ramp to access a floating dock.
- Float design must incorporate stop blocks to prevent them from grounding if the reservoir is drawn down.
- Ground stakes or other shore-side anchoring must be countersunk into the grade. Countersinking accommodates shoreline erosion and extends the period of time that anchors are covered.
- Removal of shoreline and aquatic vegetation must be limited to that necessary to gain access to construct the shoreline use. Tree removal to repair or replace docks is not authorized.
- Floating dock structures must be built so that they can adapt to changes in reservoir elevation. Docks and moorings must be constructed perpendicular to the shoreline.
- A dock anchorage system is required to secure mooring of the structure. Anchorage systems utilizing a 'deadman' or ground stakes must be installed flush with the existing grade. Anchor cables may not be attached to trees, stumps, power poles, guardrail posts, or similar items.

(For Category B – Mooring Buoys, Swimming Floats)

Floats (or rafts) are moored, anchored, or otherwise secured, but not directly connected to the shoreline. A mooring buoy is a structure floating on the surface of the water that is used for

private vessel moorage. This activity does not typically require a discharge authorization from the Corps. This activity is included in the programmatic to consider the effects of the action on ESA-listed species when the activity accompanies an action that requires a Corps permit under Section 404 of the CWA.

The following conditions apply (USACE 2023, pp. 31, 32):

- Mooring buoys and swimming floats are prohibited in Resource Management shoreline classification areas.
- To prevent the structure from grounding out on substrate during low reservoir conditions, mooring buoys must be removed and the line tied to shore during reservoir drawdown.
- Floating structures must remain at least 12 inches above the substrate at all times, using stoppers/pin piles/feet.
- Float width must not exceed 8 ft, and the length must not exceed 30 ft. [Note: A dock or float 6 ft wide or narrower must have at least 30 percent of the deck surface covered in functional grating. A dock or float wider than 6 ft (up to 8 ft wide) must have at least 50 percent of the deck surface covered in functional grating. The grating material's open area must be at least 60 percent.]
- Only one mooring buoy per property is authorized by this programmatic.
- (For Mooring Buoys) Use of a retrievable anchor rather than mooring buoys is recommended to moor boats offshore temporarily (i.e., no more than 14 days).
- (For Mooring Buoys) Anchors should be helical screw or another type of embedded anchor. An alternative anchor (i.e., concrete block) may be used only if the substrate prohibits use of embedded anchors.
- (For Mooring Buoys) If an embedded anchor cannot be used and a concrete anchor is needed, calculations showing that the anchor will hold without dragging/breaking during storm events are required. This analysis should include the size of the vessel and the dry weight/dimensions of the anchor.
- (For Swimming Floats) Swimming floats may be held in place with lines anchored with a helical screw or 'duckbill' embedded anchor, piles with stoppers, and/or float support/stub piles.
- (For Swimming Floats) A maximum of four piles (not including stub piles) or embedded anchors may be installed.
- (For Swimming Floats) If a concrete anchor is needed to hold the float, calculations showing that it will hold without dragging or breaking during storm events are required. This analysis should include the size of the float and the dry weight and dimensions of the anchor.

(For Category B – Lighting)

This activity includes the installation and use of permanent lighting associated with other activities (e.g., repair or replacement of docks or piers). This activity does not typically require a



discharge authorization from the Corps. This activity is included in the programmatic to consider the effects of the action on ESA-listed species when the activity accompanies an action that requires a Corps permit under Section 404 of the CWA.

The following conditions apply (USACE 2023, pp. 32, 33):

- Permanent lighting is prohibited in Resource Management shoreline classification areas.
- No electrical below the 742-ft elevation contour or within the reservoir is permitted.
- Artificial lighting should be minimized to the extent possible. If lighting is proposed, it should be included on the project drawings and will be included in the review process.
- All permanent lighting associated with actions authorized in this programmatic must be directed at the dock.
- Motion-sensor lighting is required.
- Solar lighting should be used whenever feasible.

(For **Category C** – Removal of Derelict Structures)

Should the applicant propose (or the USFWS require) habitat improvement, Category C includes potential options. These habitat improvements do not typically require a discharge authorization from the Corps (i.e., unless fill material is placed). The following actions are included in the programmatic to consider the effects of the action on ESA-listed species when the activity is an effect of an action that requires a Corps permit under Section 404 of the CWA.

This activity includes the removal of derelict, debris or structures from shorelines waterward of the parcel. Examples of debris that could be removed include derelict vessels, bank protection and shore armoring, decks, metal debris, sunken boats, sheds, lawn furniture, containers, piers, abandoned concrete (including anchors and encased pile footings), abandoned building materials, concrete, tires, ramps, and similar structures or materials.

The following conditions apply (USACE 2023, pp. 33, 34):

- This activity does not include the removal of natural wood. Natural sources of wood should be retained.
- Debris removal must occur between the applicant's extended side lot lines to a distance of 50 ft from OHWM; the applicant cannot remove debris from lots or open water areas outside of their extended leased lot lines.
- All debris removal done at or below the OHWM must be done in a manner that is the least substrate-disruptive practicable method for the debris type. For example, the use of a barge mounted or land-based crane working in the dry to remove derelict piles is acceptable. The careful use of a clamshell-type bucket to grab and lift debris may be acceptable if it would not dig into the substrate or break up the debris. However, land-based machinery cannot be operated from positions at or below the existing water line at the time of the work.

- All debris must be staged and transported to appropriate upland disposal facilities in a manner that prevents fine sediments and other deleterious materials from reentering the reservoirs.
- When derelict material is removed, equipment should be stationed on the bank.
- Removed material should not be dragged.
- Material should be dismantled in place using hand tools and manual labor or land-based equipment and taken to a licensed upland disposal site.
- Following removal of derelict material, the applicant must fill and smooth over any depressions created in the bed with material that has the same composition as native material. Fill material must be sloped towards the bank at a slope similar to the prevailing condition.
- Derelict structures that extend below the OHWM (e.g., docks, floats, piling, or piers) should generally be removed using hand tools and manual labor. As noted in Section 2.1 above, all work within the OHWM of Lake Cushman must occur when the reservoir is drawn down and the full pool elevation is a minimum of 5 ft waterward of proposed activities (i.e., 5 ft of dry land between water and work area).
- Shoreline structures and debris such as derelict boat ramps, bank protection, shore armoring, creosote-treated logs or timbers, derelict buildings, or other material should generally be removed using hand tools and manual labor or land-based equipment and taken to an upland disposal site.
- For derelict vessel removal, all toxic materials such as fuel and oil must be removed from the vessel before it is towed or removed.
- Creosote-treated timbers and materials containing asbestos must be disposed of at an approved facility.

(For Category C – Use of Encapsulated Floatation Devices)

This activity involves the encapsulation of non-encapsulated floatation devices, or the removal and replacement of non-encapsulated floats with new encapsulated floats, when not associated with a single-family, shared, or community dock replacement. This activity applies to floats below the OHWM within 50 ft of the lessee's lot line.

(For Category C – Removal of Treated Wood Pilings)

When creosote pile removal is not otherwise required, this activity involves the removal of creosote-treated wood at or below the OHWM and within 50 ft of the lessee's lot line (i.e., derelict piles and/or other creosote-treated wood debris). Creosote-treated piling must be pulled-out or cut off 2 ft below the mudline, and covered with clean material.

(For Category C – Reduction in Size of Overwater Structures)

For activities that involve the repair, replacement, maintenance, and/or consolidation of existing overwater structures, this option involves an overall reduction in size of overwater structures (i.e., compared to existing conditions).

(For Category C – Replacement of Solid Decking with Grated Decking)

For activities that do not otherwise require grated decking, this option involves the replacement of existing solid decking with at least 30 percent grated decking to increase light penetration.

(For Category C – Bioengineered Large Wood Installation)

This activity involves the installation of large wood in the nearshore to promote aquatic habitat complexity and shoreline function.

The following conditions apply (USACE 2023, p. 35):

- Large wood must be installed below the OHWM and within the lessee's lot lines.
- Large wood must be adequately anchored or installed in a manner that prevents relocation in most wave action or reservoir conditions except for extremely severe storms. Any anchors used for securing large wood should be buried.
- Large wood installations must be designed by a licensed engineer and in accordance with the WDFW Integrated Streambank Protection Guidelines (WDFW 2002).

## **5.7 Action Area**

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment.

The proposed federal action includes implementation of a program of ESA coverage for specific shoreline activities (Covered Activities), that are proposed within or accompanying a Corps CWA permit application, on Lake Cushman and/or Lake Kokanee. Lake Cushman and Lake Kokanee are flow-regulated reservoirs, located on the NF Skokomish River above the Cushman Dams. At Lake Cushman and Lake Kokanee, the Corps' CWA jurisdictional boundary is the OHWM (USACE 2023, p. 2). And, "Local shoreline permitting generally follows the 738.0-ft contour around ... Lake Cushman ... and the 478.0-ft contour around Lake Kokanee" (USACE 2023, p. 6).

Figure 1 depicts Lakes Cushman and Kokanee, shoreline designations, the surrounding landscape, and action area. The aquatic component of the action area for this proposed federal action includes the full extent of the reservoirs and extends upslope to a distance of approximately twice the site potential tree stand height. The terrestrial component of the action

area extends to adjacent private, leased, Cushman Hydroelectric Project, and National Forest lands.

Covered activities will affect and/or influence shoreline, riparian, and aquatic habitat conditions throughout Lakes Cushman and Kokanee, and on long temporal timelines (i.e., for the functional life of new, repaired, replaced, and maintained shoreline structures and features). Effects in the uplands will be limited to temporary staging and access, and construction areas and footprints along the jurisdictional shorelines. Temporary sources of elevated sound and visual disturbance will also extend into the uplands, to distances of 0.5-mile to 1.0-mile (USACE 2023, pp. 37-40).

## **6 ANALYTICAL FRAMEWORK FOR THE JEOPARDY AND ADVERSE MODIFICATION DETERMINATIONS**

### **6.1 Jeopardy Determination**

The following analysis relies on four components:

- (1) The *Status of the Species*, which evaluates the rangewide condition of the listed species, relative to its reproduction, numbers, and distribution, the factors responsible for that condition, and the species' survival and recovery needs; and explains if the species' current rangewide population is likely to persist while retaining the potential for recovery;
- (2) The *Environmental Baseline*, which evaluates the condition of the species in the action area, relative to its reproduction, numbers, and distribution, absent the direct and indirect effects of the proposed action, the factors responsible for that condition, and the importance of the action area to the survival and recovery of the species;
- (3) The *Effects of the Action*, which determines the direct and indirect impacts of the proposed federal action, and the effects of any interrelated or interdependent activities on the species, and how those impacts are likely to influence the survival and recovery role of the action area for the species; and
- (4) *Cumulative Effects*, which evaluates the effects of future, non-federal activities reasonably certain to occur in the action area.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed federal action, in the context of the species' current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the listed species in the wild.

The jeopardy analysis in this Opinion emphasizes the rangewide survival and recovery needs of the listed species, and the role of the action area in providing for those needs. It is within this context that we evaluate the significance of the proposed federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

## 6.2 Destruction or Adverse Modification Determination

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to destroy or to adversely modify designated critical habitat. A final rule revising the regulatory definition of “destruction or adverse modification of critical habitat” was published at 50 CFR 402.02 on February 11, 2016 (81 FR 7214). The final rule became effective on March 14, 2016. The revised definition states: “Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of the listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of the species or that preclude or significantly delay development of such features.”

Designations of critical habitat prior to February 11, 2016, used the terms “primary constituent elements” (PCEs), “physical or biological features” (PBFs), or “essential features” to characterize the key components of critical habitat that provide for the conservation of the listed species. The 2016 critical habitat regulations (81 FR 7414) discontinue use of the terms “PCEs” or “essential features,” and rely exclusively on use of the term “PBFs” for that purpose, because that term is contained in the statute. However, this shift in terminology does not change the approach used in conducting our destruction or adverse modification analyses, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. For those reasons, in this Opinion PCEs or essential features should be viewed as synonymous with PBFs. All of these terms characterize the key components of designated critical habitat that provide for the conservation of the listed species.

Our destruction or adverse modification analyses and determination(s) rely on the following four components:

- (1) The *Status of Critical Habitat*, which evaluates the rangewide condition of designated critical habitat for the listed species, in terms of essential features, PCEs, or PBFs (depending on which of these terms was relied upon in the designation), the factors responsible for that condition, and the intended overall recovery function of the critical habitat;
- (2) The *Environmental Baseline*, which evaluates the current condition of designated critical habitat in the action area, absent the direct and indirect effects of the proposed action, the factors responsible for that condition, and the recovery role of the critical habitat in the action area;
- (3) The *Effects of the Action*, which determines the direct and indirect impacts of the proposed federal action, and the effects of any interrelated or interdependent activities, on the essential features, PCEs, or PBFs, and how those effects are likely to influence the recovery role of affected critical habitat units; and
- (4) *Cumulative Effects*, which evaluates the effects of future, non-federal activities in the action area, on the essential features, PCEs, or PBFs, and how those effects are likely to influence the recovery role of affected critical habitat units.

For purposes of making the destruction or adverse modification finding, the effects of the proposed federal action, together with any cumulative effects, are evaluated to determine if the critical habitat rangewide will remain functional (or retain the current ability for the PBFs to be functionally re-established in areas of currently unsuitable but capable habitat) to serve its intended conservation and recovery role for the listed species.

## **7 STATUS OF DESIGNATED CRITICAL HABITAT: Bull Trout**

For a detailed account of the status of designated bull trout critical habitat, refer to Appendix B: Status of Designated Critical Habitat: Bull Trout.

## **8 ENVIRONMENTAL BASELINE: Designated Bull Trout Critical Habitat**

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed federal projects in the action area that have undergone section 7 consultation, and the impacts of state and private actions which are contemporaneous with the consultation in progress.

### **8.1 Current Condition of Designated Critical Habitat in the Action Area**

#### **8.1.1 Factors Responsible for the Condition of Designated Critical Habitat**

On October 18, 2010, the USFWS issued a final, revised critical habitat designation for the bull trout (70 FR 63898). The designation includes 32 critical habitat units in six Recovery Units, located throughout the coterminous range of the bull trout in Washington, Oregon, Idaho, Montana, and Nevada. The Coastal Recovery Unit includes all areas west of the Cascade Mountains in Washington, including the Puget Sound's major tributaries, tributaries to the Strait of Juan de Fuca, and coastal rivers that support local bull trout populations. Lake Cushman and Lake Kokanee are designated as bull trout critical habitat (Figure 5).



Figure 5 Designated bull trout critical habitat (SF/NF Skokomish R., Hood Canal).

Habitat connectivity has been interrupted and fish passage blocked by the two Cushman Dams since the 1920s. However, as part of the FERC relicensing effort that concluded in 2010, Tacoma Power installed fish passage infrastructure which became operational in 2016. The effectiveness of the fish passage facilities and their use by bull trout is being actively evaluated by Tacoma Power.

According to the Corps and sources cited by the Corps (USACE 2023, p. 42):

“The existing aquatic environment [in Lake Cushman] ... is degraded by a host of anthropogenic changes. Developed portions of the reservoirs have resulted in the construction of numerous public and private residential structures including piers, ramps, floats, and shoreline armoring (e.g., bulkheads) that have modified natural habitat conditions and degraded nearshore habitat quality and function. The Cushman No. 1 and

No. 2 Dams and associated structures have also modified aquatic habitat and inhibited anadromous fish migration. Water levels in Lake Cushman can fluctuate up to 21 meters (69 ft) and periodically inundate up to 30 acres of land surrounding the inlet to the reservoir. As a result of fluctuating water levels exposing much of the shoreline during winter months, there is little to no aquatic vegetation along the shoreline, and the lakebeds of the reservoirs are generally steep and severely scoured. Therefore, the existing function of aquatic habitat in the action area is impaired (NMFS 2021) ... Minimal residential development has occurred along the western shore of Lake Cushman, due largely to the inaccessibility of the area (FERC 1996). These minimally developed shorelines are generally part of the Resource Management [shoreline] classification”.

Designated critical habitat for the bull trout is comprised of nine PCEs. These PCEs describe habitat components or features that are critical to the primary biological needs of bull trout, which include: foraging, sheltering, reproduction, rearing of young, dispersal, and genetic exchange. The baseline conditions for each PCE in the action area are described below:

1. *Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity, and provide thermal refugia.*

“Significant seasonal fluctuations of water levels have reduced habitat complexity in the reservoir and connectivity with ... seeps and springs” (USACE 2023, p. 54). “The action area is modified by existing shoreline development and experiences significant seasonal fluctuations of water levels as a result of ... dam [operations]” (USACE 2023, p. 71). Dam operations significantly and pervasively alter the current function of PCE #1.

Within the action area, the current function of PCE #1 is *moderately* impaired and degraded.

2. *Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.*

“Migratory [habitats] in the action area [have] been degraded by piers, ramps, and floats constructed along the shoreline, and a loss of shoreline complexity resulting from residential and recreational development, bank armoring, and roads. Reduced habitat complexity has further resulted from operation of the dams, which results in significant seasonal fluctuations of water levels” (USACE 2023, p. 54). A floating surface collector is operated by Tacoma Power in Lake Cushman (USACE 2023, p. 41), but downstream passage (and upstream passage) conditions and functions around the dams are impaired.

Within the action area, the current function of PCE #2 is *severely* impaired and degraded.

3. *An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.*

Lake Cushman provides core FMO habitat for subadult and adult bull trout and supports prey species and abundant prey production that bull trout rely on throughout the middle and upper NF



Skokomish River basin. Lake Cushman and the upper NF Skokomish River basin support populations of Chinook salmon (*Oncorhynchus tshawytscha*), mountain whitefish (*Prosopium williamsoni*), cutthroat trout (*O. clarkii*), rainbow trout (*O. mykiss*), kokanee (*O. nerka*), longnose sucker (*Catostomus catostomus*), sculpin (*Cottus* spp.), speckled dace (*Rhinichthys osculus*), and non-native largemouth bass (*Micropterus salmoides*) (Brenkman et al. 2017 in USACE 2023, p. 41). Rainbow and cutthroat trout are considered the dominant species in Lake Cushman (Tacoma Power 2012 in USACE 2023, p. 41). Downstream of the dams, anadromous salmonids that currently or historically use the river include early returning (spring or summer) and late-returning (fall) runs of Chinook salmon, fall coho salmon (*O. kisutch*), summer and winter steelhead (*O. mykiss*), chum salmon (*O. keta*), sockeye salmon (*O. nerka*), pink salmon (*O. gorbuscha*), and sea-run cutthroat trout (Brenkman et al. 2017 in USACE 2023, p. 41).

According to the Corps and sources cited by the Corps (USACE 2023, p. 41):

“As part of the federal license to operate the dams, Tacoma Power has invested in two hatcheries. The Saltwater Park Sockeye Hatchery, located on Hood Canal, is dedicated to rearing sockeye salmon for release into Lake Cushman. The NF Skokomish Salmon Hatchery is located next to Lake Kokanee and is dedicated to rearing spring Chinook salmon, winter-run steelhead, and coho salmon for release into the NF Skokomish River below the Cushman No. 2 Dam. Tacoma Power also annually releases rainbow trout into Lake Kokanee and other lakes in Mason, Kitsap, Thurston, Pierce, and Jefferson counties (Tacoma Power 2021). A fish collection facility at the NF Powerhouse has been operational since February 2013 and captures returning adults at the base of Cushman Dam No. 2 prior to release into Lake Cushman or retention for broodstock. In 2015, a floating surface collector was installed by Tacoma Power in Lake Cushman to trap salmonids and assist in downstream juvenile migration”.

Within the action area, the current function of PCE #3 is *mildly* impaired and degraded. Lake Cushman supports prey species and abundant prey production that bull trout rely on throughout the middle and upper NF Skokomish River basin. The prey base does not appear to be limiting for bull trout.

*4. Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.*

“The shoreline is degraded by armoring and adjacent residential and recreational development, particularly in Shoreline Classifications A and B” (USACE 2023, p. 54). “Habitat complexity ... is reduced from existing development along the shoreline, which has degraded [the] nearshore ... Recruitment of large wood, sediment inputs, and established riparian vegetation is reduced or eliminated by shoreline development and the large fluctuations in water levels. Shoreline conditions are also degraded by bulkheads, docks, roads, and residences. Shoreline armoring reduces the input of sediments and results in coarsening of the substrate, increased scour of shoreline areas, and steepening of the shoreline gradient, all of which have decreased the complexity of nearshore habitat. The complexity of the shoreline aquatic environment, the

processes that establish and maintain them, and the functions they provide are impaired (USFWS 2019b)” (USACE 2023, p. 55). “Bank armoring and other land use practices ... [have reduced] the amount of functioning riparian vegetation, [interrupted] natural erosion processes that create beaches, and [prevented] the development and recruitment of large wood. Additionally, bank armoring has steepened and hardened beach profiles and simplified shoreline habitat, which reduces habitat for prey (USFWS 2019b)” (USACE 2023, p. 55)

Within the action area, the current function of PCE #4 is *moderately to severely* impaired and degraded, especially for shorelines and nearshore habitats located in Shoreline Classifications A and B. Shorelines designated Resource Management are managed by Tacoma Power for specific resource objectives (e.g., protection of water quality; habitat conservation) and these shorelines and nearshore habitats retain substantially better current function(s).

*5. Water temperatures ranging from 2 °C to 15 °C (36 °F to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.*

“Water temperatures ... are monitored [under] the Lake Cushman Dam Relicensing Agreement. Since 1990, when instream flow returned to the 30-cfs level, temperatures in the lower NF Skokomish River [have] approached natural seasonal patterns observed upstream of the dam at Staircase Ranger Station (FERC 1996). Lake Cushman exhibits distinct temperature stratification during summer months; water column temperatures range from 6 degrees C near lake bottom, to 18 degrees C on the lake surface. Mixing begins during fall when surface temperatures cool and deepwater temperatures warm. The lake is well-mixed by December, and the temperature is [approximately] 5 degrees C throughout the water column (Brenkman et al. 2017; FERC 1996; USFWS 2019b). Based on these conditions, [the PCE] is properly functioning. Large volumes of cold water are available in deeper [portions] of the reservoir in summer” (USACE 2023, p. 55).

Within the action area, the current function of PCE #5 is *not impaired* or degraded.

*6. In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.*

The action area does not include bull trout spawning or early rearing habitats. This PCE, and its functions, are absent.

*7. A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.*

“Water levels in Lake Cushman are regulated primarily by the dam, but rain and snowmelt can affect the short-term water levels (USFWS 2019b) ... [With] their Final Environmental Impact Statement (FERC 1996), Tacoma Utilities proposed [to regulate and moderate] lake level fluctuations ... Maintaining the lake level at 738 ft ... from Memorial Day [thru] Labor Day is intended to preserve submerged shoreline [functions] during the growing season (FERC 1996; USFWS 2019b)” (USACE 2023, p. 56). Dam operations significantly and pervasively alter the current function of PCE #7.

Within the action area, the current function of PCE #7 is *moderately* impaired and degraded.

*8. Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.*

“Lake Cushman was included on the Washington 2018 Water Quality 303(d) list of impaired waterbodies due to elevated quantities of methyl mercury observed in tissue samples (Ecology 2018). [Also], adjacent residences and recreational facilities [use] septic systems, which may release concentrations of nutrients [and bacteria] into the lake during the high-use season. However, it appears that water quality in the lake has improved and is functioning [so as to] not inhibit normal bull trout growth and [reproduction] (USFWS 2019b)” (USACE 2023, p. 56).

Within the action area, the current function of PCE #8 is *mildly* impaired and degraded.

*9. Sufficiently low levels of occurrence of non-native predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.*

“There are several species of non-native or introduced fish in Lake Cushman and the [NF Skokomish River] upstream of the reservoir, including a resident kokanee population that was supplemented by periodic stocking from 1936 through 1983. Lake Cushman also supports a sparse largemouth bass population (Brenkman et al. 2017; FERC 1996)” (USACE 2023, p. 56). Within the action area, non-native and introduced fish species, represent both an exploitable prey base for bull trout, and may compete with (or rarely prey upon) bull trout.

Within the action area, the current function of PCE #9 is *mildly* impaired and degraded.

## **8.2 Conservation Role of the Action Area**

The NF Skokomish River local bull trout population is mostly or entirely isolated upstream of Cushman Dam No. 1. Lake Cushman provides core FMO habitat for subadult and adult bull trout, and supports prey species and abundant prey production that bull trout rely on throughout the middle and upper NF Skokomish River basin. The action area does not provide suitable spawning or early rearing habitat for bull trout; suitable spawning and early rearing habitats are located upstream in the NF Skokomish River and its tributaries.

The Skokomish River is the only Hood Canal basin that supports local bull trout populations, spawning, and early rearing. While anadromous bull trout were and are believed to occur in the basin, bull trout exhibiting anadromous life histories are uncommon in the basin today. The Coastal Recovery Unit supports the only anadromous bull trout populations found in the lower 48 states.

Lake Cushman does not support bull trout spawning or juvenile rearing, but does provide important habitat and prey production, and is essential to the long-term health, growth, and survival of the adfluvial Skokomish River bull trout population. Furthermore, habitats and prey production provided by Lake Cushman are essential to maintenance of existing bull trout distribution and abundance in the Skokomish River bull trout core area as a whole.

The Cushman Dams prevent full expression of the anadromous life history form in the Skokomish River bull trout core area. Restoration of full and unimpeded upstream and downstream passage at the Cushman Dams would be required for full expression of the migratory life history forms and for the best possible connectivity between Skokomish River bull trout populations.

### **8.3 Climate Change**

Consistent with the USFWS's policy, our analyses under the ESA include consideration of ongoing and projected changes in climate. The term "climate" refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2014a). The term "climate change" thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2014a). Various types of changes in climate can have direct or indirect effects on species and critical habitat. These effects may be positive, neutral, or negative, and they may change over time. The nature of the effect depends on the species' life history, the magnitude and speed of climate change, and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2014b). In our analyses, we use our expert judgment to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change and its effects on species and their critical habitat. We focus in particular on how climate change affects the capability of species to successfully complete their life cycles, and the capability of critical habitat to support that outcome.

Bull trout are vulnerable to the effects of warming climates and changing precipitation and hydrologic regimes. Climate change in the Pacific Northwest will include rising air temperatures, changes in the timing and volume of streamflow, increases in extreme precipitation events, and other changes that are likely to degrade bull trout habitat and increase competition with non-native warmwater fish (Mote et al. 2014). The USFWS's 2015 Bull Trout Recovery Plan summarizes our current knowledge of potential future climate change scenarios, and their significance for bull trout recovery (USFWS 2015a).

Over a period of decades, climate change may directly threaten the integrity of all PCEs of designated bull trout critical habitat. Protecting bull trout strongholds and cold-water refugia from disturbance, and ensuring connectivity among populations, should be important considerations in addressing potential impacts of this project. Additionally, climate change may exacerbate habitat degradation impacts both physically (e.g., decreased base flows, increased water temperatures) and biologically (e.g., increased competition with non-native fishes).

Projected changes in climate may be expected to result in several impacts to bull trout and designated bull trout critical habitat, including contraction of the range of bull trout; variable or elevated stream temperatures that reduce survival and reproduction; altered ground water exchange that limits egg development; and varied geomorphology that reduces presence or quality of spawning habitat (USFWS 2015a). In addition, increased or variable flows from extreme precipitation events, rain on snow and longer dry periods may increase scouring of spawning areas, reduce juvenile rearing capacity of habitat, and inhibit movements during summer low flow conditions. Increased frequency and extended periods of wildfires may also result in loss and fragmentation of habitat (USFWS 2015a).

There is still uncertainty associated with predictions relative to the timing, location, and magnitude of future climate change. It is also likely that the intensity of effects will vary by region (ISAB 2007). For example, several studies indicate that climate change has the potential to impact ecosystems in nearly all streams throughout the Washington (Battin et al. 2007; Isaak et al. 2015; ISAB 2007; Rieman et al. 2007). In streams and rivers with temperatures approaching or at the upper tolerance limits for bull trout, it is unlikely that bull trout will be able to adapt to or avoid the effects of climate change and warming without connectivity to cooler waters. As bull trout range and/or distribution contracts, patch size (i.e., contiguous catchment area of suitable spawning and rearing habitat) decreases and connectivity is truncated. Bull trout populations that may be currently connected will likely face increasing isolation (Dunham 2015; Rieman et al. 2007). Due to variations in landform and geographic location across the range of the bull trout, it appears that some populations face higher risks than others. Bull trout in areas with currently elevated water temperatures and/or at the southern edge of its range may already be at risk of adverse impacts from current as well as future climate change.

## **9 EFFECTS OF THE ACTION: Designated Bull Trout Critical Habitat**

The effects of the action refers to the direct and indirect effects of the action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and later in time, but still reasonably certain to occur.

The proposed federal action includes implementation of a program of ESA coverage for specific shoreline activities (covered activities), that are proposed within or accompanying a Corps CWA permit application, on Lake Cushman and/or Lake Kokanee. Table 1 provides a summary of the covered activities (see Description of the Proposed Action).

Covered activities will incorporate specific avoidance and minimization measures (including design guidelines, design criteria, required procedures, and specifications), to reduce impacts on aquatic (shoreline and nearshore) habitat functions, for the conservation of ESA-listed species and designated critical habitat(s). Additional specific shoreline activities are excluded from programmatic ESA coverage (see Description of the Proposed Action), including new single-family docks, new single-family piers, and new structural shoreline stabilization measures.

The proposed federal action, and its interrelated and interdependent actions, will have both limited adverse effects and limited beneficial effects, to shoreline and nearshore habitat functions in the action area (Lakes Cushman and Kokanee), and to the current function(s) of designated bull trout critical habitat. We expect that unavoidable impacts and effects to the PCEs, will be limited but adverse in some instances, when assessed at the scale of individual project(s) and applicant(s) or lessee(s). We also expect that full and successful implementation of the program of ESA coverage and required avoidance and minimization measures/ CCMs, will achieve a meaningful long-term reduction of impacts and adverse effects at the scale of many individual project(s) (applicants or lessees) and the action area. Certain adverse effects to the PCEs and functions of designated bull trout critical habitat will be unavoidable and are anticipated.

At the scale of individual project(s) and applicant(s) or lessee(s), the USFWS expects that some degraded shoreline and nearshore habitat functions will be maintained. Repair, replacement, and maintenance of structural shoreline stabilization measures, overwater structures, boat ramps, and (limited) new or ancillary structures, will extend the functional lives of these features, and limit some natural shoreline processes.

As described by the Corps, repair, replacement, and maintenance "...fills or structures ... extend the life of the existing fills or structures ... [and] diminish the availability and function of nearshore and shoreline habitat[s] [for] the life of the structures ... [an estimated] 40 [to] 50 years" (USACE 2023, pp. 64, 65). "New structures ... [result] in ... reduction or modification [of] available nearshore habitat that juvenile salmonids, particularly juvenile ... Chinook salmon, use for rearing and migration"; even though, "the existing ... habitat ... is of low quality for salmonid rearing" (USACE 2023, p. 66). However, "The only authorized activities ... [along shorelines] in Resource Management classification ... [will be] public boat ramps ... As a result ... undeveloped [shorelines] will continue to function as they do under existing conditions ... [and] functions ... will be maintained" (USACE 2023, p. 61).

Some activities will continue to have localized adverse effects to aquatic habitat functions, including the PCEs of designated bull trout critical habitat. The programmatic will maintain some degraded habitat conditions and continue to impair and preclude some natural shoreline processes that are important to the maintenance and development of complex nearshore aquatic habitats; including, recruitment of and natural sources of sediment; recruitment of and natural sources of large wood; and, formation of variable depths, gradients, and substrate profiles.

The USFWS also expects that full and successful implementation of the program of ESA coverage and required avoidance and minimization measures, will achieve a meaningful long-term reduction of impacts and effects. The relevant, required, avoidance and minimization measures include, non-structural shoreline stabilization measures (where feasible); reduced

overwater footprints/ coverage; increased use and improved configuration of light-transmissive grating; significant removal of creosote-treated wood and associated water and sediment contamination; wider use of inert and environmentally-sensitive materials (including encapsulated floatation); preservation, maintenance, and replacement of functioning, native, riparian vegetation; and, specific and deliberate habitat improvements (including removal of derelict structures and debris, and placement/ installation of large wood). And, the USFWS expects that the improved design guidelines and specifications will result in repaired and replaced structures that require less frequent maintenance over the long-term. A reduced number and frequency of maintenance activities, repairs, and replacements will further avoid the damage and disruption caused by these repetitive activities.

## **9.1 Effects to the PCEs and Functions of Designated Bull Trout Critical Habitat**

Below we describe the foreseeable direct and indirect effects of the proposed federal action, and the effects of any interrelated or interdependent activities, on the PCEs and current functions of designated bull trout critical habitat.

### *1. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity, and provide thermal refugia.*

Within the action area, the current function of PCE #1 is *moderately* impaired and degraded. Dam operations significantly and pervasively alter the current function of PCE #1.

Some activities will continue to have localized adverse effects to the current function of PCE #1. In particular, repaired, replaced, and maintained structural shoreline stabilization measures and boat ramps, will continue at some locations to interrupt connectivity with springs, seeps, and sources of groundwater. And at some (or other) locations, activities will incorporate non-structural shoreline stabilization measures and other CCMs, so as to remove or reduce existing barriers and interruptions to connectivity with springs, seeps, and sources of groundwater.

At the scale of the action area, and at scales most relevant to individual bull trout, the USFWS expects that the proposed action will not measurably reduce sources of water or subsurface water connectivity. The USFWS expects no significant adverse effects to water quality, water quantity, or the availability of thermal refugia. We conclude that the current function of PCE #1 will be maintained and not degraded at the scale of the action area.

### *2. Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.*

Within the action area, the current function of PCE #2 is *severely* impaired and degraded.

Some activities will continue to have localized adverse effects to the current function of PCE #2. In particular, repaired, replaced, and maintained overwater structures and boat ramps, and (limited) new or ancillary structures, will continue at some locations to degrade function and present an impediment to migration along the shoreline. And at many locations, activities will

incorporate reduced overwater footprints/ coverage, increased use, and improved configuration of light-transmissive grating, and other CCMs, so as to improve function and remove or reduce impediments to migration along the shoreline.

At the scale of the action area, and at scales most relevant to individual bull trout, the USFWS expects that the proposed action will not introduce new or novel physical, biological, or water quality impediments to migration. The USFWS expects no significant adverse effects to current migratory functions provided by Lakes Cushman and Kokanee. We conclude that the current function of PCE #2 will be maintained and not degraded at the scale of the action area.

*3. An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.*

Within the action area, the current function of PCE #3 is *mildly* impaired and degraded. Lake Cushman supports prey species and abundant prey production, that bull trout rely on throughout the middle and upper NF Skokomish River basin. The prey base does not appear to be limiting for bull trout.

As described by the Corps, the proposed action will “...result in a small but long-term reduction in available rearing habitat for juvenile salmonids, [potentially] resulting in reduced prey abundance for bull trout” (USACE 2023, p. 72). However, “The [net] loss of functional shoreline resulting from new and replaced structures is unlikely to measurably reduce the abundance of bull trout prey, including macroinvertebrates and small fish” (USACE 2023, p. 80).

Construction activities will result in limited adverse effects to PCE #3, and unavoidable temporal losses or reductions to the amount of available bull trout prey. However, impacts to the bed, native substrates, and benthos will be limited and recoverable; and impacts to riparian vegetation and terrestrial sources of prey will also be limited and recoverable.

Repaired, replaced, and maintained structural shoreline stabilization measures, overwater structures, boat ramps, and (limited) new or ancillary structures, will continue at some locations to degrade current function and present an impediment to migration along the shoreline (see above); and these activities will also continue at some locations to degrade or impair functions that contribute to (and maintain) habitat complexity (see below).

However, at many locations, activities will incorporate CCMs (including non-structural shoreline stabilization measures, reduced overwater footprints/ coverage, increased use, and improved configuration of light-transmissive grating; preservation, maintenance, and replacement of functioning, native, riparian vegetation; and removal of derelict structures and debris). Successful implementation of the CCMs will serve to improve functions, remove or reduce impediments to migration along the shoreline (see above), and establish or allow for the establishment of higher functioning complex shoreline and nearshore habitats (see below).

At the scale of the action area, and at scales most relevant to individual bull trout, the USFWS expects that the proposed action will not further degrade the current function of PCE #3 or



reduce the abundant prey production and resources provided by Lakes Cushman and Kokanee. The USFWS expects that the prey base will not become limiting for bull trout. We conclude that the current function of PCE #3 will be maintained and not further degraded at the scale of the action area.

*4. Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.*

Within the action area, the current function of PCE #4 is *moderately to severely* impaired and degraded, especially for shorelines and nearshore habitats located in Shoreline Classifications A and B. Shorelines designated Resource Management are managed by Tacoma Power for specific resource objectives (e.g., protection of water quality; habitat conservation) and these shorelines and nearshore habitats retain substantially better current function(s).

The proposed action will “...contribute to the loss of habitat complexity by preventing erosion and natural processes that form complex shoreline habitat, including recruitment of large wood, natural sediment inputs, and growth of functional riparian vegetation” (USACE 2023, p. 72). And, “...beneficial effects may result from [implementing the] CCMs ... [resulting in] localized, improved aquatic habitat function along currently altered shorelines” (USACE 2023, p. 72). “The only authorized activities ... [along shorelines] in Resource Management classification ... [will be] public boat ramps ... As a result... undeveloped [shorelines] will continue to function as they do under existing conditions ... [and] functions ... will be maintained” (USACE 2023, p. 61).

Some activities will continue to have localized adverse effects to the current function of PCE #4. In particular, repaired, replaced, and maintained structural shoreline stabilization measures, overwater structures, boat ramps, and (limited) new or ancillary structures, will continue at some locations to degrade or impair functions that contribute to (and maintain) habitat complexity. And at many locations, activities will incorporate CCMs (including non-structural shoreline stabilization measures, reduced overwater footprints/ coverage, increased use and improved configuration of light-transmissive grating; preservation, maintenance, and replacement of functioning, native, riparian vegetation; and, removal of derelict structures and debris), so as to improve functions and establish or allow for the establishment of higher functioning complex shoreline and nearshore habitats.

At the scale of the action area, and at scales most relevant to individual bull trout, the USFWS expects that the proposed action will not further degrade or impair the natural processes that contribute to (and maintain) habitat complexity. The USFWS expects that shoreline and nearshore habitats in Lakes Cushman and Kokanee will continue to exhibit and provide moderately to severely impaired functions. We conclude that the current function of PCE #4 will be maintained and not further degraded at the scale of the action area.

*5. Water temperatures ranging from 2 °C to 15 °C (36 °F to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range.*

*Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.*

Within the action area, the current function of PCE #5 is *not impaired* or degraded.

The USFWS expects that the proposed action will have no measurable effect on the current function of PCE #5, at the scale of the action area or any other meaningful scale. We conclude that the current function of PCE #5 will be maintained and not further degraded at the scale of the action area.

*6. In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.*

The action area does not include bull trout spawning or early rearing habitats. This PCE, and its functions, are absent. The proposed action will have no effect on the function of PCE #6.

*7. A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.*

Within the action area, the current function of PCE #7 is *moderately* impaired and degraded. Dam operations significantly and pervasively alter the current function of PCE #7.

The USFWS expects that the proposed action will have no measurable effect on the current function of PCE #7, at the scale of the action area or any other meaningful scale. We conclude that the current function of PCE #7 will be maintained and not further degraded at the scale of the action area.

*8. Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.*

Within the action area, the current function of PCE #8 is *mildly* impaired and degraded.

Activities will incorporate CCMs, including significant removal of creosote-treated wood and associated water and sediment contamination, and wider use of inert and environmentally-sensitive materials (including encapsulated floatation). “Beneficial effects may result from [implementing the] CCMs ... [resulting in] water quality improvements by removing chronic source[s] of contamination” (USACE 2023, p. 73). Other, current sources of impairment will not be meaningfully addressed or changed (e.g., existing residential and community septic systems, associated discharges to groundwater).

At the scale of the action area, and at scales most relevant to individual bull trout, the USFWS expects that the proposed action will not further degrade water quality or quantity. The USFWS expects that water quality may be modestly improved along some shorelines and in some portions of Lakes Cushman and Kokanee. We conclude that the current function of PCE #8 will be maintained and not further degraded at the scale of the action area.

*9. Sufficiently low levels of occurrence of non-native predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.*

Within the action area, the current function of PCE #9 is *mildly* impaired and degraded. Within the action area, non-native and introduced fish species, represent both an exploitable prey base for bull trout, and may compete with (or rarely prey upon) bull trout.

“The proposed action will have no effect on the abundance of non-native or introduced species” (USACE 2023, p. 73). Some non-native or introduced species (e.g., bass) take advantage of artificial overwater and in-water structure (e.g., piers, piles, floats); these structures, and the light conditions they create or alter, present opportunities for ambush predators, with significant consequences especially for rearing or migrating juvenile salmonids (Rondorf, Rutz, and Charrier 2010, entire).

However, at many locations, activities will incorporate reduced overwater footprints/ coverage, increased use and improved configuration of light-transmissive grating, and other CCMs, so as to reduce and not increase the amount or extent of artificial overwater and in-water structure. The proposed action will not introduce or present the risk of introducing any new or additional non-native or introduced fish species.

At the scale of the action area, and at scales most relevant to individual bull trout, the USFWS expects that the proposed action will not measurably affect the current function of PCE #9. We conclude that the current function of PCE #9 will be maintained and not degraded at the scale of the action area.

## **10 CUMULATIVE EFFECTS: Designated Bull Trout Critical Habitat**

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Future state, tribal, local, and private actions that are reasonably certain to occur in the action area include management of commercial forest lands and small landowner holdings in the terrestrial uplands; private landowner (and lessee) development and redevelopment in the terrestrial uplands; shoreline management, water quality, and watershed management programs and activities implemented by state and local authorities (Washington Department of Ecology, Mason County, other); programs and activities implemented by the Skokomish Indian Tribe;

and, private landowner (and lessee) development and redevelopment, adjacent to or in the vicinity of the shorelines, that do not require a CWA permit or application (i.e., actions without discharge of dredged or fill material into waters of the United States).

Management of commercial forest lands and small landowner holdings in the terrestrial uplands is limited (or very limited) in the action area. Most (nearly all) of these forested lands are administered by either Tacoma Power (Cushman Hydroelectric Project), the state, or U.S. Forest Service (National Forest lands, Olympic National Forest).

Significant private landowner (and lessee) development and redevelopment in the terrestrial uplands, and adjacent to or in the vicinity of the shorelines (but not requiring a CWA permit or application), can be expected. This has been a growing trend for two decades or more. However, contemporary zoning, building/ development, and environmental permits and approvals (e.g., shoreline requirements, critical area ordinances and requirements, solid waste and on-site disposal requirements), should serve to avoid and minimize impacts, and progressively correct damage caused by past practices. Tacoma Power administers additional authorities as part of the Cushman Hydroelectric Project, that should further serve to place limits on the scope and extent of development and redevelopment.

Programs and activities implemented by state and local authorities, addressing shoreline management, water quality, and watershed management, will also serve to identify and correct or improve environmental deficiencies. We expect that these actions will benefit and not further degrade or impair watershed, shoreline, aquatic habitat, and water quality conditions and functions. Similarly, we expect that programs and activities implemented by the Skokomish Indian Tribe will generally serve to meaningfully restore and benefit environmental functions and natural resource conditions.

Considered individually, we expect that future state, tribal, local, and private actions that are reasonably certain to occur in the action area, will have both beneficial effects and adverse effects to watershed, shoreline, aquatic habitat, and water quality conditions and functions in the action area, and Lakes Cushman and Kokanee specifically. When considered as a whole, the USFWS expects and concludes, that relevant and applicable permits, approvals, and authorities, should serve well to protect current conditions and functions, and may serve over time to modestly improve these at the scale of the action area. The USFWS expects that future state, tribal, local, and private actions occurring in the action area, will maintain the significant bull trout conservation role provided by Lakes Cushman and Kokanee, and not preclude bull trout recovery at the scale of the action area and beyond.

## **11 INTEGRATION AND SYNTHESIS: Designated Bull Trout Critical Habitat**

The Integration and Synthesis section is the final step in assessing the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action and the cumulative effects to the status of the species and critical habitat, and the environmental baseline, to formulate our biological opinion as to whether the proposed action is likely to: (1) appreciably reduce the likelihood of both survival and recovery of the

species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the value of designated critical habitat for the conservation of the species.

The proposed federal action includes implementation of a program of ESA coverage for specific shoreline activities. Covered activities will include specific avoidance and minimization measures (including design guidelines and criteria, required procedure and specifications, and excluded activities).

The action area includes the full extent of the flow-regulated reservoirs, Lakes Cushman and Kokanee). Covered activities will affect and/or influence shoreline, riparian, and aquatic habitat conditions throughout Lakes Cushman and Kokanee, and on long temporal timelines (i.e., for the functional life of new, repaired, replaced, and maintained shoreline structures and features).

Lake Cushman provides core FMO habitat for subadult and adult bull trout and supports prey species and abundant prey production that bull trout rely on throughout the middle and upper NF Skokomish River basin. Habitats and prey production provided by Lake Cushman are essential to maintenance of existing bull trout distribution and abundance in the Skokomish River bull trout core area as a whole.

Lakes Cushman and Kokanee are designated as bull trout critical habitat (for the Coastal Recovery Unit). Baseline environmental conditions in the action area are variable; the PCEs of designated bull trout critical habitat currently exhibit mildly to severely impaired conditions and functions: (not impaired, or mildly impaired) PCE #s 3, 5, 8, and 9 (abundant food/ prey base; water temperatures; water quality and quantity; and, non-native species, respectively); (moderately impaired) PCE #s 1 and 7 (sources of water that contribute to quality, quantity, and thermal refugia; and, a natural hydrograph, respectively); and, (severely impaired) PCE #s 2 and 4 (migration habitat with minimal impediments; and, complex shoreline aquatic environments and processes, respectively). The action area does not include bull trout spawning or early rearing habitats; PCE #6 and its functions are absent.

Considered at the scale of the action area, the foreseeable effects of the proposed federal action, will maintain and not further degrade the current condition and function of each of the PCEs. The described, foreseeable, adverse effects to the current condition and function of the PCEs, will be specific to some covered activities, will be localized, and limited in spatial and/or temporal extent. Successful implementation and incorporation of the required avoidance and minimization measures (including excluded activities) will improve PCE functions and conditions at the scale of the action area (i.e., throughout Lakes Cushman and Kokanee), and allow for the establishment of higher functioning shoreline and nearshore habitats.

The anticipated direct and indirect effects of the proposed federal action, combined with the effects of interrelated and interdependent actions, and the cumulative effects associated with future state, tribal, local, and private actions, will not prevent the PCEs of designated bull trout critical habitat from being maintained, and will not degrade the current ability to establish functioning PCEs at the scale of the action area (Lakes Cushman and Kokanee). Critical habitat within the action area will continue to serve the intended conservation role for the species, at the

scale of the Critical Habitat Unit/Sub-Unit, the population(s)/distribution in Washington, the Coastal Recovery Unit, and range.

## **12 CONCLUSION: Designated Bull Trout Critical Habitat**

After reviewing the current status of designated bull trout critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the USFWS's biological opinion that the action, as proposed, will not destroy or adversely modify designated bull trout critical habitat.

## **13 INCIDENTAL TAKE STATEMENT**

Section 9 of the ESA and federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. *Harm* is defined by the USFWS as an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering (50 CFR 17.3). *Harass* is defined by the USFWS as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to breeding, feeding, or sheltering (50 CFR 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

## **14 AMOUNT OR EXTENT OF TAKE**

The USFWS does not expect that the proposed action will incidentally take any listed species. Since no take is anticipated or exempted, no Reasonable and Prudent Measures (RPMs) or terms and conditions are provided below (except for monitoring and reporting requirements). If incidental take is detected during implementation of the proposed action, reinitiation of formal consultation should be requested, and any operations causing such take must cease pending the outcome of the reinitiated consultation.

## **15 EFFECT OF THE TAKE**

No take is anticipated or exempted. In the accompanying Biological Opinion, the USFWS determined that the action, as proposed, will not result in the destruction or adverse modification of designated bull trout critical habitat.

## 16 REASONABLE AND PRUDENT MEASURES

The conservation measures negotiated in cooperation with the USFWS, and included as part of the proposed action, constitute all of the reasonable measures necessary to minimize the impacts of incidental take. On that basis, no RPMs (except for monitoring and reporting requirements) are included in this Incidental Take Statement.

## 17 TERMS AND CONDITIONS

The Corps must comply with the following terms and conditions, which outline required monitoring and reporting requirements. These terms and conditions are non-discretionary.

1. The Corps shall compile information annually and submit a report to the USFWS (Washington Fish and Wildlife Office, Coastal Lowland Aquatic Marine Zone Team, Attn: Assistant Field Supervisor), by March 1 each year. The Corps shall report the number of activities authorized and associated metrics. Metrics for annual reporting shall include, but not be limited to, the following:
  - a. *(For the Program of Activities)* Number of Permit Applicants/Activities Considered for Programmatic Coverage; Type and Location.
  - b. *(Per Authorized Activity)* General or Other (Type and Location).
  - c. *(Per Authorized Activity)* Category A Totals:
    - i. Shoreline Stabilization Measures (linear ft existing; linear ft proposed; fill/ cubic yards existing, approx.; fill/ cubic yards proposed, approx.; creosote-treated wood removed, approx. cubic yards).
    - ii. Boat Ramps – Community and/or Public (square ft existing; square ft proposed; fill/ cubic yards existing, approx.; fill/ cubic yards proposed, approx.).
    - iii. Docks/Piers – Single-Family, ‘Shared’, and Community (square ft existing; square ft proposed; creosote-treated wood removed, approx. cubic yards).
  - d. *(Per Authorized Activity)* Category B (New or Ancillary Structures) Totals:
    - i. Docks/Piers, ‘Shared’ (square ft existing; square ft proposed; creosote-treated wood removed, approx. cubic yards).
    - ii. Mooring Buoys (number replaced; number new).
    - iii. Swimming Floats (number replaced; number new).

- e. *(Per Authorized Activity)* Category C Totals:
  - i. Habitat Improvement Actions (Type and Location).
- f. *(For the Program of Activities)* Combined, **Net Totals**, for the following:
  - i. Structural Shoreline Stabilization Measures (linear ft existing; linear ft proposed; fill/ cubic yards existing, approx.; fill/ cubic yards proposed, approx.; creosote-treated wood removed, approx. cubic yards).
  - ii. Overwater Structures (square ft existing; square ft proposed; creosote-treated wood removed, approx. cubic yards).
  - iii. Boat Ramps (square ft existing; square ft proposed; fill/ cubic yards existing, approx.; fill/ cubic yards proposed, approx.).
  - iv. (Limited) New or Ancillary Structures (square ft existing; square ft proposed; creosote-treated wood removed, approx. cubic yards).

The USFWS is to be notified within three working days upon locating a dead, injured, or sick endangered or threatened species specimen. Initial notification must be made to the nearest USFWS Law Enforcement Office. Notification must include the date, time, precise location of the injured animal or carcass, and any other pertinent information. Care should be taken in handling sick or injured specimens to preserve biological materials in the best possible state for later analysis of cause of death, if that occurs. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed. Contact the USFWS Law Enforcement Office at (425) 883-8122, or the Washington Fish and Wildlife Office at (360) 753-9440.

## 18 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. The USFWS recommends to the Corps (and Tacoma Power), outreach and assistance should be provided to potential users of the programmatic, Applicants, Consultants-Agents, and Contractors, to inform and advise these parties regarding the program of ESA coverage for shoreline activities (covered activities); activities excluded from programmatic ESA coverage; avoidance and minimization measures, including design guidelines, design criteria, required procedures, and specifications; alignment with the Tacoma Power Shoreline Use Specifications and Permitting Guidelines (Tacoma Power 2014); procedures for assessing, determining, and documenting feasibility of shoreline



stabilization measures (structural and non-structural); procedures for assessing, describing, and minimizing impacts to functioning, native riparian vegetation; procedures for assessing, describing, and documenting proposed repair and/or replacement of shared dock/pier structures; and/or other related topics. The USFWS may be available to assist with the delivery of this outreach and assistance, whether provided in writing, through a webinar(s), or by other means.

2. The USFWS recommends to the Corps (and Tacoma Power), we should strive for alignment and consistency with the Tacoma Power Shoreline Use Specifications and Permitting Guidelines (Tacoma Power 2014) when implementing the program of ESA coverage. Doing so will enhance efficiency and predictability for potential users of the programmatic, Applicants, Consultants-Agents, and Contractors. In the event of significant future updates to the Shoreline Use Specifications and Permitting Guidelines (Tacoma Power 2014), the USFWS, Corps, and Tacoma Power should use future annual reporting and/or meetings to identify, discuss, and agree-upon any related adjustments to future implementation of the programmatic ESA coverage.
3. The program of ESA coverage for shoreline activities addresses repair, replacement, and maintenance of structural shoreline stabilization measures, overwater structures, etc., and only limited, new or ancillary structures. New single-family docks, new single-family piers, and new structural shoreline stabilization measures are excluded from programmatic ESA coverage. If a specific permit(s), shoreline activity, or work cannot be confirmed for coverage under the programmatic, the USFWS and Corps will identify information needs, and discuss procedural steps and timelines in support of individual ESA Section 7 consultation. The USFWS recommends to the Corps, so as to achieve the principal objective, i.e., basin-scale conservation of natural shoreline environments and processes, and the ESA-listed salmonids that rely on these, CWA permits issued (or proposed for issuance) by the Corps should include or incorporate conservation offsets and/or mitigation if/when activities include new structures.

In order for the USFWS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

## **19 REINITIATION NOTICE**

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or 4) a new species is listed

or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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# **Appendix A: Guidance for Identifying Marbled Murrelet Nest Trees in Washington State**



Photos by Tom Bloxton, USFS

U.S. Fish and Wildlife Service  
Washington Fish and Wildlife Office (WFWO)  
Lacey, WA  
April 2012

The definition of marbled murrelet (murrelet) nesting habitat is an important component of any assessment of murrelet exposure in the terrestrial environment. It informs evaluations of exposure risk (or likelihood of occupancy) at the site scale and provides the basis for programmatic scale assessments. For these reasons, we developed the following guidance to assist action agencies and other parties in their assessment of potential impacts to the species in Washington State. If a tree or forested area does not support the habitat features described below, it is our best professional judgment that it is “extremely unlikely” to support a nesting murrelet.

This guidance is the result of extensive collaboration among WFWO staff and managers, including John Grettenberger, Carolyn Scafidi, Emily Teachout, Vince Harke, Kim Flotlin, Deanna Lynch, and Mark Ostwald. Bridgette Tuerler of the Oregon Fish and Wildlife Office also provided valuable insights.

We believe the definition of nesting habitat for purposes of assessing exposure risk should be reasonably conservative and supported by section 7 policy. Given the species’ declining status and extremely poor resiliency at the population scale to any reduction in fitness<sup>1</sup>, it is critical that potential impacts in the terrestrial environment receive careful scrutiny if population declines are to be stabilized or reversed.

The following guidance is based on characteristics associated with almost all of the nests found to date in Washington State, as well as data from other nests in similar forest conditions in Oregon and British Columbia. It is important to note that a very small number of nests have been documented in cliffs (Nelson 1997, p. 6; Bloxton and Raphael 2009, p. 6) and deciduous trees (Bradley and Cooke 2001, p. 53) and these situations are not addressed in the following definition. Additionally, the likelihood of nest success was not a consideration in the development of this definition (i.e., expected high predation rates had no influence on the definition). At this time, there is no simple linear relationship between habitat quality and likelihood or density of nests (Burger and Waterhouse 2009, p. 109). Nonetheless, we recognize that individual trees in a matrix of urban, agricultural, or certain rural landscapes may support the habitat features described below but are still “extremely unlikely” to support nesting murrelets. When there are questions about likelihood of occupancy in a particular location, the WFWO should be contacted for assistance.

### Important Components of Marbled Murrelet Nest Trees in Washington State

Murrelet nest trees in Washington occur within 55 mi (88.5 km) of marine waters and support the following structural and landscape components:

**Platforms** – The most important component of murrelet nest trees is the presence of platforms. Old-growth, mature, or younger coniferous forests with appropriate structure can provide these platforms. We define a platform as a relatively flat surface  $\geq 33$  ft (10 m) above the ground in the live crown of a coniferous tree. A platform should be at least 4 in (10 cm) wide (Hamer and Nelson 1995, p. 74; Nelson and Wilson 2002, p. 59). A platform may be a depression on a branch, an area where a limb branches, a surface created by a deformity such as a dwarf

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<sup>1</sup> Fitness is defined as an individual’s current or expected future reproductive contribution.



mistletoe broom, a debris/moss platform or stick nest equal to or greater than 4 inches in diameter including associated moss, lichen, or duff if present (Bloxtton and Raphael 2009, var.; Burger 2002, p. 41; Evans Mack et al. 2003, p. 2; Hamer and Nelson 1995, p. 79; Nelson 1997, p. 16). Any forested area with one observed platform is capable of supporting a nest (Evans Mack et al. 2003, p. 3). Platforms may be clumped in one area or dispersed throughout the forested area.

**Cover** - Other important attributes of nest trees are vertical and horizontal cover for platforms to protect chicks and adults from predation. Higher quality nest sites have platforms that are generally protected by branches above (vertical cover) or to the side (horizontal cover) (Huff et al. 2006, p. 14). Such cover can be provided by limbs or foliage within the same tree or in adjacent trees. At this time, we are unable to provide specific measurements or criteria to characterize these habitat attributes.

**Other Tree and Forested Area Characteristics** – Additional characteristics of murrelet nest trees are accessibility, tree diameter, and tree height. Variable canopy structure or openings that allow murrelets to access nest platforms is also an important consideration (Hamer and Nelson 1995, p. 80-81), but the appropriate degree of canopy cover cannot be quantified without additional research (Grenier and Nelson 1995, p. 201). Although tree diameter and height have been positively correlated with platform size and abundance, this relationship may change depending on the variety of tree species and forest types murrelets use for nesting (Nelson and Wilson 2002, p. 100; Huff et al. 2006, p. 12). The smallest nest tree documented to date was a 19-inch (48.3-cm) diameter-at-breast-height (dbh) western hemlock in Oregon (Nelson and Wilson 2002, p. 43). However, dbh and height should not be used to limit consideration if adequate structure is present, and dbh should not be averaged at the stand level.

Other stand-level considerations are worth noting: 1) murrelets have occupied small patches of habitat within larger areas of unsuitable habitat (Nelson and Wilson 2002, p. 104); 2) some occupied sites have included large, residual trees in low densities (less than one tree per acre (<0.41 ha)) (Grenier and Nelson 1995, p. 196); and 3) over 20 percent of occupied sites in Oregon were  $\leq$  80 years old (Grenier and Nelson 1995, p. 193). Given these considerations, any forested area with a residual tree component, or one platform, may support a murrelet nest tree (Evans Mack et al. 2003, p. 4). It is forest structure that is important to murrelets (Grenier and Nelson 1995; p. 199).

In summary, and for purposes of section 7 consultation, the WFWO considers potential nest trees to be coniferous trees within 55 mi (88.5 km) of marine waters that support at least one 4-inch (10.2-cm) diameter platform located at least 33 ft (10 meters) above the ground, with horizontal and vertical cover. If a tree or forested area does not support these habitat features, it is our determination that it is “extremely unlikely” to support a murrelet nest.

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## **Appendix B**

### **Status of Designated Critical Habitat: Bull Trout**

Past designations of critical habitat have used the terms "primary constituent elements" (PCEs), "physical and biological features" (PBFs) or "essential features" to characterize the key components of critical habitat that provide for the conservation of the listed species. The new critical habitat regulations (81 FR 7214) discontinue use of the terms "PCEs" or "essential features" and rely exclusively on use of the term PBFs for that purpose because that term is contained in the statute. To be consistent with that shift in terminology and in recognition that the terms PBFs, PCEs, and essential habitat features are synonymous in meaning, we are only referring to PBFs herein. Therefore, if a past critical habitat designation defined essential habitat features or PCEs, they will be referred to as PBFs in this document. This does not change the approach outlined above for conducting the "destruction or adverse modification" analysis, which is the same regardless of whether the original designation identified PCEs, PBFs or essential features.

### **Current Legal Status of the Critical Habitat**

#### *Current Designation*

The U.S. Fish and Wildlife Service (Service) published a final critical habitat designation for the coterminous United States population of the bull trout on October 18, 2010 (USFWS 2010, entire); the rule became effective on November 17, 2010. A justification document was also developed to support the rule and is available on the Service's website: (<http://www.fws.gov/pacific/bulltrout>). The scope of the designation involved the species' coterminous range, which includes the Coastal, Klamath, Mid-Columbia, Upper Snake, Columbia Headwaters and St. Mary's Recovery Unit population segments. Rangelwide, the Service designated reservoirs/lakes and stream/shoreline miles as bull trout critical habitat (Table 1). Designated bull trout critical habitat is of two primary use types: 1) spawning and rearing, and 2) foraging, migration, and overwintering (FMO).

Table 1. Stream/Shoreline Distance and Reservoir/Lake Area Designated as Bull Trout Critical Habitat.

State	Stream/Shoreline Miles	Stream/Shoreline Kilometers	Reservoir/Lake Acres	Reservoir/Lake Hectares
Idaho	8,771.6	14,116.5	170,217.5	68,884.9
Montana	3,056.5	4,918.9	221,470.7	89,626.4
Nevada	71.8	115.6	-	-
Oregon <sup>1</sup>	2,835.9	4,563.9	30,255.5	12,244.0
Oregon/Idaho <sup>2</sup>	107.7	173.3	-	-
Washington	3,793.3	6,104.8	66,308.1	26,834.0
Washington (marine)	753.8	1,213.2	-	-
Washington/Idaho	37.2	59.9	-	-
Washington/Oregon	301.3	484.8	-	-
Total <sup>3</sup>	19,729.0	31,750.8	488,251.7	197,589.2

<sup>1</sup> No shore line is included in Oregon

<sup>2</sup> Pine Creek Drainage which falls within Oregon

<sup>3</sup> Total of freshwater streams: 18,975

The 2010 revision increases the amount of designated bull trout critical habitat by approximately 76 percent for miles of stream/shoreline and by approximately 71 percent for acres of lakes and reservoirs compared to the 2005 designation.

The final rule also identifies and designates as critical habitat approximately 1,323.7 km (822.5 miles) of streams/shorelines and 6,758.8 ha (16,701.3 acres) of lakes/reservoirs of unoccupied habitat to address bull trout conservation needs in specific geographic areas in several areas not occupied at the time of listing. No unoccupied habitat was included in the 2005 designation. These unoccupied areas were determined by the Service to be essential for restoring functioning migratory bull trout populations based on currently available scientific information. These unoccupied areas often include lower main stem river environments that can provide seasonally important migration habitat for bull trout. This type of habitat is essential in areas where bull trout habitat and population loss over time necessitates reestablishing bull trout in currently unoccupied habitat areas to achieve recovery.

The final rule continues to exclude some critical habitat segments based on a careful balancing of the benefits of inclusion versus the benefits of exclusion. Critical habitat does not include: 1) waters adjacent to non-Federal lands covered by legally operative incidental take permits for habitat conservation plans (HCPs) issued under section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended (Act), in which bull trout is a covered species on or before the publication of this final rule; 2) waters within or adjacent to Tribal lands subject to certain commitments to conserve bull trout or a conservation program that provides aquatic resource protection and restoration through collaborative efforts, and where the Tribes indicated that inclusion would impair their relationship with the Service; or 3) waters where impacts to national security have been identified (USFWS 2010, p. 63903). Excluded areas are approximately 10 percent of the stream/shoreline miles and 4 percent of the lakes and reservoir acreage of designated critical habitat. Each excluded area is identified in the relevant Critical Habitat Unit

(CHU) text, as identified in paragraphs (e)(8) through (e)(41) of the final rule. It is important to note that the exclusion of waterbodies from designated critical habitat does not negate or diminish their importance for bull trout conservation. Because exclusions reflect the often complex pattern of land ownership, designated critical habitat is often fragmented and interspersed with excluded stream segments.

## **The Physical and Biological Features**

### *Conservation Role and Description of Critical Habitat*

The conservation role of bull trout critical habitat is to support viable core area populations (USFWS 2010, p. 63898). The core areas reflect the metapopulation structure of bull trout and are the closest approximation of a biologically functioning unit for the purposes of recovery planning and risk analyses. CHUs generally encompass one or more core areas and may include FMO areas, outside of core areas, that are important to the survival and recovery of bull trout.

Thirty-two CHUs within the geographical area occupied by the species at the time of listing are designated under the revised rule. Twenty-nine of the CHUs contain all of the physical or biological features identified in this final rule and support multiple life-history requirements. Three of the mainstem river units in the Columbia and Snake River Basins contain most of the physical or biological features necessary to support the bull trout's particular use of that habitat, other than those physical biological features associated with physical and biological features (PBFs) 5 and 6, which relate to breeding habitat.

The primary function of individual CHUs is to maintain and support core areas, which 1) contain bull trout populations with the demographic characteristics needed to ensure their persistence and contain the habitat needed to sustain those characteristics (Rieman and McIntyre 1993, p. 19); 2) provide for persistence of strong local populations, in part, by providing habitat conditions that encourage movement of migratory fish (MBTSG 1998, pp. 48-49; Rieman and McIntyre 1993, pp. 22-23); 3) are large enough to incorporate genetic and phenotypic diversity, but small enough to ensure connectivity between populations (Hard 1995, pp. 314-315; Healey and Prince 1995, p. 182; MBTSG 1998, pp. 48-49; Rieman and McIntyre 1993, pp. 22-23); and 4) are distributed throughout the historic range of the species to preserve both genetic and phenotypic adaptations (Hard 1995, pp. 321-322; MBTSG 1998, pp. 13-16; Rieman and Allendorf 2001, p. 763; Rieman and McIntyre 1993, p. 23).

### *Physical and Biological Features for Bull Trout*

Within the designated critical habitat areas, the PBFs for bull trout are those habitat components that are essential for the primary biological needs of foraging, reproducing, rearing of young, dispersal, genetic exchange, or sheltering. Based on our current knowledge of the life history, biology, and ecology of this species and the characteristics of the habitat necessary to sustain its essential life-history functions, we have determined that the PBFs, as described within USFWS 2010, are essential for the conservation of bull trout. A summary of those PBFs follows.

1. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

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

The revised PBF's are similar to those previously in effect under the 2005 designation. The most significant modification is the addition of a ninth PBF to address the presence of nonnative predatory or competitive fish species. Although this PBF applies to both the freshwater and marine environments, currently no non-native fish species are of concern in the marine environment, though this could change in the future.

Note that only PBFs 2, 3, 4, 5, and 8 apply to marine nearshore waters identified as critical habitat. Also, lakes and reservoirs within the CHUs also contain most of the physical or biological features necessary to support bull trout, with the exception of those associated with PBFs 1 and 6. Additionally, all except PBF 6 apply to FMO habitat designated as critical habitat.



Critical habitat includes the stream channels within the designated stream reaches and has a lateral extent as defined by the bankfull elevation on one bank to the bankfull elevation on the opposite bank. Bankfull elevation is the level at which water begins to leave the channel and move into the floodplain and is reached at a discharge that generally has a recurrence interval of 1 to 2 years on the annual flood series. If bankfull elevation is not evident on either bank, the ordinary high-water line must be used to determine the lateral extent of critical habitat. The lateral extent of designated lakes is defined by the perimeter of the waterbody as mapped on standard 1:24,000 scale topographic maps. The Service assumes in many cases this is the full-pool level of the waterbody. In areas where only one side of the waterbody is designated (where only one side is excluded), the mid-line of the waterbody represents the lateral extent of critical habitat.

In marine nearshore areas, the inshore extent of critical habitat is the mean higher high-water (MHHW) line, including the uppermost reach of the saltwater wedge within tidally influenced freshwater heads of estuaries. The MHHW line refers to the average of all the higher high-water heights of the two daily tidal levels. Marine critical habitat extends offshore to the depth of 10 meters (m) (33 ft) relative to the mean low low-water (MLLW) line (zero tidal level or average of all the lower low-water heights of the two daily tidal levels). This area between the MHHW line and minus 10 m MLLW line (the average extent of the photic zone) is considered the habitat most consistently used by bull trout in marine waters based on known use, forage fish availability, and ongoing migration studies and captures geological and ecological processes important to maintaining these habitats. This area contains essential foraging habitat and migration corridors such as estuaries, bays, inlets, shallow subtidal areas, and intertidal flats.

Adjacent shoreline riparian areas, bluffs, and uplands are not designated as critical habitat. However, it should be recognized that the quality of marine and freshwater habitat along streams, lakes, and shorelines is intrinsically related to the character of these adjacent features, and that human activities that occur outside of the designated critical habitat can have major effects on physical and biological features of the aquatic environment.

Activities that cause adverse effects to critical habitat are evaluated to determine if they are likely to “destroy or adversely modify” critical habitat by no longer serving the intended conservation role for the species or retaining those PBFs that relate to the ability of the area to at least periodically support the species. Activities that may destroy or adversely modify critical habitat are those that alter the PBFs to such an extent that the conservation value of critical habitat is appreciably reduced (USFWS 2010, pp. 63898:63943; USFWS 2004a, pp. 140-193; USFWS 2004b, pp. 69-114). The Service’s evaluation must be conducted at the scale of the entire critical habitat area designated, unless otherwise stated in the final critical habitat rule (USFWS and NMFS 1998, Ch. 4 p. 39). Thus, adverse modification of bull trout critical habitat is evaluated at the scale of the final designation, which includes the critical habitat designated for the Klamath River, Jarbidge River, Columbia River, Coastal-Puget Sound, and Saint Mary-Belly River population segments. However, we consider all 32 CHUs to contain features or areas essential to the conservation of the bull trout (USFWS 2010, pp. 63898:63901, 63944). Therefore, if a proposed action would alter the physical or biological features of critical habitat to an extent that appreciably reduces the conservation function of one or more critical habitat units for bull trout, a finding of adverse modification of the entire designated critical habitat area may be warranted (USFWS 2010, pp. 63898:63943).

### *Current Critical Habitat Condition Rangewide*

The condition of bull trout critical habitat varies across its range from poor to good. Although still relatively widely distributed across its historic range, the bull trout occurs in low numbers in many areas, and populations are considered depressed or declining across much of its range (Ratliff and Howell 1992, entire; Schill 1992, p. 40; Thomas 1992, p. 28; Buchanan et al. 1997, p. vii; Rieman et al. 1997, pp. 15-16; Quigley and Arbelbide 1997, pp. 1176-1177). This condition reflects the condition of bull trout habitat. The decline of bull trout is primarily due to habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, past fisheries management practices, impoundments, dams, water diversions, and the introduction of nonnative species (USFWS 1998, pp. 31648-31649; USFWS 1999, p. 17111).

There is widespread agreement in the scientific literature that many factors related to human activities have impacted bull trout and their habitat, and continue to do so. Among the many factors that contribute to degraded PBFs, those which appear to be particularly significant and have resulted in a legacy of degraded habitat conditions are as follows: 1) fragmentation and isolation of local populations due to the proliferation of dams and water diversions that have eliminated habitat, altered water flow and temperature regimes, and impeded migratory movements (Dunham and Rieman 1999, p. 652; Rieman and McIntyre 1993, p. 7); 2) degradation of spawning and rearing habitat and upper watershed areas, particularly alterations in sedimentation rates and water temperature, resulting from forest and rangeland practices and intensive development of roads (Fraley and Shepard 1989, p. 141; MBTSG 1998, pp. ii - v, 20-45); 3) the introduction and spread of nonnative fish species, particularly brook trout and lake trout, as a result of fish stocking and degraded habitat conditions, which compete with bull trout for limited resources and, in the case of brook trout, hybridize with bull trout (Leary et al. 1993, p. 857; Rieman et al. 2006, pp. 73-76); 4) in the Coastal-Puget Sound region where amphidromous bull trout occur, degradation of mainstem river FMO habitat, and the degradation and loss of marine nearshore foraging and migration habitat due to urban and residential development; and 5) degradation of FMO habitat resulting from reduced prey base, roads, agriculture, development, and dams.

### *Effects of Climate Change on Bull Trout Critical Habitat*

One objective of the final rule was to identify and protect those habitats that provide resiliency for bull trout use in the face of climate change. Over a period of decades, climate change may directly threaten the integrity of the essential physical or biological features described in PBFs 1, 2, 3, 5, 7, 8, and 9. Protecting bull trout strongholds and cold water refugia from disturbance and ensuring connectivity among populations were important considerations in addressing this potential impact. Additionally, climate change may exacerbate habitat degradation impacts both physically (e.g., decreased base flows, increased water temperatures) and biologically (e.g., increased competition with non-native fishes).

Many of the PBFs for bull trout may be affected by the presence of toxics and/or increased water temperatures within the environment. The effects will vary greatly depending on a number of factors which include which toxic substance is present, the amount of temperature increase, the likelihood that critical habitat would be affected (probability), and the severity and intensity of any effects that might occur (magnitude).

The ability to assign the effects of gradual global climate change bull trout critical habitat or to a specific location on the ground is beyond our technical capabilities at this time.

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