

Restoration Programmatic for the State of Washington Specific Project Information Form

U.S. Army Corps of Engineers, Seattle District, Regulatory Branch

July 29, 2008 version

Use this form to notify the U.S. Army Corps of Engineers, Seattle District (Corps) of a proposed restoration project that falls within the range of the nine restoration activities considered by National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) during its Section 7 of the Endangered Species Act (ESA) consultation (NMFS Reference No. 2008/03598; USFWS Reference No. 13410-2008-F-0209). You may also use this form if your project slightly deviates from the description and scope of the nine project categories addressed in this consultation. However, should the resulting impacts exceed those considered in the NMFS and USFWS Biological Opinion you will need to consult individually (which generally takes longer) and potentially provide additional information. The Corps is responsible, in most cases, for ensuring that a project complies with the requirements of Section 106 of the National Historic Preservation Act.

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I GENERAL INFORMATION

A. Date: 3/8/17 Corps reference no.: _____

B. Applicant name (same as in JARPA): Tawni Dalziel

Address City of Sammamish

801 228th Ave SE, Sammamish, Washington 98075

C. Agent Name (same as on JARPA): Kevin O'Brien

Address: 11241 Willows Road NE, Suite 200

Redmond, Washington 98052

D. Location(s) of activity:

Section: 32 Township: 25 North Range: 06 East

Latitude (xxx° xx' xx.x"): 47° 36' 39.4"N

Longitude (xxx° xx' xx.x"): 122° 04' 10.1"W

UTM: _____

10T 569872.73mE 5273369.98m N

Waterbody: Zackuse Creek

County: King

ESU or IRU: Puget Sound

E. Project elements. In the table below, fill in the maximum length of each project element proposed and the number of structures where applicable. This information will be used by the Services for calculating your take exemption:

Action Category	Project Length and Width where applicable	Number of Structures
1. Fish Passage:		
a. Culvert Replacement and Relocation	3 culverts—12 ft. wide x 62 ft. long; 12 ft. wide x 19 ft. long; 12 ft. wide x 12 ft. long	3
b. Retrofitting Culverts		
c. Culvert Removal		
d. Tidegate Removal		
e. Removal or Modification of Sediment Bars or Terraces		
f. Temporary Placement of Sandbags, Hay Bales and Ecology Blocks		
g. Construction of Structures to Provide Passage over Small Dams		
2. Installation of Instream Structures:		
a. Placement of Woody Debris	--	?
b. Placement of Live Stakes		
c. Placement of Engineered Log Jams		
d. Grade Control ELJs		
e. Trapping Mobile Wood		

Action Category	Project Length and Width where applicable	Number of Structures
f. Placement of Boulders	13 boulder bands (each 8 ft. wide x 1 ft. long)	26 1-man boulders and 52 2-man boulders total (2-1 man and 4 2-man per band)
g. Boulder Weirs and Roughened Channels		13 boulder bands
h. Gravel Placement Associated with Structure Placement	530 linear feet (stream restoration) 62 lf (ELS Parkway culvert) 124 lf (County culverts) Total = 690 LF (5,520 SF)	
3. Levee Removal and Modification		
4. Side Channel/Off Channel Habitat Restoration and Reconnection		
5. Salmonid Spawning Gravel Restoration	716 LF (5,728 SF)	
6. Forage Fish Spawning Gravel Restoration		
7. Hardened Fords and Fencing for Livestock Stream Crossings		
8. Irrigation Screen Installation and Replacement		
9. Debris and Structure Removal		

F. Description of the proposed work: [Describe the work to be accomplished including purpose, number and type of structures to be installed or constructed, construction materials and machinery to be used, and anticipated construction techniques to be employed. You may attach additional pages or, if completing this form by computer, expand the space below to provide this information. Attach maps or drawings to clearly illustrate the location, nature, and extent of the proposed work.]

The City of Sammamish is planning the Zackuse Creek Fish Passage Project. The project intends to improve fish passage and spawning habitat for native kokanee salmon in Zackuse

Creek. There are two components for this project. The first component will replace three partial fish passage concrete culverts with fish passable box culverts. The second project component is to restore and realign a portion of Zackuse Creek in order to create enhanced stream channel morphology that is better suited for kokanee spawning and rearing habitat. The project will improve fish passage within Zackuse Creek by improving fish access and increasing available aquatic habitat.

Culvert Removal

Three culverts are to be removed to allow for appropriate fish passable box culverts. The existing culverts will be removed after a temporary stream bypass is installed. Excavation for the new culverts will be completed in stages to facilitate traffic control and as new portions are excavated, the existing culverts will be removed. The removed culverts will be disposed of in an approved off-site facility.

Existing culverts will be removed using a combination of stream diversion, work isolation structures, pavement cutting, and equipment to lift out the existing culvert structures. Additional excavation of roadbed/trail material to accommodate the replacement culverts will occur using backhoes and excavators. Replacement culverts will be set into place using either cranes or backhoes. Repaving of the trail and roadways will be accomplished using typical roadway repaving and resurfacing equipment.

Stream channel construction: Zackuse Creek

The new stream alignment will be accomplished using backhoes and excavators to create the channel; dump trucks, backhoes, and bulldozers to backfill stream bed gravels and place large wood; and typical equipment and techniques to install restoration and enhancement plantings at the conclusion of the project.

G. Project timing:

Start date May 2018	Start Date In-water Work ? July 1, 2018
End date November 2018	End Date In-water Work ? August 15, 2018

H. Anticipated cubic feet per second (CFS) of stream at time of construction:

2-10 cfs.

I. How much area do you propose to clear for temporary access?

7,950 sq. ft.

J. How many trees and what sizes will be felled for temporary access?

35-60 trees—a combination of red alder, black cottonwood, and big leaf maple. All trees to be felled are less than 24 inches dbh.

K. Will your temporary access traverse across slopes steeper than 30%?

No.

L. How many temporary stream crossings do you propose? List all best management practices (BMPs) proposed to avoid and minimize impacts from stream crossings.

None.

M. Culvert replacements:

1. Append the applicable “Summary Form for Fish-Passage Design Data” that can be found in the WDFW Culvert Manual ((Bates et al. 2003) Appendix F).

See attached Culvert Sizing Memo.

2. Append maintenance plan that shows that culvert will be in design condition prior to each fish passage season.

A maintenance and monitoring plan to assess and document culvert design condition and fish passage is pending.

3. If your project is in gradients 6 – 10 % and a bridge is not feasible, use stream simulation option and provide annual monitoring data of substrate, invert elevation, and channel form (elements of roughened channel: boulders, pools, low flow channel) including a picture prior to each migration season.

Not applicable.

4. If your culvert is longer than 150 feet include tribal comments. If you discussed your design with WDFW, include WDFW comments or a record of your conversation with WDFW.

Not applicable.—Project culverts are not longer than 150 feet.

5. Are you increasing the amount of rip-rap. If so, by how much?

No.

6. Describe how proper ecological functions (bedload movement, debris movement, flood flows) in addition to fish passage will be met.

The replacement culverts have been sized using the WDFW stream simulation protocol, and will allow for sediment transport (bedload and washload), passage of debris, and will accommodate flows up to the 100-year event.

7. If you are increasing the length or width of a road:

- a. Quantify the increased impervious surface created as a result of this activity.

Temporary and permanent road widening is necessary to comply with safety standards for minor arterials. However, no increase in pollution-generating impervious surface will occur as a result of the project. No increase in future traffic loads, beyond what the roadway is currently predicted to experience, is anticipated as a result of the project. The permanent road widening is for an additional auxiliary lane for turning to improve traffic flow, reduce congestion, and improve vehicle safety along the travel corridor.

- b. List measures that you propose to use to avoid impacts to resources and water quality. Erosion control methods, best management practices will be used to reduce impacts to wetlands. The project will minimally impact wetlands due to culvert removals and replacement; the majority of this work will occur outside of the wetland in the road prism. Wetland impacts will further be minimized by clearly marking project boundaries to avoid unnecessary disturbance to the wetlands. Areas where vegetation is removed or disturbed will be replanted with native woody shrubs and reseeded.

Best Management Practices will be used to reduce impacts to waterbodies. Any storm water runoff from construction activities will be intercepted by installed temporary erosion and sediment control methods such as silt fencing. Spill containment measures will be properly implemented, monitored and maintained. Soil disturbances will be minimized to the maximum extent possible. Construction activities will occur during the dry season within WDFW's in-water work window. The project does not require any surface water or groundwater withdrawals and no water will be discharge to groundwater.

Note: Permanent road improvements that result in increased traffic or development are not permitted under this PBA.

N. Rock grade control structures: How much combined rock is proposed for structures?

A step-pool-run repeating bedform is proposed in the realigned and restored stream channel. Thirteen boulder bands along 530 linear feet of realigned stream will be spaced on average 41 feet apart for grade control. The equilibrium bed slope has been calculated at 1.6%, which is the gradient targeted for the pool tailouts and runs where ideal spawning habitats are anticipated to occur.

O. Removal or modification of sediment bars or terraces: Has there been previous removal of sediment at this location? If yes when and how much?

Not applicable. No sediment bars or terraces will be removed for this project. Approximately 317 cubic yards of material will be excavated and hauled away from the site to construct the new stream channel.

P. Side Channel/Off Channel Habitat Creation:

1. Has a reach assessment or analysis been conducted for this project?

- 2 How many years will the project take to complete?
3. Demonstrate sufficient hydrology for a self-sustaining channel.

Not applicable.

Q. Will you be isolating the work area? [Explain how your decision on working in the wet or dry, or partially isolation the area, will minimize impacts to salmonids.]

Zackuse Creek will be isolated from the construction area during the culvert replacements. A stream bypass pipe will be installed to bypass Zackuse Creek during the culvert replacement, and all in-water work will occur during WDFW-approved in-water work window.

The new stream channel will be constructed previous to or concurrently with the culvert replacements. Zackuse Creek will be allowed to flow in its current flow path until the new channel has been constructed and stabilized, and all construction of the new channel will be isolated from the existing channel until completion of the new channel. Zackuse Creek will be diverted into the new stream channel after the new culverts are in place, the stream bypass is removed, and the new channel has been constructed.

In order to limit turbidity during removal and replacement of the culverts, a silt curtain may be installed at mouth of Zackuse Creek along Lake Sammamish shoreline.

R. Give a maximum estimate for the duration and length of downstream turbidity impacts. The Services will use this estimate for giving you your take exemption. (During construction you will be monitoring downstream sedimentation every 20 min to verify/refine your given estimate.)

Downstream turbidity impacts will be limited by appropriate sediment and erosion control BMPs. In-water work will be limited to the approved in-water work window, anticipated to be July 1-August 15. Potential downstream turbidity impacts are not anticipated to extend beyond 100 feet downstream of the furthest downstream culvert replacement, based on anticipated flow rates in Zackuse Creek and established protocols for determining a point of compliance for stream systems of the size/flow rate of Zackuse Creek.

S. Explain what equipment will generate noise above ambient levels and for what period during the day and for how many days.

Per the WSDOT BA manual for determining impacts from construction generated noise, the ambient background noise level is determined to be 50 dBA based on the population density of the City of Sammamish. Traffic noise was determined to be 69.2 dBA. The site is divided between both soft and hard landscapes. Anticipated construction equipment includes excavators (81 dBA), backhoes (78 dBA), chainsaws (84 dBA), and dump trucks (76 dBA).

Construction noise attenuates to below traffic noise between 1600 and 3200 feet. Construction noise attenuates to below background noise for soft landscapes at approximately 1600 feet.

Noise generation above ambient levels is expected to last from project May 1, 2018 until November 30, 2018, during weekdays from approximately 8am to 6pm.

T. Please attach HPA or explain why you do not need one.

An HPA from WDFW will be required to authorize this project. Based on the nature of the proposed work, the project is anticipated to receive a fish enhancement HPA from WDFW.

U. If your project does not meet all of the criteria outlined in the PBA, but is a restoration action of similar scope and impacts, contact the Services with the project's description, conservation measures and reason(s) it may not currently fit under the PBA. Provide below any supporting conversations with NMFS and/or USFWS staff, including a list of the PBA criteria your project won't meet. This is a living document. We are continuously working on refining the proposed/covered actions and conservation measures.

II EFFECT DETERMINATIONS FOR FISH SPECIES USFWS & NMFS

Each project should have the appropriate effect determination. The PBA allows for No Effect (NE), Not Likely to Adversely Affect (NLAA), or Likely to Adversely Affect (LAA) determinations for listed species. Each determination must be adequately documented in this form. If you need assistance in determining the appropriate effect determination, consult the Corps, USFWS, and NMFS staff.

Check all currently listed evolutionarily significant units (ESUs) or Interim Recovery Units (IRUs) that may occur in the fifth field watershed where the project is located.

Endangered

- Upper Columbia River Spring-run Chinook (*Oncorhynchus tshawytscha*)
- Snake River Sockeye (*Oncorhynchus nerka*)
- Upper Columbia River Steelhead (*Oncorhynchus mykiss*)

Threatened

- Bull trout, Coastal/Puget Sound IRU (*Salvelinus confluentus*)
- Bull trout, Columbia River IRU (*Salvelinus confluentus*)
- Coho salmon, Lower Columbia River ESU (*O. kisutch*)
- Chinook salmon, Lower Columbia River ESU (*Oncorhynchus tshawytscha*)
- Chinook salmon, Puget Sound ESU (*Oncorhynchus tshawytscha*)
- Chinook salmon, Snake River Spring/Summer-run ESU (*Oncorhynchus tshawytscha*)
- Chinook salmon, Snake River Fall-run ESU (*Oncorhynchus tshawytscha*)
- Chum salmon, Columbia River ESU (*Oncorhynchus keta*)
- Chum salmon, Hood Canal summer ESU (*Oncorhynchus keta*)
- Steelhead trout, Lower Columbia River ESU (*Oncorhynchus mykiss*)
- Steelhead trout, Middle Columbia River ESU (*Oncorhynchus mykiss*)
- Steelhead trout, Coastal/Puget Sound DPS (*Oncorhynchus mykiss*)
- Steelhead trout, Snake River ESU (*Oncorhynchus mykiss*)

Designated

- Critical habitat for Coastal/Puget Sound bull trout IRU
- Critical habitat for Columbia River bull trout IRU
- Critical habitat for Columbia River chum salmon ESU
- Critical habitat for Hood Canal summer chum salmon ESU
- Critical habitat for Lower Columbia River Chinook salmon ESU
- Critical habitat for Upper Columbia River Spring-run Chinook salmon ESU
- Critical habitat for Snake River Spring/Summer-run Chinook salmon ESU
- Critical habitat for Snake River Fall-run Chinook salmon ESU
- Critical habitat for Puget Sound Chinook salmon ESU
- Critical habitat for Lower Columbia River steelhead trout ESU
- Critical habitat for Upper Columbia River steelhead trout ESU

- Critical habitat for Middle Columbia River steelhead trout ESU
- Critical habitat for Snake River steelhead trout ESU

Lake Ozette Sockeye salmon are not covered by this programmatic at this time.

Directions: Use the Notes section under each question to document your rational and decision making process for presence or absence of the fish, and the effect determination.

FILL OUT THIS SECTION FOR EACH INDIVIDUAL ESU THAT OCCURS IN THE FIFTH FIELD WATERSHED

Effect Determination by Species: NE

ESU and critical habitat: Puget Sound Chinook Salmon ESU. No critical habitat for any federally listed salmonid species occurs within the fifth field watershed.

1) Is the project in a fifth - field watershed that contains or has the potential to contain (insert species) Puget Sound Chinook Salmon ESU

YES If yes, list fifth field watershed, and go to question 2.

Fifth-field watershed: HUC 1711001202 --Lake Sammamish

NO If no, the project will have “No Effect” on (insert species). Go to question 5. Notes:

2) Do the stream(s) in which impacts may occur contain suitable habitat for Puget Sound Chinook Salmon ESU ?

For bull trout use Tables 1 & 2 of Appendix A and/or the draft recovery plans (available at: <http://www.fws.gov/pacific/bulltrout/recovery.html>) and a distribution map the USFWS posted at <http://www.fws.gov/westwafwo/index.html> to determine if your project is within critical habitat for bull trout.

For other salmon you may use the NMFS critical habitat web page at <http://www.nwr.noaa.gov/Salmon-Habitat/Critical-Habitat/CH-Maps.cfm> determine if your project is within critical habitat.

YES If yes, what type of habitat is present? Spawning Rearing Migratory Corridor Not known Go to Question 3.

NO If no, the project will have “No Effect” on . Go to question 5.

Notes

3) Approximately how far is the project from the nearest suitable habitat (in river miles, upstream or downstream) for

Go to question 4.

Notes: _____

4) Does the proposed activity have the potential to alter or affect the following indicators: temperature, sediment, chemical contamination/nutrients, physical barriers, substrate embeddedness, large woody debris, pool frequency, pool quality, off-channel habitat, refugia, wetted width/depth ratio, streambank condition, floodplain connectivity, peak/base flows, drainage network, disturbance history, function of riparian reserves, or disturbance regime?

YES ____ If yes, briefly explain which habitat elements will be affected and indicate if the effects will be short term or long-term. For example, many activities will have increased levels of turbidity during project implementation, but are expected to result in long-term improvements to the target indicators. _____

NO X If no, the project will have “No Effect” on (insert species). Go to question 4.

Notes: _____

5) Provide rationale for effect determination. _

1. Zackuse Creek currently does not contain suitable habitat for Puget Sound Chinook salmon.
2. Due to stream size, substrate, and general habitat conditions, Zackuse Creek does not have suitable habitat for in-migrating adult Chinook salmon (Parametrix, 2007).
3. Though the creek has the potential to contain juvenile Chinook salmon, rearing habitat for juveniles is not accessible due to fish blocking barriers.
4. Project construction will occur during summer months when modeled presence of salmonid species is at its lowest.

Effect Determination: (insert effect determination) No Effect. (insert species) Puget Sound Chinook Salmon

Note: If you are dewatering an area, electroshocking in an area, or are doing major in-water work where listed salmonids are likely to be present during the work window, you will probably have a LAA effect determination.

FILL OUT THIS SECTION FOR EACH INDIVIDUAL ESU THAT OCCURS IN THE FIFTH FIELD WATERSHED

Effect Determination by Species: NE

ESU and critical habitat: Coastal/Puget Sound steelhead salmon DPS. No critical habitat for any federally listed salmonid species occurs within the fifth field watershed.

1) Is the project in a fifth - field watershed that contains or has the potential to contain (insert species) Coastal/ Puget Sound steelhead salmon DPS?

YES X If yes, list fifth field watershed, and go to question 2.

Fifth-field watershed: HUC 1711001202 --Lake Sammamish

NO If no, the project will have “No Effect” on (insert species). Go to question 5. Notes:

2a) Do the stream(s) in which impacts may occur contain suitable habitat for Puget Sound steelhead salmon DPS ?

For bull trout use Tables 1 & 2 of Appendix A and/or the draft recovery plans (available at: <http://www.fws.gov/pacific/bulltrout/recovery.html>) and a distribution map the USFWS posted at <http://www.fws.gov/westwafwo/index.html> to determine if your project is within critical habitat for bull trout.

For other salmon you may use the NMFS critical habitat web page at <http://www.nwr.noaa.gov/Salmon-Habitat/Critical-Habitat/CH-Maps.cfm> determine if your project is within critical habitat.

YES If yes, what type of habitat is present? Spawning Rearing Migratory Corridor Not known Go to Question 3.

NO X If no, the project will have “No Effect” on . Go to question 5.

Notes

3) Approximately how far is the project from the nearest suitable habitat (in river miles, upstream or downstream) for

Go to question 4.

Notes: _____

4) Does the proposed activity have the potential to alter or affect the following indicators: temperature, sediment, chemical contamination/nutrients, physical barriers, substrate embeddedness, large woody debris, pool frequency, pool quality, off-channel habitat, refugia, wetted width/depth

ratio, streambank condition, floodplain connectivity, peak/base flows, drainage network, disturbance history, function of riparian reserves, or disturbance regime?

YES If yes, briefly explain which habitat elements will be affected and indicate if the effects will be short term or long-term. For example, many activities will have increased levels of turbidity during project implementation, but are expected to result in long-term improvements to the target indicators. _____

NO If no, the project will have “No Effect” on (insert species). Go to question 4.

Notes: _____

5) Provide rationale for effect determination

1. Zackuse Creek currently does not contain suitable habitat for Coastal/Puget Sound steelhead salmon.
2. Due to stream size, substrate, and general habitat conditions, Zackuse Creek does not have suitable habitat for in-migrating adult steelhead salmon (Parametrix, 2007).
3. Though the creek has the potential to contain juvenile steelhead salmon, rearing habitat for juveniles is not accessible due to fish blocking barriers.
4. Project construction will occur during summer months when presence of salmonid species is at its lowest.

Effect Determination: (insert effect determination) No Effect. (insert species) Coastal/ Puget Sound steelhead salmon

Note: If you are dewatering an area, electroshocking in an area, or are doing major in-water work where listed salmonids are likely to be present during the work window, you will probably have a LAA effect determination.

III EFFECT DETERMINATIONS FOR LISTED TERRESTRIAL SPECIES

1. To determine which listed species may occur in the project area follow the steps below:
 - a. Obtain a county species list from the USFWS web page.
http://www.fws.gov/westwafwo/se/SE_List/Endangered_Species.asp
<http://www.fws.gov/easternwashington/county%20species%20lists.htm>
 - b. Site-specific information of listed species occurrences in Washington State may be obtained from the Washington Department of Fish and Wildlife Priority Habitat and Species Program <http://www.wdfw.wa.gov/hab/phspage.htm> and from the Washington Department of Natural Resources Natural Heritage Program at <http://www.dnr.wa.gov/nhp/>.
 - c. Remove species from the species list when habitat is not available for the species in the project area or “vicinity of activity” (generally 1 mile radius around the project site. The area that may be affected by any project impacts including noise and turbidity.)

2. When filling out the information below consider:

Each project should have the appropriate effect determination. The PBA allows for NE or NLTAA determinations for terrestrial species, and NE, NLTAA or LTAA for aquatic species. Each determination must be adequately documented in this form. If you need assistance in determining the appropriate effect determination, request help from a Corps ESA Coordinator or the USFWS. The USFWS contact is Tom McDowell at 360-753-9426.

 - a. For information on species biology, range and critical habitat use the USFWS web site: <http://www.fws.gov/westwafwo/index.html>
 - b. Conservation Measures are listed in Appendix B
 - c. If you do not implement all conservation measures related to the species present please explain.

LISTED TERRESTRIAL SPECIES

Please refer to the PBA for actions that may affect these species and conservation measures to protect terrestrial species. For information on the listed terrestrial and aquatic species that occur in Washington, visit the following website: ecos.fws.gov or contact the following FWS field offices:

Western Washington Office in Lacey:	(360) 753-6044	John Grettenberger
Central Washington Office in Wenatchee:	(509) 665-3508	Jessica Gonzales
Eastern Washington office in Spokane:	(509) 891-6839	Suzanne Audet

COASTAL ECOSYSTEMS – Not Applicable

Listed Species: Brown Pelican (*Pelecanus occidentalis*), Oregon silverspot butterfly (*Speyeria zerene hippolyta*), and Snowy Plover (*Charadrius alexandrinus nivosus*):

- a) Will the activity occur in Grays Harbor, Wahkiakum, Pacific, Jefferson or Clallam Counties?
 No Put NE under “Effect Determination” for these three coastal species.
Yes If yes go to b)

b) Will the activity alter sand islands or coastal dunes and meadows in Grays Harbor or Pacific County?

No Yes

If yes, contact the FWS office in Lacey for coordination.

c) Conservation Measures to be applied:

d) Effect Determination for coastal species and rationale: **NE** for all three coastal species listed above. The project does not take place in Grays Harbor, Wahkiakum, Pacific, Jefferson or Clallam Counties and there is no exposure of the listed coastal species to project effects.

LOWER COLUMBIA –Not Applicable

Listed species: Columbian white-tailed deer (*Odocoileus virginianus leucurus*)

a) Will the activity occur on islands or in the floodplain of the lower Columbia River (Wahkiakum and Cowlitz Counties) and include installing fence?

No Yes

If yes, apply conservation measures for the Columbian white-tailed deer

b) Effect Determination and rationale: **NE**. The project does not take place on islands or in the floodplain of the lower Columbia River, nor does it include installing fence. There is no exposure of the Columbian white-tailed deer to project effects.

CARNIVORES and CARIBOU –Not Applicable

1. Gray Wolf (*Canis lupus*) – The range of the grey wolf includes the Blue Mountains, northeast Washington (Rocky Mountains) and the Cascade Mountains. There are no confirmed records of wolves west of the Cascade Crest and no documented den sites in the state.

2. Grizzly Bear (*Ursus arctus horribillus*) – The grizzly bear recovery plan identifies high alpine areas in the North Cascades (north of Interstate 90 to the Canadian border) as important for recovery of this species in Washington.

3. Canada lynx (*Lynx Canadensis*) - This species occurs in high elevation forests (generally above 4,000 feet) in the North Cascades and northeast Washington.

4. The woodland caribou (*Rangifer tarandus caribou*) occurs in high elevation forests (generally above 4,000 feet) in northeast Washington (Pend Oreille County).

a) Will the activity be conducted in or near mountain meadows or forest openings, high elevation forests, or ungulate wintering or calving sites in the geographic areas where these listed species may occur?

No Yes

If yes, apply the appropriate seasonal restrictions identified in the PBA to minimize disturbance

If you do not know whether your project will affect suitable habitat or feeding areas for these species, please contact the USFWS office in Spokane.

a) Effect Determination for these species and rationale. Document any supporting conversations with USFWS staff: **NE**. The project does not occur in the geographic areas where these listed species may occur and there is no exposure of these species to project effects.

Pygmy rabbit (*Brachylagus idahoensis*)

1. The pygmy rabbit historically was found in dense, tall sagebrush areas east of the Columbia River (Douglas, Adams, Lincoln, Grant and Benton Counties).

a) Will the activity occur in native sagebrush areas of the central Columbia Plateau?
 No Put NE under “Effect Determination” and proceed to next species.
Yes If yes, contact the USFWS.

d) Effect Determination and rationale: **NE**. The project does not occur in the geographic areas where pygmy rabbits may occur and there is no exposure of these species to project effects.

MATURE FORESTS in the CASCADE and OLYMPIC MOUNTAINS:

Marbled Murrelet (*Brachyramphus marmoratus*)

For information on the marbled murrelet, see <http://www.fws.gov/pacific/marbledmurrelet/index.html>

a) Are you within 50 miles of marine water?
No Put NE under “Effect Determination” and proceed to next species Yes

b) Is there suitable habitat (mature conifer-dominated forests over 80 years old) within 200 feet of the project vicinity?
 No Yes Not known

c) Will the activity generate noise above ambient levels within 200 feet (1.0 mile if blasting, low-elevation aircraft operations, or pile driving) of potential suitable nesting habitat?
 No Yes If yes, apply conservation measures to minimize disturbance.

d) Does the activity include low elevation operation of aircraft, pile driving, or blasting within 1 mile of suitable or occupied nesting or foraging habitat?
 No Yes If yes, apply seasonal restrictions to minimize disturbance.

Activities in the marine environment that include pile driving or blasting may need to go through individual consultation. Contact the USFWS office in Lacey for specific restrictions related to underwater sound in marine areas.

e) Will the project affect suitable nesting habitat or designated critical for marbled murrelets? Activities that remove or kill trees with suitable platforms, remove suitable platforms, or reduce the suitability of the stand as nesting habitat are not covered under this PBA. No.

f) Notes:

g) Conservation Measures to be applied: None.

h) Effect Determination and rationale: **NE**. The majority of the site consists of single family homes and a large palustrine scrub shrub and forested wetland. No suitable nesting or foraging habitat for marbled murrelets occurs in the vicinity of the project and there will be no exposure of breeding or foraging individuals of this species to project effects.

Northern spotted owl (*Strix occidentalis caurina*)

For information, including critical habitat designation see

<http://ecos.fws.gov/speciesProfile/SpeciesReport.do?scode=B08B>

a) Is there suitable habitat (mature conifer forests over 80 years old) within 200 feet of the project vicinity?

No Put NE under "Effect Determination" and proceed to next species

Yes Not known

b) What type of forest habitat is present in the vicinity of the activity?

nesting or foraging habitat dispersal habitat designated critical habitat

None

d) Will the activity occur in nesting or foraging habitat?

No Yes If yes, apply seasonal operating restrictions to minimize disturbance.

e) Will the activity generate above ambient noise within 200 feet (1.0 mile if blasting, pile driving or aircraft operations) of suitable nesting habitat?

No Yes If yes, apply seasonal restrictions.

f) Will the activity occur in or remove trees from spotted owl designated critical habitat?

No Yes If yes, explain how/if this will affect the function of the stand.

g) Notes:

h) Conservation Measures to be applied: None.

i) Effect Determination for northern spotted owls: **NE**. Suitable habitat is not available.

Effect Determination for designated critical habitat for the northern spotted owl: **NE**. Project site is not within designated critical habitat for the northern spotted owl.

Listed Plants:

No herbicide use, mechanical vegetation management, or construction activities are permitted in areas that could support listed plants under this programmatic.

Information on these species can be found at: <http://ecos.fws.gov>, the Washington Department of Fish and Wildlife Priority Habitat and Species Program at (360)-902-2543 or their website at www.wdfw.wa.gov/hab/phspage.htm, or the Washington Department of Natural Resources Natural Heritage Program at (360) 902-1667 or their website at www.dnr.wa.gov/nhp/.

1. *Hackelia venusta* (**showy stickseed**) this species occurs in Chelan County, between 984 and 1,600 feet in elevation, in the Ponderosa Pine zone
2. *Lomatium bradshawii* (**Bradshaw's desert-parsley**) – this species occurs in wetlands, prairies and grasslands in Clark County
3. *Sidalcea oregana* var. *calva* (**Wenatchee Mountains checker-mallow**) - this species is found in the Peshastin Creek watersheds in Chelan County. Information on critical habitat for this species can be found at: http://ecos.fws.gov/docs/federal_register/fr3793.pdf
4. *Castilleja levisecta* (**golden paintbrush**) - this plant occurs in Island, San Juan, and Thurston Counties and is found in open grasslands, prairies, and grass dominated coastal bluffs.
5. *Howellia aquatilis* (**water howellia**) – this aquatic plant is found in and around seasonal wetlands in Mason, Pierce, Thurston, Clark, and Spokane Counties.
6. *Lupinus sulphureus* ssp. *kincaidii* (**Kincaids lupine**) - this plant occurs near Boistfort, Lewis County in native upland prairie habitat.
7. *Sidalcea nelsoniana* (**Nelson's checkermallow**)- this plant is found in wetlands, stream corridors, or wet prairies in Lewis or Cowlitz Counties.
8. *Silene spaldingii* (**Spalding's silene/catchfly**)– this plant is also associated with native prairies and occurs in Asotin, Lincoln, Spokane, and Whitman Counties.
9. *Spiranthes diluvialis* (**Ute ladies'-tresses**) – this plant grows on the margins of springs, wet meadows, floodplains, and riparian areas in Okanagon and Grant County

Please document conversations with USFWS staff and provide adequate information on botanical surveys and/or habitat analysis to support your effect determination.

Effect determination for listed plants: **NE**. None of the above species are listed as occurring in the project county (King). No critical habitat for listed species occurs within the project site. The project site includes a palustrine scrub-shrub and forested wetland, which may provide potential habitat for water howellia, Nelson's checkermallow and Ute ladies'-tresses. However these species are not known

to be present within King County, and therefore there will be no exposure of listed plant species to project effects.

IV SIGNATURE

I hereby verify that this work will comply with all applicable requirements of the above-referenced Biological Opinion should a Department of the Army authorization be issued for this work.

Certain categories of activities require the permittee to submit post construction reports to the Corps and/or the Services. These reports are identified in the PBA. For projects deviating from PBA criteria, the Services may require additional post-construction reporting. These additional reports will be clearly identified and agreed upon by the Services and applicant during the coordination process. By signing this form, the applicant agrees to submit within the required time frame all applicable post-construction reports.

Signature of Applicant: _____ Date: _____

Signature of Agent: _____ Date: _____

APPENDIX A: DEWATERING AND FISH CAPTURE PROTOCOL

Work to facilitate habitat restoration may occur in isolation from flowing waters or in flowing water depending on site conditions to minimize impacts to salmonids.

If bull trout or other listed salmonids could be present in the vicinity of the project use the following dichotomous key to determine which dewatering protocol and timing window you need to implement for your project. This key references information within the *Draft Recovery Plan for the Coastal-Puget Sound Distinct Population Segment of Bull Trout Volumes I and II* (USFWS 2004a; USFWS 2004b), and the *Draft Recovery Plan for the Columbia River Distinct Population Segment of Bull Trout* (USFWS 2002). <http://www.fws.gov/pacific/bulltrout/recovery.html>. If you have questions, contact the USFWS.

1. Is the project located within a documented or potential bull trout Local Population Area that is excluded from coverage under this programmatic consultation (see Table 1)?
 - a. Yes – Dewatering in a documented or potential bull trout Local Population Area in eastern Washington is not covered under this programmatic consultation. Complete an individual section 7 consultation for the project. Please contact the USFWS office in Spokane or Wenatchee for assistance.
 - b. No – go to 2

2. Is the project located within a water body where any listed salmonids are likely to be present? For specific bull trout areas where projects are permitted see Table 2.
 - a. Yes – go to 3
 - b. No - use “Protocol for Dewatering Outside High Likelihood Listed Fish Areas”;

3. Is the stream flow at the time of project construction anticipated to be greater than or equal to 5 cubic feet per second **and** is the dewatered stream length (not including the culvert and plunge pool length, if present) greater than or equal to 33 ft?
 - a. No - use “Protocol for Dewatering Outside High Likelihood Listed Fish Areas”;
 - b. Yes - use “Protocol I Dewatering Within High Likelihood Listed Fish Areas”;and consult with a USFWS bull trout biologist staff on appropriate timing window.

Table 1: Bull Trout Spawning and Rearing Areas that are Excluded from the Programmatic¹
 (Listed in order of WRIA number)

Management or Recovery Unit	Core Area	Spawning and Rearing Areas Excluded (no in-water work is permitted in these areas)
Umatilla-Walla Walla River Basin	Walla Walla Core Area WRIA 32	Mill Creek and tributaries
		Wolf Fork above Coates Creek
		N Fk Touchet and tributaries upstream of Wolf Fk confluence
		S Fk Touchet River and tributaries above Griffin Creek
Snake River Basin	Asotin Creek	N Fk Asotin Creek including Charley and Cougar Creeks – above confluence with Charley Cr
	Tucannon River WRIA 35	Tucannon River from confluence with Little Tucannon Upper Tucannon River and tributaries above confluence with Hixon Creek Cummings Creek
Middle Columbia River Basin	Yakima River Core Area	WRIA 37 N and MFk Ahtanum Creek - above the confluence of S Fk S Fk Ahtanum Creek – above confluence with N Fk Ahtanum
		WRIA 38 Rattlesnake Creek – upstream of confluence with Naches River
		WRIA 39 Taneum Creek – upstream of Taneum Campground Upper Yakima – upstream of Lake Easton Dam Cle Elum River – upstream of confluence with Yakima River N Fk Teanaway – upstream of confluence with Yakima River
Upper Columbia River Basin	Wenatchee River Core Area WRIA 45	Upper Wenatchee and tributaries above confluence with the Chiwawa, including Nason Cr, Little Wenatchee, White and the Chiwawa Rivers
		Chiwaukum Creek and Icicle Creek– upstream from confluence with the Wenatchee River
		Ingalls Creek- upstream of confluence with Peshastin Creek
	Entiat River Core Area WRIA 46	Entiat River – above confluence with the Mad River
		Mad River – above confluence with Entiat River
	Methow River Core Area WRIA 48	Upper Methow tributaries - Lost River, Early Winters Cr, W Fk Methow, Goat Cr, and Wolf Cr Chewack River – upstream of Twentymile Cr
		Twisp River and tributaries above confluence of, and including, Little Bridge Creek
		Gold Cr – upstream of confluence with Methow River
Northeast Washington	Pend Oreille River WRIA 62	Le Clerc Creek – upstream of mouth

¹ Spawning and rearing areas on lands administered by the U.S. Forest Service or Bureau of Land Management are not listed because these lands are not included in this Programmatic

Table 2 List of streams and marine areas that important for bull trout recovery where in-water work is permitted

Management Unit	Bull Trout Areas
<p>Olympic Peninsula - Marine</p>	<p>Hood Canal and independent tributaries</p> <p>Strait of Juan de Fuca and independent tributaries (includes Bell, Morse, Ennis, Siebert Creeks)</p> <p>Pacific Ocean and independent coastal tributaries (includes Goodman, Mosquito, Cedar, Steamboat, Kalaloch and Joe Creeks, Raft, Moclips and Copalis Rivers)</p> <p>Lower Chehalis River/Grays Harbor and independent Tributaries (includes Humptulips, Wishkah, Wynoochee and Satsop Rivers)</p>
<p>Olympic Peninsula - Freshwater</p>	<p>Dungeness River – mouth to RM 10</p> <p>Skokomish River – mouth to head of Cushman Reservoir</p> <p>Hoh River – mouth to headwaters</p> <p>Queets River – mouth to headwaters</p> <p>Quinault River - mouth to headwaters</p>
<p>Puget Sound - Marine</p>	<p>All marine shorelines including North Puget Sound, Main Basin, Whidbey Basin, and South Puget Sound</p>
<p>Puget Sound - Freshwater</p>	<p>Samish River, Whatcom Creek, Squalicum Creek, Duwamish and lower Green River, and Lower Nisqually River including the Nisqually River estuary and McAllister Creek (FMO areas outside of core areas)</p> <p>Lake Washington including the following: lower Cedar River; Sammamish River; Lakes Washington, Sammamish, and Union; and Ship Canal</p> <p>Nooksack River – mouth to National Forest boundary (North and South Forks)</p> <p>Skagit River – mouth to National Forest boundary</p> <p>Stillaguamish River – mouth to headwaters of N Fork; Deer Creek – mouth to National Forest boundary; S Fork and Canyon Cr – mouth to National Forest boundary</p> <p>Snohomish/Skykomish – mouth to confluence of Skykomish and Snoqualmie Rivers; Pilchuck River; Snoqualmie River to falls; Tolt River; Skykomish River – mouth to National Forest boundary, including Sultan River, Woods Creek and Wallace River; S Fk Skykomish to National Forest boundary</p> <p>Puyallup River – mouth, including Mowich River, to National Park boundary;</p> <p>Carbon River – mouth to National Forest boundary;</p> <p>White River – mouth to National Forest boundary</p>

Management Unit	Bull Trout Areas
Lower Columbia	Lewis River – mouth to RM 75 (Upper Falls), including Swift, Yale, and Mervin Reservoirs Klickitat River – mouth to confluence of W FK Klickitat
	Mainstems of the Columbia, Snake, Walla Walla, Pend Oreille, and Grande Ronde Rivers
Middle Columbia River Basin	Ahtanum Creek – mouth to confluence of N and S Forks Naches River – mouth to confluence of Little Naches and Bumping River Tieton River – mouth to Rimrock Lake Yakima River – mouth to Easton (RM 203) and Teanaway River
Upper Columbia River Basin	Wenatchee River – mouth to confluence of the Chiwawa; Peshastin Cr – mouth to confluence of Ingalls Cr; Chewack River – confluence with Wenatchee to RM 20; Beaver Cr – mouth to Blue Buck Cr Entiat River – mouth to confluence with Mad River Methow River – mouth to confluence of Lost River
Northeast Washington Pend Oreille River	Pend Oreille River; Tacoma Cr - mouth to Little Tacoma; Small Creek – mouth to forks; Sullivan Creek to and including Sullivan Lake
Walla Walla River Basin	Touchet River – mouth to forks; S Fk Touchet River – to confluence of Griffin Cr N Fk Touchet to Wolf Fork; Wolf Fork to confluence of Coates Cr Mill Creek and tributaries
Snake River Basin	Mainstem Snake and Grande Ronde Rivers ; Asotin Creek – mouth to confluence of N Fk Asotin and Charley Cr; Tucannon River – mouth to confluence of Hixon Cr

Protocol I Dewatering Within High Likelihood Listed Fish Areas

A. Fish Capture – General Guidelines

1. Fish Capture Methods
 - a. Minnow traps. Optional. Traps may be left in place prior to dewatering and may be used in conjunction with seining. Once dewatering starts, minnow traps should only be used if there is someone present to check the traps every few hours, and remove the traps once the water level becomes too low.
 - b. Seining. Required. Use seine with mesh of a size to ensure entrapment of the residing ESA-listed fish and age classes.
 - c. Sanctuary dip nets. Required. Use in conjunction with other methods as area is dewatered.
 - d. Electrofishing. Optional. Use electrofishing only after other means of fish capture have been exhausted or where other means of fish capture are not be feasible. Applicants shall adhere to NMFS Backpack Electrofishing Guidelines (NMFS 2000).
2. Fish capture operations will be conducted by or under the supervision of a fishery biologist experienced in such efforts and all staff working with the capture operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.
3. The applicant must obtain any other Federal, State and local permits and authorizations necessary for the conduct of fish capture activities.
4. A description of any capture and release effort will be included in a post-project report, including the name and address of the supervisory fish biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers; the means of fish removal; the number and size of fish removed by species and age class; condition upon release of all fish handled; and any incidence of observed injury or mortality.
5. Storage and Release. ESA-listed fish must be handled with extreme care and kept in water at all times during transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, whenever necessary to prevent the added stress of an out-of-water transfer. A healthy environment for non-ESA listed fish shall be provided by large buckets (five gallon minimum to prevent overcrowding) and minimal handling of fish. The water temperature in the transfer buckets shall not exceed the temperature of cold pool water in the subject stream. Retain fish the minimum time possible to ensure that stress is minimized, temperatures do not rise, and dissolved oxygen remains suitable. Release fish as near as possible to the isolated reach in a pool or area that provides cover and flow refuge.

B. Dewater Instream Work Area and Fish Capture

Fish screen. Except for gravity diversions that have gradual and small outfall drops directly into water, all water intake structures must have a fish screen installed, operated, and maintained in accordance with NMFS Guidelines (NMFS 1997; Chapter 11 in NMFS 2008).

The sequence for stream flow diversion will be:

Note: this sequence will take one 24-hour period prior to construction to complete (of which 12 hours are for staged dewatering with 6 hours overnight). We suggest you start in the morning the day before project construction is scheduled and leave the reach dewatered overnight according to instruction below.

1. Install flow conveyance devices (pumps, discharge lines, gravity drain lines, conduits, and channels), but do not divert flow.
2. Install upstream barrier. Allow water to flow over upstream barrier.
3. Install block net at upstream end of work area. Block nets will be checked every 4 hours, 24 hours a day. If any fish are impinged or killed on the nets they will be checked hourly.
4. Reduce flow over upstream barrier by one-third for a minimum of 6 hours.
5. Inspect as discharge is diminishing and in dewatered areas for stranded and trapped fish and remove them with sanctuary dip nets.
6. Reduce flow over upstream barrier by an additional one-third for a minimum of 6 hours.
7. Again, inspect dewatered areas for stranded and trapped fish and remove them with sanctuary dip nets.
8. Leave the project area in a stable, low flow (one third of flow) condition, overnight, allowing fish to leave the area volitionally.
9. In the morning, remove any remaining fish from the area to be dewatered using seines and/or hand held sanctuary dip-nets.
10. Divert upstream flow completely.
11. Install downstream barrier if necessary (only in low gradient, backwatered reaches).
12. If water remains within the work area; seine, dip net, and lastly electrofish (if using this technique), the project area until catch rates have reached no fish for 3 consecutive passes. Move rocks as needed to flush fish and effectively electrofish the work area.
13. If needed, pump water out of isolated pools within the project area to a temporary storage and treatment site or into upland areas and filter through vegetation prior to reentering the stream channel. Continue to seine, dip net and electrofish while pumping.
14. If fish continue to be captured, shut pump off before average water depths reach one foot. Continue to seine, dip net and electrofish until no fish are caught for 3 consecutive passes.
15. Pump dry and check substrate for remaining fish.
16. Continue to pump water from the project area as needed for the duration of the project.

The diversion structure is typically a temporary dam built just upstream of the project site with sand bags that are filled with clean gravel or stream/floodplain rock and covered with plastic sheeting. A portable bladder dam or other non-erosive diversion technologies may be used to contain stream flow. Mining of stream or floodplain rock can be used for diversion dam construction if it does not result in significant additional floodplain or stream disturbance. Often gravel has to be moved to key in logs in which case it makes sense to use this gravel for the diversion structure.

The temporary bypass system must consist of non-erosive techniques, such as a pipe or a plastic-lined channel, both of which must be sized large enough to accommodate the predicted peak flow rate during construction. In cases of channel rerouting, water can be diverted to one side of the existing channel.

Dissipate flow at the outfall of the bypass system to diffuse erosive energy of the flow. Place the outflow in an area that minimizes or prevents damage to riparian vegetation. If the diversion inlet is a gravity diversion and is not screened to allow for downstream passage of fish, place diversion outlet in a location that facilitates gradual and safe reentry of fish into the stream channel.

C. Rewater Instream Work Area

Remove stream diversion and restore stream flow. Heavy machinery operating from the bank may be used to aid in removal of diversion structures. Slowly re-water the construction site to prevent loss of surface water downstream as the construction site streambed absorbs water and to prevent a sudden increase in stream turbidity. Look downstream during re-watering to prevent stranding of aquatic organisms below the construction site.

All stream diversion devices, equipment, pipe, and conduits will be removed and disturbed soil and vegetation will be restored after the diversion is no longer needed.

Protocol II Dewatering Outside High Likelihood Listed Fish Areas

If bull trout or other listed salmonids are captured at any time during the dewatering process, immediately notify a USFWS bull trout biologist or NMFS biologist and obtain guidance to either continue to dewater and remove fish or stop activities and re-water the project site.

Normal guidance:

1. If you encounter listed fish at or prior to step 3 switch to Protocol I
2. If you encounter listed fish after step 3, continue to dewater and remove fish, paying close attention to presence of additional listed salmonids.

A. Fish Capture – General Guidelines

1. Fish Capture Methods
 - a. Minnow traps. Optional. Traps may be left in place prior to dewatering and may be used in conjunction with seining. Once dewatering starts, minnow traps should only be used if there is someone present to check the traps every few hours, and remove the traps once the water level becomes too low.
 - b. Seining. Required. Use seine with mesh of such a size to ensure entrapment of the residing ESA-listed fish and age classes.
 - c. Sanctuary dip nets. Required. Use in conjunction with other methods as area is dewatered.
 - d. Electrofishing. Optional. Use electrofishing only after other means of fish capture have been exhausted or where other means of fish capture are not be feasible. Applicants shall adhere to NMFS Backpack Electrofishing Guidelines.
2. Fish capture operations will be conducted by or under the supervision of a fishery biologist experienced in such efforts and all staff working with the seining operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.
3. The applicant must obtain any other Federal, State and local permits and authorizations necessary for the conduct of fish capture activities.
4. A description of any seine and release effort will be included in a post-project report, including the name and address of the supervisory fish biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers; the means of fish removal; the number and size of fish removed by species; conditions upon release of all fish handled; and any incidence of observed injury or mortality.
5. Storage and Release. Fish must be handled with extreme care and kept in water to the maximum extent possible during transfer procedures. A healthy environment for the stressed fish shall be provided by large buckets (five gallon minimum to prevent overcrowding) and minimal handling of fish. The temperature of the water shall not exceed the temperature in large deep holding pools of the subject system. The transfer of any ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, to prevent the added stress of

an out-of-water transfer. Retain fish the minimum time possible to ensure that stress is minimized, temperatures do not rise, and dissolved oxygen remains suitable. Release fish as near as possible to the isolated reach in a pool or area that provides cover and flow refuge.

B. Dewater Instream Work Area and Fish Capture

Fish screen. Except for gravity diversions that have gradual and small outfall drops directly into water, all water intake structures must have a fish screen installed, operated, and maintained in accordance with the NMFS Guidelines (NMFS 1997; Chapter 11 in NMFS 2008).

The sequence for stream flow diversion would be as follows:

1. Install flow conveyance devices (pumps, discharge lines, gravity drain lines, conduits, and channels), but do not divert flow.
2. Install block net at upstream end of work area.
3. Seine and dip net through the entire project area in a downstream direction, starting at the upstream end; thereby moving fish out of the project area. Then, if necessary electrofish.
4. Install upstream barrier and divert upstream flow completely.
5. Capture any remaining fish using hand held dip-nets.
6. Install downstream barrier if necessary (only in low gradient backwatered reaches).
7. If water remains within the work area; seine and dip net, if necessary electrofish the project area until catch rates have reached no fish for 3 consecutive passes.
8. Pump water out of isolated pools within the project area to a temporary storage and treatment site or into upland areas and filter through vegetation prior to re-entering the stream channel. Continue to seine, dip net, or electrofish while pumping.
9. If fish continue to be captured, shut pump off before average water depths reach one foot. Continue to seine, dip net, or electrofish until no fish are caught for 3 consecutive passes.
10. Pump dry and check substrate for remaining fish and remove them.
11. Continue to pump water from the project area as needed for the duration of the project.

The diversion structure is typically a temporary dam built just upstream of the project site with sand bags that are filled with clean gravel or stream/floodplain rock and covered with plastic sheeting. A portable bladder dam or other non-erosive diversion technologies may be used to contain stream flow. Mining of stream or floodplain rock can be used for diversion dam construction if it does not result in significant additional floodplain or stream disturbance. Often gravel has to be moved to key in logs in which case it makes sense to use this gravel for the diversion structure.

The temporary bypass system must consist of non-erosive techniques, such as a pipe or a plastic-lined channel, both of which must be sized large enough to accommodate the predicted peak flow rate during construction. In cases of channel rerouting, water can be diverted to one side of the existing channel.

Dissipate flow at the outfall of the bypass system to diffuse erosive energy of the flow. Place the outflow in an area that minimizes or prevents damage to riparian vegetation. If the diversion inlet is a gravity diversion and is not screened to allow for downstream passage of fish, place diversion outlet in a location that facilitates gradual and safe reentry of fish into the stream channel.

C. Rewater Instream Work Area

Remove stream diversion and restore stream flow. Heavy machinery operating from the bank may be used to aid in removal of diversion structures. Slowly re-water the construction site to prevent loss of surface water downstream as the construction site streambed absorbs water and to prevent a sudden increase in stream turbidity. Look downstream during re-watering to prevent stranding of aquatic organisms below the construction site.

All stream diversion devices, equipment, pipe, and conduits will be removed and disturbed soil and vegetation will be restored after the diversion is no longer needed.

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