

PART 3

**Additional Resources for Biological Assessment
Authors**

18.0 Gathering Information for a Biological Assessment

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18.0 Gathering Information for a Biological Assessment

This chapter provides contact information for the necessary information requests made as one of the first steps in preparing a biological assessment. Examples of information request letters are also included.

The local agency environmental classification summary (ECS) form is also included here, followed by the Endangered Species Act stormwater design checklist. These forms are filled in with project information that the BA preparer needs in order to develop the BA.

18.1 Information Request Contacts and Letter Samples

Information on threatened, endangered, proposed, and candidate species, including species of concern should be acquired from each of the agencies below on a regular basis. To save time, it is highly recommended that listings be requested or, if applicable, acquired online every 6 months for the entire jurisdiction. Information request letters to resource agencies need to contain a short description of the project(s), the location of the project(s) or jurisdictional limits (county, TRS), the specific request, and a map showing the project or jurisdiction location(s). Information should be requested for a minimum 1.0-mile radius around your project site.

18.1.1 Contacts

18.1.1.1 U.S. Fish and Wildlife Service (USFWS)

Provides legal listing for ESA species under USFWS jurisdiction, available at <http://www.fws.gov/wafwo/species.html>.

Western Washington:

Ken Berg
U.S. Fish and Wildlife Service
510 Desmond Drive SE, Suite 102
Lacey, WA 98503-1273
(360) 753-9440

Species listings for western Washington are available on a countywide basis online at <http://www.fws.gov/westwafwo/speciesmap.html>.

Eastern Washington:

Mark Miller
U.S. Fish and Wildlife Service
Spokane Field Office
11103 E. Montgomery Drive
Spokane Valley, WA 99206
(509) 891-6839

Currently, listings for eastern Washington are available on a countywide basis online at http://www.fws.gov/wafwo/species_EW.html.

18.1.1.2 National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries)

Provides legal listing for ESA species under their jurisdiction. (For local agencies, listings also available from WSDOT regional Highways and Local Programs offices.) Currently, salmon listings are available online at <http://www.nwr.noaa.gov/ESA-Salmon-Listings/Index.cfm>. All other listed species under NOAA's jurisdiction are available online at <http://www.nwr.noaa.gov/Species-Lists.cfm>.

Steve Landino
NOAA Fisheries Service
Habitat Program/Olympia Field Office
510 Desmond Drive SE, Suite 103
Lacey, WA 98503-1273
(360) 753-9440

18.1.1.3 Washington Department of Fish and Wildlife (WDFW)

Provides site-specific information on locations of species monitored by the state that are documented in the Priority Habitats and Species (PHS) database. This is sensitive, confidential information that will need to be requested through an information request form (preferred method) (<http://wdfw.wa.gov/conservation/phs/list/>) or by letter, and you will need to sign an agreement to obtain it. It cannot be published in any public document, except according to the size and scale specifications contained within the agreement. (This is the best information source on the presence of species near your project.) Within the range of the northern spotted owl and marbled murrelet, data for these species must be specifically requested. There is a fee associated with this information request. Also, a memorandum of understanding may be established between WDFW and the requesting organization in lieu of a signed agreement for each request. For WSDOT projects, this information can be requested through the project office and regional project biologist.

Lori Guggenmos
Priority Habitats and Species
Washington Department of Fish and Wildlife
600 Capitol Way North
Olympia, WA 98501-1091
(360) 902-2543

18.1.1.4 Washington Department of Natural Resources (WDNR)

Provides information on locations of sensitive plants and rare plant communities that are documented in the Natural Heritage Program (NHP) database. This information will need to be

requested by letter. For WSDOT projects, this information can be requested through the project office and regional project biologist.

John Gamon
 Washington Natural Heritage Program
 Department of Natural Resources
 P.O. Box 47014
 Olympia, WA 98504-7014
 (360) 902-1667

18.1.1.5 Washington Department of Fish and Wildlife Regional Habitat Program Managers

For assistance with priority habitats and species information, contact a regional habitat program manager, listed below, who will direct your questions to an area habitat biologist, also available at: <<http://wdfw.wa.gov/conservation/habitat/ahb/>>.

Region	Locations of Project (by county)	Contact Person/Email	Address/Phone
Eastern WA Region 1	Asotin, Columbia, Ferry, Garfield, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	Mark Wachtel Mark.Wachtel@dfw.wa.gov	WDFW, Region 1 2315 N Discovery Place Spokane, WA 99216-1566 (509) 892-7860 Ext. 320
North Central WA Region 2	Adams, Chelan, Douglas, Grant, Okanogan	Bob Steele Robert.Steele@dfw.wa.gov	WDFW, Region 2 1550 Alder Street NW Ephrata, WA 98823-9651 (509) 754-4624
South Central WA Region 3	Benton, Franklin, Kittitas, Yakima	Perry Harvester Perry.Harvester@dfw.wa.gov	WDFW, Region 3 1701 South 24th Avenue Yakima, WA 98902-5720 (509) 457-9314
North Puget Sound Region 4	King, Island, San Juan, Skagit, Snohomish, Whatcom	David Brock David.Brock@dfw.wa.gov	WDFW, Region 4 16018 Mill Creek Blvd. Mill Creek, WA 98012-1296 (425) 775-1311 Ext. 114
Southwest WA Region 5	Clark, Cowlitz, Klickitat, Lewis, Skamnia, Wahkiakum	Dave Howe David.Howe@dfw.wa.gov	WDFW, Region 5 2108 SE Grand Blvd. Vancouver, WA 98661 (360) 906-6729
Coastal Area Region 6	Clallam, Grays Harbor, Jefferson, Kitsap, Mason, Pacific, Pierce, Thurston	Steve Kalinowski Stevan.Kalinowski@dfw.wa.gov	WDFW, Region 6 48 Devonshire Road Montesano, WA 98563-9618 (360) 249-1227

Letter to the Department of Natural Resources Requesting Information on Sensitive and Rare Plants

September 23, 2009

Mr. John Gamon
Washington Natural Heritage Program
Division of Forest Resources
Department of Natural Resources
P.O. Box 47016
Olympia, WA 98504-7016

RE: Haystack Ridge Radio Site

Dear Mr. Gamon:

The Washington State Department of Transportation (WSDOT) is planning on building a new radio tower at Haystack Ridge, on a 50 by 400 foot site. The site, which is in Klickitat County, is located in the southwest quarter of the southeast quarter of Section 3, Township 2 North, Range 15 East of the Willamette Meridian.

We are requesting information on the presence of any sensitive plants or rare plant communities in the vicinity of our project. A map showing the approximate location of the project has been included for your use. If you have any questions, please either e-mail me at mcarey@wsdot.wa.gov or call me at 360-705-7404.

Sincerely,

Marion Carey
Wildlife Biologist

Letter to WDFW Requesting Priority Habitats and Species Information

(Response will contain federal listing information as well, but this letter cannot substitute a federal request for listing letter)

September 23, 2009

Lori Guggenmos
Priority Habitats and Species
WA Dept. Of Fish and Wildlife
P.O. Box 43135
Olympia, WA 98504-3135

RE: City of Jupiter Transportation Projects

Dear Ms. Guggenmos:

The Department of Public Works for the City of Jupiter is planning multiple transportation projects in Milky Way, Washington, over the next year. Our city is located near SR 770 near MP 36.08 to MP 45.30. The legal locations of our jurisdiction are as follows:

T15N, R18W, Sections 11, 10, 3, 4
T16N, R18W, Sections 33, 32, 29, 28, 21, 16, 17, 18, 7, 6
T16N, R17W, Sections 1, 12
T17N, R17W, Sections 36, 25
T17N, R18W, Sections 31, 30

We are requesting updated information on the species that are documented in the PHS database, including spotted owls and marbled murrelets that may be present within the area of the City of Jupiter. We have enclosed an information request form further detailing our project and information needs. A map showing the approximate location has been included. If you have any questions, please feel free to call me at (360) 705-7405 or email me at jorgenk@jupiter.wa.gov.

Sincerely,

Marion Carey
Wildlife Biologist

18.2 Local Agency Environmental Classification Summary Form

The local agency environmental classification summary (ECS) form is now available online (in PDF or FileMaker Pro format) from the WSDOT Highways and Local Programs website: <http://www.wsdot.wa.gov/localprograms/environment/>.

18.3 Endangered Species Act Stormwater Design Checklist Overview

The Stormwater Design Checklist assists project designers in providing pertinent information about a project's stormwater treatment facilities to biologists responsible for preparing biological assessments required for consultation under Section 7 of the Endangered Species Act. The use of this checklist is necessary to aid in developing biological assessments and to promote consistency in the content provided in the agency's biological assessments.

It is possible that the specific conditions of some projects may warrant modifying or adding certain checklist items. However, to maintain consistency in the type and amount of information collected and submitted for the environmental permitting process, the checklist should be modified only if necessary.

There are two checklists available; one for western Washington and one for eastern Washington. Both checklists and the specific protocols for analyzing stormwater in these respective areas of the state are available on the following WSDOT website: <http://www.wsdot.wa.gov/Environment/Biology/BA/BAGuidance.htm#Stormwater>.

18.3.1 Runoff Treatment

In another noteworthy revision, these checklists no longer refer to treating 140 percent of new impervious surface area for basic water quality treatment. The 140 percent approach was associated with conventional runoff treatment BMPs employing filtration or settlement of pollutants as the removal mechanism (e.g., biofiltration swales, filter strips, and basic wet ponds). Since the development of the 140 percent threshold in 1999, stormwater management in Washington State has changed considerably. The Ecology stormwater management manuals for western and eastern Washington now require that arterial and highway runoff be given "enhanced" treatment. *Enhanced treatment*, as defined in the Ecology manuals, is a treatment system optimized to improve the capture of dissolved metals through processes involving sorption, ion exchange, biofiltration, or precipitation.

The 2008 WSDOT *Highway Runoff Manual* contains several designs that achieve both basic and enhanced treatment within a single stormwater facility. Examples include designs for the ecology

embankment, dispersion, compost-amended filter strip, and enhanced biofiltration swale, among others.

The former 140 percent threshold was developed as the level of runoff treatment necessary to result in a biological assessment determination of *no effect* on protected species, given basic treatment's pollutant-removal effectiveness of less than 100 percent. With the availability of enhanced treatment and more specific guidance in the *Highway Runoff Manual* for retrofitting existing impervious surfaces, treating 140 percent of the new impervious surface is no longer necessary to achieve a determination of *no effect*.

18.3.2 Flow Control

For flow control, the method used in Instructional Letter 4020.02 required the use of a volume correction factor to increase the volume of detention ponds designed using an event-based model, the Santa Barbara Urban Hydrograph (SBUH) method. For stormwater detention designs in western Washington, the SBUH method has since been replaced with U.S. Environmental Protection Agency's Hydrologic Simulation Program – Fortran-based (HSPF-based) continuous runoff models, such as MGSFlood, the King County Runoff Time Series, or the Western Washington Hydrologic Model. These continuous runoff models enable detention ponds and discharge orifices to be sized with post-project flow/duration curves matching some desired predevelopment condition. The result is significantly larger detention ponds than those previously constructed under Instructional Letter 4020.02.

In eastern Washington, the rational method or single event hydrograph methods (Soil Conservation Service [SCS] or Santa Barbara Unit Hydrograph [SBUH]) can be used. To provide a detailed quantitative analysis of potential project effects on flow durations, a continuous hydrologic simulation model would be needed but no such model is available for use in eastern Washington and therefore a surrogate analysis method using a single event hydrograph method should be employed. The *Highway Runoff Manual* provides flow control design guidance for eastern Washington for use with a unit hydrograph model that approximates the peak flow reduction needed to prevent an increase in the durations of channel-forming peak flows.

19.0 Submitting a No-Effect Letter or Biological Assessment

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19.0 Submitting a No-Effect Letter or Biological Assessment

Section 7 consultation is initiated with the Services (NOAA Fisheries or USFWS) by submittal of a biological assessment with a cover letter requesting consultation. Consultation is initiated by the appropriate WSDOT Regional Biologist not the project biologist. Project biologists are responsible for completing the biological assessment analysis and providing this documentation along with required effect determinations to the project manager or regional biologist, depending on which individual has served as the primary point of contact throughout the development of the biological assessment. The project manager will coordinate with the regional biologist to ensure the documents are submitted, along with a formal cover letter, to the Services for consultation.

A *no-effect* letter or *no effect* assessment, indicating that a project will not result in an adverse effect on listed species or designated critical habitat, documents the *no-effect* determination for the federal action agency and does not require concurrence by the Services, but it must be documented with the appropriate agency.

Determining which agencies require the particular forms of documentation can be confusing and depends on the current policies of the USFWS, NOAA Fisheries, and the federal action agencies involved. This chapter provides guidance to WSDOT Regional Biologists for identifying the agencies that require documentation regarding *no-effect* determinations or initiating Section 7 consultation with the Services.

This chapter, in particular the templates and checklists for no effect letters and biological assessments, has been included in this manual as a reference for project biologists to aid in the preparation of biological assessments.

19.1 Submitting a No-Effect Letter or No Effect Assessment

No-effect letter or no effect assessments recipients, copy recipients, required attachments, and contacts for coordinating consultation for WSDOT projects are listed in Tables 19-1 and 19-2.

All no-effect letters or no effect assessments are sent to the federal action agency (FHWA or the Corps of Engineers) for its files. Because no effect documents are sent to the action agency only, biologists may choose to address species under the jurisdictions of USFWS and NOAA Fisheries in a single letter rather than in two separate letters.

Copies of the no-effect document and enclosures should be sent to the WSDOT regional biologist or biology program manager and the regional environmental manager. USFWS and NOAA have requested that they not be sent copies of no-effect letters or assessments.

Table 19-1. Document routing for no-effect letters/assessments and biological assessments.

Document Type	Effect Determination	Sender	Recipient	Copy Recipients:
For species under the jurisdiction of NOAA Fisheries				
No-effect letter or assessment	NE	Nonfederal designee ^a	FHWA or Corps of Engineers	WSDOT region ^b FHWA or Corps of Engineers Corps of Engineers (for FHWA projects requiring a Corps permit)
Informal initiation package	NLTAA	Nonfederal designee ^a	NOAA Fisheries	WSDOT region ^b FHWA or Corps of Engineers Corps of Engineers (for FHWA projects requiring a Corps permit)
Formal initiation package	LTAA	Federal action agency (FHWA or Corps of Engineers) ^b	NOAA Fisheries	WSDOT region ^b Corps of Engineers (for FHWA projects requiring a Corps permit)
For species under the jurisdiction of USFWS				
No-effect letter or assessment	NE	Nonfederal designee ^a	FHWA or Corps of Engineers	WSDOT region ^b FHWA or Corps of Engineers Corps of Engineers (for FHWA projects requiring a Corps permit)
Informal initiation package	NLTAA	Nonfederal designee ^a	USFWS	WSDOT region ^b FHWA or Corps of Engineers Corps of Engineers (for FHWA projects requiring a Corps permit)
Formal initiation package	LTAA	Federal action agency (FHWA or Corps of Engineers) ^c	USFWS	WSDOT region ^b Corps of Engineers (for FHWA projects requiring a Corps permit)

^a The nonfederal designee status is issued to a state or local agency in a letter by a federal action agency. FHWA has designated WSDOT as its nonfederal designee. The Corps of Engineers has several nonfederal designees, including WSDOT. Other agencies such as USFS, USNP, FTA and FRA have not made this designation.

^b WSDOT region: Include the regional biologist or biology program manager and the regional environmental manager.

^c WSDOT sends the project information and effect determinations in the form of a draft cover letter by electronic mail to the federal action agency. The BA is sent only in hard copy form to the federal action agency.

Table 19-2. WSDOT contact list for no-effect letters/assessments and biological assessments.

Agency	Address
USFWS Eastern Washington	Current manager Eastern Washington field office U.S. Fish and Wildlife Service 11103 E. Montgomery Drive Spokane, WA 99206
USFWS Western Washington	Current manager Western Washington Fish and Wildlife Office U.S. Fish and Wildlife Service 510 Desmond Drive SE, Suite 102 Lacey, WA 98503-1273
NOAA Fisheries	Current director NOAA Fisheries Habitat Program/Olympia field office 510 Desmond Drive SE, Suite 103 Lacey, WA 98503-1273
FHWA	Area engineer FHWA < http://www.fhwa.dot.gov/wadiv/progdel.htm >
Corps of Engineers	Corps liaison- see Liason Branch section of < http://www.wsdot.wa.gov/Environment/resource_liaisons.htm >
WSDOT	Regional biologist or biology program manager or Environmental manager < http://www.wsdot.wa.gov/Environment/Contacts.htm >

If a project is conducted by FHWA and requires a permit from the U.S. Army Corps of Engineers, the Corps also receives a copy of the no-effect letter and enclosures.

No-effect letters should be submitted with vicinity and site maps, site photographs, and a species list. Examples of no-effect letters are provided in Section 19.1.1.

19.1.1 No-Effect Letter Template

The no effect (NE) letter template should be used for projects that result in a no effect determination on listed species or designated critical habitat, such as projects with no new impervious surface, no species use of the action area, or no potential indirect effects. The NE letter should be only 2 to 4 pages in length. The most current no effect letter template is available on WSDOT's website at: <http://www.wsdot.wa.gov/NR/rdonlyres/703D4347-8F0B-4E2F-82A1-C8B70DBB0275/0/BA_NoEffectLtrTemplate.pdf>.

The NE letter should be addressed to the FHWA Area Engineer or the Corps of Engineers Liaison; however, the NE letter should only be sent by WSDOT, and should be provided to WSDOT in an electronic form for final formatting and signature. Include the project name, WSDOT project number and, if applicable the FHWA project number in the subject line. The NEL should end with this language: *“It is our understanding that this satisfies our responsibilities under Section 7(c) of the Endangered Species Act at this time, and we are sending you this copy of our assessment for your files. We will continue to remain aware of any change in status of these species and will be prepared to re-evaluate potential project impacts if necessary.”* If FHWA is the lead and the project requires a Corps permit, then the Corps of Engineers should also be cc'd. If the Corps of Engineers is the lead, there is no federal funding so FHWA is not cc'd.

Examples of No-Effect Letters

19.1.1.1 No-Effect Letter Submitted to the Federal Highway Administration for Species Under the Jurisdiction of the U.S. Fish and Wildlife Service

Date

Name of area engineer

Federal Highway Administration

Region

Address

Subject: No-effect Letter; SR 302, Elgin – Clifton Road Intersection, MP 10.51 to 10.63
WSDOT Project No. _____
Federal Aid No. _____

Dear *name of area engineer*:

Describe project: The Washington State Department of Transportation (WSDOT) is proposing to improve safety at a high accident location by installing a traffic signal with possible illumination, repairing a failing shoulder, upgrading associated signs, repaving, and restriping the intersection of State Route (SR) 302 at the Elgin–Clifton road intersection. The intersection is a high traffic area where existing stop signs are not adequate for the present level of traffic volume.

We have prepared this assessment on behalf of the Federal Highway Administration (FHWA) to address federally listed threatened or endangered species under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS).

Give names of listed species present: The current USFWS listing of species under its jurisdiction indicates the potential presence in the project area of threatened bull trout, marbled murrelet, northern spotted owl, gray wolf, grizzly bear, marsh sandwort, golden paintbrush and water howellia. Critical habitat for northern spotted owl and marbled murrelet has been designated in the county, and critical habitat has been proposed for bull trout.

The possible presence of listed species in the project area was further evaluated by reviewing Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) data, WDFW Wildlife Heritage data set, WDFW Stock Inventory data, and the Washington Department of Natural Resources (WDNR) Natural Heritage Program rare plant data.

Describe project location: The proposed project is located on the Kitsap Peninsula, in Pierce County, Washington on SR 302 from milepost (MP) 10.51 to MP 10.63 (Township 22 North, Range 1 East, Sections 20 and 29). The project area will be within the developed road prism of SR 302 at the Elgin–Clifton intersection with the Gig Harbor-Longbranch Highway. The action

area for the project will be 0.25 miles around the project due to the increased noise and visual disturbance during construction.

Describe project activities: Proposed work includes installation of a traffic light and signal box, and trenching of conduit. All work will occur in the existing road right of way. The signal box will most likely be located in the traffic island due to ease of access for future maintenance. Any vegetation to be removed for signal box installation, signal placement, and conduit trenching will consist of nonnative blackberries, Scot's broom, and roadside grasses. The concrete for the new signal will cure for approximately 30 days. New impervious surface will be minimal (approximately 32 square feet) for the signal box. Pavement will then be overlaid, restriped, and signage upgraded. The pavement overlay will include grinding at the abutment to existing pavement before the pavement overlay.

To repair a failing shoulder, an existing cross-culvert will be cut and extended approximately 10 feet. This will involve removal of minor amounts of salal and roadside grasses. Approximately 10 cubic yards of fill will be added to the shoulder to repair the roadbed, and bring the shoulder to standard, before the pavement overlay. All work will take place from the existing roadway, and the final shoulder will match the original road prism. Traffic may be detoured approximately 0.5 miles around the intersection from SR 302 to 134th Road (a road that receives heavy traffic under normal conditions) during the second phase for up to 2 nights.

Describe construction schedule: Construction is scheduled to begin in June 2005 and will be completed by September 2005. Actual workdays for the project will be approximately 2 days for the first phase of the project, and approximately 2 days for second phase of the project.

Describe land use in the vicinity: Land use in the vicinity of the project area is low-density rural residential, managed timberland, and some commercial buildings along the detour route. Noise levels are relatively high due to the high traffic volumes associated with the intersection.

Describe habitat present as it relates to threatened and endangered species: Overstory vegetation near the roadway is comprised primarily of second growth Douglas fir with some red and madrone. Understory vegetation near the roadway consists of nonnative Scot's broom, Himalayan blackberry, and roadside grasses. Swordfern, evergreen huckleberry, and salal also occur in the project area. A traffic island, located at the intersection of the project, contains roadside grasses and Scot's broom. Residential ornamental vegetation and lawns are located off the roadway corridor in the action area.

Describe availability of suitable habitat: WSDOT biologists visited the project area on date to determine the status and availability of suitable habitat for listed species in the project area and to evaluate any potential impacts of the proposed project. Water howellia and marsh sandwort occur in wetland habitats. Potential suitable habitat may exist for water howellia and marsh sandwort in wetland areas present outside the project work area in the action area. The project will not disturb or alter wetland areas, hydrology will not be altered, and only minimal new impervious surface will be created. Therefore, the project will have no effect on water howellia or marsh sandwort.

There are no streams within 0.25 miles of the project. Therefore, no suitable habitat exists for bull trout in the action area. There are no mature forests within 0.25 miles of the project that contain habitat elements suitable for either northern spotted owl or marbled murrelet. The action area does not contain any prairie habitat that would be suitable for golden paintbrush. Gray wolf and grizzly bear suitable habitat may occur in the eastern Pierce County, but not on the Kitsap Peninsula in western Pierce County. Therefore, the project will have *no effect* on bull trout, northern spotted owl, marbled murrelet, golden paintbrush, gray wolf, or grizzly bear.

The project action area does not contain designated critical habitat for northern spotted owl and marbled murrelet or proposed critical habitat for bull trout. Therefore, the project will have *no effect* on critical habitat for northern spotted owl, marbled murrelet, or proposed critical habitat for bull trout.

This assessment satisfies the *title of action agency's* responsibilities under Section 7(c) of the Endangered Species Act at this time. We are sending you this copy of our assessment for your files. We will continue to remain aware of any change in status of these species and will be prepared to reevaluate potential project impacts if necessary.

Please call *name of project biologist* (WSDOT, *telephone number*) if you require additional information or if you have any questions about this project.

Sincerely,

Name of biology program manager

Title of biology program manager

Enclosures: *Vicinity and site maps, photos, and USFWS species listing*

cc w/enclosures: *Name of regional environmental manager, WSDOT region*
 Name of regional biology branch manager, WSDOT region
 Corps liaison (if this is a FHWA project requiring a Corps permit)

19.1.1.2 Example 2: No-Effect Letter Submitted to the Federal Highway Administration for Species Under the Jurisdiction of NOAA Fisheries

Date

Name of area engineer

Federal Highway Administration

Region

Address

Subject: No-effect Letter; SR 302, Elgin – Clifton Road Intersection, MP 10.51 to 10.63
WSDOT Project No. _____
Federal Aid No. _____

Dear *name of area engineer*:

Describe project: The Washington State Department of Transportation (WSDOT) is proposing to improve safety at a high accident location by installing a traffic signal with possible illumination, repairing a failing shoulder, upgrading associated signs, repaving, and restriping the intersection of State Route (SR) 302 at the Elgin–Clifton road intersection. The intersection is a high traffic area where existing stop signs are not adequate for present traffic volumes. We have prepared this assessment on behalf of the Federal Highway Administration (FHWA) to address federally listed species under the jurisdiction of the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries).

Describe listed species present: NOAA Fisheries provides listings of threatened and endangered species under its jurisdiction. The current listing indicates the potential presence of the Puget Sound evolutionarily significant unit (ESU) of Chinook salmon in the project area. In addition, designation of critical habitat for Puget Sound ESU Chinook salmon has been proposed in the project action area.

Describe project location: The proposed project is located on the Kitsap Peninsula in Pierce County, Washington, on SR 302 from milepost (MP) 10.51 to MP 10.63 (Township 22 North, Range 1 East, Sections 20 and 29). The project area will be within the developed road prism of SR 302 at the Elgin–Clifton intersection with the Gig Harbor-Longbranch Highway. The action area for the project will be 0.25 miles around the project footprint due to the potential for increased noise and visual disturbance during construction.

Describe project activities: Proposed work includes installation of a traffic light and signal box, and trenching of conduit. All work will occur within the existing road right-of-way. The signal box will most likely be located in the traffic island due to ease of access for future maintenance.

Any vegetation to be removed for signal box installation, signal placement, and conduit trenching will consist of nonnative blackberries, Scot's broom, and roadside grasses. The concrete for the new signal will cure for approximately 30 days. New impervious surface will be minimal (approximately 32 square feet) for the signal box. Pavement will then be overlaid and restriped, and signage will be upgraded. The pavement overlay will include grinding at the abutment to existing pavement before the pavement overlay.

To repair a failing road shoulder, an existing cross-culvert will be cut and extended approximately 10 feet. This will involve removal of minor amounts of salal and roadside grasses. Approximately 10 cubic yards of fill will be added to the shoulder to repair the roadbed, and bring the shoulder to standard, before the pavement overlay. All work will take place from the existing roadway, and the final shoulder will match the original road prism. Traffic may be detoured approximately 0.5 miles around the intersection from SR 302 to 134th Road during the second phase for up to 2 nights.

Describe construction schedule: Construction is scheduled to begin in June 2005 and will be completed by September 2005. Actual workdays for the project will be approximately 2 days for the first phase of the project, and approximately 2 days for second phase of the project.

Describe land use in the vicinity: Land use in the vicinity of the project area is low-density rural residential, managed timberland, and some commercial buildings along the detour route. Noise levels are relatively high due to the high traffic volumes associated with the intersection.

Describe habitat present as it relates to threatened and endangered species: WSDOT biologists visited the project area on *date* to determine the status and availability of suitable habitat for listed species in the project area and to evaluate any potential impacts of the proposed project. The project does not involve any work in or near aquatic habitats and creates minimal new nonpolluting impervious surface.

Therefore, the project will have *no effect* on Puget Sound ESU Chinook salmon. The project *will not destroy or adversely modify* proposed critical habitat for Puget Sound ESU Chinook salmon. If proposed critical habitat is designated for Puget Sound ESU Chinook salmon prior to completion of the project, the project will have *no effect* on Puget Sound ESU Chinook critical habitat.

This assessment satisfies the *title of action agency's* responsibilities under Section 7(c) of the Endangered Species Act at this time. We are sending you this copy of our assessment for your files. We will continue to remain aware of any change in status of these species and will be prepared to reevaluate potential project impacts if necessary.

In compliance with the Magnuson-Stevens Fishery Conservation and Management Act, essential fish habitat (EFH) was assessed for the project. It was determined that the project will not have an adverse effect on EFH.

Please call *name of project biologist* (WSDOT, *telephone number*) if you require additional information or if you have any questions about this project.

Sincerely,

Name of biology program manager

Title of biology program manager

Enclosures: *Vicinity and site maps, photos, and NOAA species listing*

cc w/enclosures: *Name of regional environmental manager, WSDOT region*
Name of regional biology branch manager, WSDOT region
Corps liaison (if this is a FHWA project requiring a Corps permit)

19.1.2 No-Effect Letter Review Checklist

Typically, the no-effect letter (NEL) should be two to three pages in length, depending on the complexity of the proposed action. The purpose of the NEL is to document and support the no-effect determination(s). The focus of a NEL should be a brief but complete project description, species habitat and occurrence information, analysis of project impacts, and justification for the no-effect determination. To ensure that no effect letters contain the required information and the appropriate level of detail, WSDOT has developed a no-effect letter checklist for its reviewers that can also be used proactively by authors to develop no effect letters that meet WSDOT expectations. The checklist is available on WSDOT's website at: <<http://www.wsdot.wa.gov/Environment/Biology/BA/BAtemplates.htm>>.

19.1.3 No-Effect Assessment Template

The NE assessment template should be used for projects that result in a no effect determination but require additional documentation and analysis to support the NE determination, such as projects with new impervious surface (i.e., document lack of stormwater impacts), projects with complicated action areas, or projects that require completion of a detailed indirect effects analysis. The NE assessment is a 5 to 10 page report and includes appendices. The no-effect assessment template is available on the WSDOT Biology website at: <<http://www.wsdot.wa.gov/Environment/Biology/BA/BAtemplates.htm>>.

When developing the content for a no-effect assessment, refer to both the No-Effect Letter Checklist (provided above) and also to the WSDOT Biological Assessment Review Checklist (provided in Section 19.2.1 below) for guidance. The latest versions of all templates and review checklists are available on the WSDOT website referenced above.

19.2 Submitting a Biological Assessment

BA recipients, copy recipients, required attachments, and contacts for coordinating consultation for WSDOT projects are listed in Tables 19-1 and 19-2. A finished BA includes vicinity and site maps, and site photographs. Project diagrams are included when appropriate. A BA submitted to the USFWS must include a copy of the species list obtained from the USFWS (except programmatic BAs submitted by WSDOT biologists).

NMFS is now requesting that WSDOT projects potentially affecting **both** listed salmonids and marine mammals (i.e., southern resident killer whale and steller sea lion) submit two copies of the biological assessment for review. This policy stems from review procedures that have been initiated in the agency to address listed killer whales. One copy of the document will be reviewed by NMFS staff specializing in listed salmonids, and the second copy of the document will be reviewed by staff specializing in marine mammals.

A nonfederal agency (such as WSDOT) that is named by a federal action agency as its nonfederal designee may submit a BA for informal consultation. Section 19.2.2 provides example cover letters for initiating informal consultation with the Services. For WSDOT, only the Army Corps of Engineers and Federal Highway Administration have named WSDOT as a federal designee. Therefore, when other federal agencies are the lead action agencies (such as the Forest Service, Federal Transit Authority, Federal Railway Administration or National Parks), the following transmittal procedures may not apply. Contact the agency directly on their procedures.

Formal consultation packages are submitted to the Service(s) by the federal action agency. For a formal consultation where FHWA is the lead action agency, WSDOT mails a hard copy of the BA along with a cover letter (19.2.3.1) providing the project number, project description, and effect determinations to the Area Engineer. In addition, send an electronic message requesting BA transmittal to the Area Engineer, Environmental Program Manager and Field Operations Team Leader. The email should contain the BA and a draft letter to the applicable Service(s). Examples of the FHWA draft transmittal letters are provided in Sections 19.2.3.2 – 19.2.3.4.

If a project is conducted by FHWA and requires a permit from the Corps of Engineers, the Corps receives a copy of the BA.

19.2.1 Biological Assessment Template and Review Checklist

A biological assessment should be prepared for projects that result in a not likely to adversely affect (NLTA) and/or adversely affect (AA) determination. A biological assessment template is available on the WSDOT Biology website. The WSDOT Biological Assessment Review Checklist is available on-line at:

<http://www.wsdot.wa.gov/Environment/Biology/BA/BAtemplates.htm#BA>.

19.2.2 Informal Consultation

19.2.2.1 Example of Cover Letter for Initiating Informal Consultation with the U.S. Fish and Wildlife Service

Date

Name of current manager

U.S. Fish and Wildlife Service

Address for western Washington USFWS office or Spokane field office

Subject: Biological Assessment for SR 105 North Cove Erosion Protection, MP 20.15 to 20.49

WSDOT Project No. _____

Federal Aid No. _____

Dear *name of current manager*:

The Washington State Department of Transportation (WSDOT), on behalf of the Federal Highway Administration (FHWA) is planning to complete an erosion protection project on SR 105 this winter. The project is located on SR 105 from milepost (MP) 20.15 to MP 20.49, along the edge of Willapa Bay in Pacific County (T14N R14W S04). The project includes funding from the FHWA. Therefore, it is subject to requirements under Section 7(c) of the Endangered Species Act.

If the project has been presented at a pre-BA meeting with the Services, include this following paragraph: This project was presented at a pre-biological assessment meeting with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) on *date*. In attendance were *names of attendees* from the USFWS and *names of attendees* from NOAA Fisheries.

Give names of species assessed: The enclosed biological assessment analyzes potential impacts of the proposed project on brown pelican, bull trout, marbled murrelet, northern spotted owl, Oregon silverspot butterfly, short-tailed albatross, western snowy plover, and green, leatherback, loggerhead and olive ridley sea turtles, as well as western snowy plover critical habitat, marbled murrelet critical habitat, and proposed critical habitat for bull trout.

State BA conclusions: The biological assessment concludes that the project *may affect is not likely to adversely affect* marbled murrelet, and will have *no effect* on brown pelican; northern spotted owl; Oregon silverspot butterfly; short-tailed albatross; western snowy plover; green, leatherback, loggerhead, and olive ridley sea turtles; critical habitat for western snowy plover and marbled murrelet; and proposed critical habitat for bull trout. We have determined that this project *will not destroy or adversely modify* bull trout critical habitat. However, if bull trout critical habitat becomes designated prior to completion of the project, the project will have *no effect* on bull trout critical habitat.

It is our understanding that with federal concurrence this satisfies our responsibilities under Section 7(c) of the Endangered Species Act at this time. We will continue to remain aware of any change in status of these species and will be prepared to reevaluate potential project impacts if necessary.

Please contact *project biologist name* at *telephone number* if you require additional information or if you have any questions about this project.

Sincerely,

Name of biology program manager

Title of biology program manager

Enclosure: Biological assessment

cc: w/ enclosure: *Name of regional environmental manager, WSDOT region*
 Name of regional biology branch manager, WSDOT region
 Area engineer, FHWA
 Corps liaison (if this is an FHWA project requiring a Corps permit)

19.2.2.2 Example of Cover Letter for Initiating Informal Consultation with NOAA Fisheries

Date

Washington State Director for Habitat Conservation
NOAA Fisheries
Habitat Program/Olympia Field Office
510 Desmond Drive SE, Suite 103
Lacey, Washington 98503-1273

Subject: Biological Assessment for SR 105 North Cove Erosion Protection, MP 20.15 to 20.49
WSDOT Project No. _____
Federal Aid No. _____

Dear *name of current director*:

The Washington State Department of Transportation (WSDOT), on behalf of the Federal Highway Administration (FHWA), is planning to complete an erosion protection project on SR 105 this winter. The project is located on SR 105 from milepost (MP) 20.15 to MP 20.49, along the edge of Willapa Bay in Pacific County (T14N R14W S04). The project includes funding from the FHWA. Therefore, it is subject to requirements under Section 7(c) of the Endangered Species Act.

If the project has been presented at a pre-BA meeting with the Services, include this paragraph: This project was presented at a pre-biological assessment meeting with the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) on *date*. In attendance were *names of attendees* from NOAA Fisheries and *names of attendees* from USFWS.

The enclosed biological assessment analyzes potential impacts of the proposed project on Steller sea lion and green, leatherback, loggerhead, and olive ridley sea turtles, as required under Section 7(c) of the Endangered Species Act.

The biological assessment concludes that the project *may affect but is not likely to adversely affect* Steller sea lions, and will have *no effect* on sea turtles. Southern resident killer whales are proposed for listing as threatened under the Endangered Species Act.

We have determined that this project *will not jeopardize the continued existence of* southern resident killer whales. However, if southern resident killer whales become listed prior to completion of the project, the project *may affect but is not likely to adversely affect* southern resident killer whales.

Therefore, WSDOT is requesting informal consultation on Steller sea lions and informal conference on southern resident killer whales.

It is our understanding that with federal concurrence this satisfies our responsibilities under Section 7(c) of the Endangered Species Act at this time. We will continue to remain aware of any change in status of these species and will be prepared to reevaluate potential project impacts if necessary.

In compliance with the Magnuson-Stevens Fishery Conservation and Management Act, essential fish habitat (EFH) was assessed for the project. It was determined; the project *will not have an adverse effect on EFH*.

Please contact *name of project biologist* at *telephone number* if you require additional information or have any questions about this project.

Sincerely,

Name of biology program manager
Title of biology program manager

Enclosure: Biological assessment

cc: w/ enclosure: *Name of environmental manager, WSDOT region*
 Name of regional biology branch manager, WSDOT region
 Name of area engineer, FHWA
 Corps liaison (if this is an FHWA project requiring a Corps permit)

19.2.3 Formal Consultation

19.2.3.1 Example of Cover Letter provided by WSDOT to a Federal Action Agency for Its Initiation of Formal Consultation with the U.S. Fish and Wildlife Service or NOAA Fisheries

The federal action agency (FHWA or Corps of Engineers) initiates formal consultation with the Services. WSDOT provides the federal action agency with a formal draft cover letter (below) containing a project description and the effect determinations for transmittal to the Services:

Date _____

Subject: Biological assessment for SR 105 to Grays Harbor County Line bridge replacement,
Milepost _____
Federal Aid No. _____
WSDOT Project No. _____

The Federal Highway Administration (FHWA) is providing funds to the Washington State Department of Transportation (WSDOT) to ... *or*

The U.S. Army Corps of Engineers is issuing a permit to the Washington State Department of Transportation (WSDOT) to ...

conduct a bridge replacement project on State Route 105 in Pacific County, Washington. The project is located on SR 105 from MP 20.15 to MP 26.49, in Pacific County (T14N R14W).

The project will replace the super structure of an existing bridge (bridge platform, supports, rails, roadway and striping) but will make use of existing piles and bridge foundations and requires no in-water work. The project is scheduled between June 15, 2005 and July 15, 2005. A total of 1 month will be required to complete work.

The enclosed biological assessment was prepared on our behalf by WSDOT for listed species as required under Section 7(c) of the Endangered Species Act. The biological assessment concludes that the project *may affect and is likely to adversely affect* marbled murrelet as a result of the proposed construction activities in close proximity to unsurveyed suitable marbled murrelet nesting habitat. Additionally, the biological assessment concludes that the proposed project will have *no effect* on marbled murrelet critical habitat, western snowy plover critical habitat, and Oregon silverspot butterfly; and *may affect but is not likely to adversely affect* bull trout, brown pelican, northern spotted owl, and western snowy plover.

Therefore, we are requesting formal consultation on the marbled murrelet, and informal consultation on bull trout, brown pelican, northern spotted owl, and western snowy plover.

It is our understanding that following the completion of formal consultation on marbled murrelet, and receiving concurrence on bull trout, brown pelican, northern spotted owl, and western snowy plover, our responsibilities under Section 7(c) of the Endangered Species Act will be satisfied.

Please contact *name of project biologist* (WSDOT telephone number) if you require additional information or have any questions about this project.

cc: *Name of environmental manager, WSDOT region*
 Name of area engineer, WSDOT region, title of area engineer
 Name of regional biology branch manager, WSDOT
 Corps liaison (if this is an FHWA project requiring a Corps permit)

19.2.3.2 Draft Letter for FHWA to Initiate Formal Consultation with the Eastern Washington U.S. Fish and Wildlife Service Field Office

Date

Mark Miller
United States Fish and Wildlife Service
11103 E. Montgomery Drive, Suite 2
Spokane, WA 99206

[*Project Name*] Request for Formal
Consultation with USFWS

Dear Mr. Miller:

The Federal Highway Administration (FHWA), as the lead Federal agency, is submitting this request for formal consultation with US Fish and Wildlife Service (USFWS), as required under Section 7(a)(2) of the Endangered Species Act (as amended). FHWA is providing the enclosed Biological Assessment.

Project activities [*insert description of project activities*].

Construction is tentatively scheduled to begin in [*insert month and year*] and be completed in [*insert month and year*], at total of approximately [*insert number*] months or approximately [*insert number*] working days.

In regards to species under the jurisdiction of USFWS, FHWA has concluded that the proposed project **May Affect, and is Likely to Adversely Affect** [*insert species*], [*include all other species and affect calls for the project*]

FHWA is requesting formal consultation as allowed by 51 CFR 402.12(j). With submittal of this BA, FHWA has provided USFWS with all the best scientific and commercial data available concerning the impact of the proposed project on listed species.

FHWA understands that, as stipulated in ESA Section 7(b)(1)(A) and 50 CFR 402.14(e), formal consultation will be initiated by your receipt of this formal consultation request, and will conclude within 90 days from that date. We look forward to receiving a letter from you in 30 days concurring with our effect determinations. If no letter is received we will assume that you are in concurrence with the effect determinations. Additionally, we understand that a Biological Opinion will be prepared by USFWS within 45 days of completing the consultation period. FHWA request copies of the draft Biological Opinion, incidental take statement, terms and conditions, and reasonable and prudent measures for review prior to USFWS finalizing the Biological Opinion.

Enclosed are both a hard copy and an electronic version of the biological assessment. [*edit as necessary*]

If you have any questions about this project, or need additional clarification, please contact [*insert your name*], FHWA Area Engineer, at [*insert your phone number*].

[*Signed by Area Engineer*]

cc: *Name of environmental manager, WSDOT region*
 Name of area engineer, WSDOT region, title of area engineer
 Name of regional biology branch manager, WSDOT
 Corps liaison (if this is an FHWA project requiring a Corps permit)

19.2.3.3 Draft Letter for FHWA to Initiate Formal Consultation with the Western Washington U.S. Fish and Wildlife Service Office

Date

Ken Berg
United States Fish and Wildlife Service
510 Desmond Drive SE, Suite 102
Lacey, Washington 98503

[*Project Name*] Request for Formal
Consultation with USFWS

Dear Mr. Berg:

The Federal Highway Administration (FHWA), as the lead Federal agency, is submitting this request for formal consultation with US Fish and Wildlife Service (USFWS), as required under Section 7(a)(2) of the Endangered Species Act (as amended). FHWA is providing the enclosed Biological Assessment.

Project activities [*insert description of project activities*].

Construction is tentatively scheduled to begin in [*insert month and year*] and be completed in [*insert month and year*], at total of approximately [*insert number*] months or approximately [*insert number*] working days.

In regards to species under the jurisdiction of USFWS, FHWA has concluded that the proposed project **May Affect, and is Likely to Adversely Affect** [*insert species*], [*include all other species and affect calls for the project*]

FHWA is requesting formal consultation as allowed by 51 CFR 402.12(j). With submittal of this BA, FHWA has provided USFWS with all the best scientific and commercial data available concerning the impact of the proposed project on listed species.

FHWA understands that, as stipulated in ESA Section 7(b)(1)(A) and 50 CFR 402.14(e), formal consultation will be initiated by your receipt of this formal consultation request, and will conclude within 90 days from that date. We look forward to receiving a letter from you in 30 days concurring with our effect determinations. If no letter is received we will assume that you are in concurrence with the effect determinations. Additionally, we understand that a Biological Opinion will be prepared by USFWS within 45 days of completing the consultation period. FHWA request copies of the draft Biological Opinion, incidental take statement, terms and conditions, and reasonable and prudent measures for review prior to USFWS finalizing the Biological Opinion.

Enclosed are both a hard copy and an electronic version of the biological assessment. [*edit as necessary*]

If you have any questions about this project, or need additional clarification, please contact [*insert your name*], FHWA Area Engineer, at [*insert your phone number*].

[*Signed by Area Engineer*]

cc: *Name of environmental manager, WSDOT region*
 Name of area engineer, WSDOT region, title of area engineer
 Name of regional biology branch manager, WSDOT
 Corps liaison (if this is an FHWA project requiring a Corps permit)

19.2.3.4 Draft Letter for FHWA to Initiate Formal Consultation with the National Marine Fisheries Service

Date

Steve Landino
National Marine Fisheries Service
510 Desmond Drive SE, Suite 103
Lacey, Washington 98503

[*Project Name*] Request for Formal
Consultation with USFWS

Dear Mr. Landino:

The Federal Highway Administration (FHWA), as the lead Federal agency, is submitting this request for formal consultation with the National Marine Fisheries Service (NMFS), as required under Section 7(a)(2) of the Endangered Species Act (as amended). FHWA is providing the enclosed Biological Assessment.

Project activities [*insert description of project activities*].

Construction is tentatively scheduled to begin in [*insert month and year*] and be completed in [*insert month and year*], at total of approximately [*insert number*] months or approximately [*insert number*] working days.

In regards to species under the jurisdiction of USFWS, FHWA has concluded that the proposed project **May Affect, and is Likely to Adversely Affect** [*insert species*], [*include all other species and affect calls for the project*]

FHWA is requesting formal consultation as allowed by 51 CFR 402.12(j). With submittal of this BA, FHWA has provided USFWS with all the best scientific and commercial data available concerning the impact of the proposed project on listed species.

FHWA understands that, as stipulated in ESA Section 7(b)(1)(A) and 50 CFR 402.14(e), formal consultation will be initiated by your receipt of this formal consultation request, and will conclude within 90 days from that date. We look forward to receiving a letter from you in 30 days concurring with our effect determinations. If no letter is received we will assume that you are in concurrence with the effect determinations. Additionally, we understand that a Biological Opinion will be prepared by USFWS within 45 days of completing the consultation period. FHWA request copies of the draft Biological Opinion, incidental take statement, terms and conditions, and reasonable and prudent measures for review prior to USFWS finalizing the Biological Opinion.

Enclosed are both a hard copy and an electronic version of the biological assessment. [*edit as necessary*]

If you have any questions about this project, or need additional clarification, please contact [*insert your name*], FHWA Area Engineer, at [*insert your phone number*].

[*Signed by Area Engineer*]

cc: *Name of environmental manager, WSDOT region*
 Name of area engineer, WSDOT region, title of area engineer
 Name of regional biology branch manager, WSDOT
 Corps liaison (if this is an FHWA project requiring a Corps permit)

20.0 Information on Listed Species

Contents

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20.0 Information on Listed Species

This chapter contains the following information:

- Listed species in Washington under USFWS and NOAA Fisheries jurisdiction
- Working with listed salmonids—considerations and resources
- Wildlife sensitive periods calendar
- Identification window for threatened and endangered plants in Washington
- Recovery plans

20.1 Listed Species in Washington under Jurisdiction of USFWS and NOAA Fisheries

Species lists can be obtained for species within Washington State from the following websites:

- NOAA Fisheries
<<http://www.nwr.noaa.gov/Species-Lists.cfm>>
- USFWS Western Washington
<<http://www.fws.gov/westwafwo/speciesmap.html>>
- USFWS Eastern Washington
<http://www.fws.gov/wafwo/species_EW.html>. Eastern Washington species lists can also be requested directly from the USFWS field office.

Species lists and listing information can also be found on the WSDOT Biology website at: <http://www.wsdot.wa.gov/Environment/Biology/BA/#SpeciesList>.

Left intentionally blank for future updates.

20.2 Working with Listed Salmonids—Considerations and Resources

Table 20-2. Generalized life history patterns of salmon, steelhead, and trout in the Pacific Northwest. ^a

	Adult Return	Spawning Location	Eggs in Gravel ^b	Young in Stream	Freshwater Habitat	Young Migrate Downstream	Time in Estuary	Time in Ocean	Adult Weight (Avg.)
COHO	Oct-Jan	Coastal streams, shallow tributaries	Oct-May	1+ yrs.	Tributaries, mainstem, slack water	Mar-Jul (2nd yr.)	Few days	2 yrs.	5-20 lbs. (8)
CHUM	Sep-Jan	Coastal rivers and streams lower reaches	Sep-Mar	Days-weeks	Little time in freshwater	Shortly after leaving gravel	4-14 days	2.5-3 yrs.	8-12 lbs. (10)
CHINOOK		Main stem of large and small rivers			Mainstem large and small rivers		Days-months	2-5 yrs.	
Spring	Jan-Jul		Jul-Jan	1+ yrs.		Mar-Jul (2nd yr.)			10-20 lbs. (15)
Summer	Jun-Aug		Sep-Nov	1+yrs.		Spring (2nd yr.)			10-30 lbs. (14)
Fall	Aug-Mar		Sep-Mar	3-7 months		Apr-Jun (2nd yr.)			10-40 lbs.
PINK	Jul-Oct	Main stem of large and small streams, tributaries, lower reaches	Aug-Jan	Days-weeks	Little time in freshwater	Dec-May	Few days	1.5 yrs.	3-10 lbs. (4)
SOCKEYE	Jul-Aug	Streams, usually near lakes	Aug-Apr	1-3 yrs.	Lakes	Apr-Jun (2nd-4th yr.)	Few days	1-4 yrs.	3-8 lbs. (6)
STEELHEAD ^c		Tributaries, streams, and rivers			Tributaries		Less than 1 month	1-4 yrs.	
Winter	Nov-Jun	Nov-Jun	Feb-Jul	1-3 yrs.		Mar-Jun (2nd-5th yr.)			5-28 lbs. (8)
Spring	Feb-Jun	Feb-Jun	Dec-May	1-2 yrs.		Spr & Sum (3rd-4th yr.)			5-20 lbs.
Summer (Col. R)	Jun-Oct	Jun-Oct	Feb-Jun	1-3 yrs.		Mar-Jun (of 3rd-5th yr.)			5-30 lbs. (8)
Summer (coastal)	Apr-Nov	Apr-Nov	Feb-Jul	1-2 yrs.		Mar-Jun (of 2nd-5th yr.)			5-30 lbs. (8)

^a There is much variation in life history patterns – each stream system having fish with their own unique timing and patterns of spawning, growth, and migration. Ask a local biologist about the specific patterns of the fish in your streams and update this chart for your area.

^b The eggs of most salmonids take 3-5 months to hatch at the preferred water temperature of 50-55 degrees F; steelhead eggs can hatch in 2 months.

^c Steelhead, unlike salmon, may not die after spawning. They can migrate back out to sea and return in later years to spawn again.

Adapted by Pacific States Marine Fisheries Commission. Sources: Ocean Ecology of North Pacific Salmonids, Bill Pearcy, University of Washington Press, 1992 Fisheries Handbook of Engineering Requirements and Biological Criteria, Milo Bell, U.S. Army Corps of Engineers, 1986; Adopting A Stream; A Northwest Handbook, Steve Yates, Adopt-A Stream Foundation, 1988.

a /ba manual 22- 20 0 information on listed species.doc

Left intentionally blank for future updates.

20.3 Online Resources for Species Information

Alaska Department of Fish and Game

<<http://www.adfg.state.ak.us/>>

American Fisheries Society

<<http://www.fisheries.org/>>

Background Soil Metals Concentrations for Washington State Publication #94-115

<<http://www.ecy.wa.gov/pubs/94115.pdf>>

Canada Department of Fisheries and Oceans

<<http://www.dfo-mpo.gc.ca/index.htm>>

Columbia River Websites

<<http://www.cbr.washington.edu/webgrp.html>>

Exempt Surface Waters List (table 3-5 in the WSDOT *Highway Runoff Manual*)

<<http://www.wsdot.wa.gov/Environment/WaterQuality/Runoff/HighwayRunoffManual>>

Joint Natural Resources Cabinet – Statewide Strategy to Recover Salmon

<<http://www.digitalarchives.wa.gov/governorlocke/gdro/strategy/strategy.htm>>

National Marine Fisheries Service, Anadromous Salmonid Passage Design

<http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish_Passage_Design.pdf>

National Oceanic and Atmospheric Administration, Fisheries Service–Northwest Fisheries Science Center

<<http://www.nwfsc.noaa.gov/>>

National Oceanic and Atmospheric Administration, Fisheries Service–Northwest Region

<<http://www.nwr.noaa.gov/>>

National Oceanic and Atmospheric Administration, Fisheries Service– Office of Sustainable Fisheries

<<http://www.nmfs.noaa.gov/sfa/index.htm#achieve>>

NatureServe, Plant and Ecological Community Encyclopedia

<<http://www.natureserve.org/explorer>>

Northwest Indian Fisheries Commission

<<http://nwifc.wa.gov/>>

Northwest Power and Conservation Council, Subbasin Recovery Planning
<<http://www.nwcouncil.org/fw/subbasinplanning/Default.htm>>

ORCA Network, Marine Mammal Sightings
<<http://www.orcanetwork.org/>>

Oregon Department of Fish and Wildlife
<<http://www.dfw.state.or.us/>>

Pacific Fishery Management Council–EFH, Appendix A of Amendment 14
<http://www.psmfc.org/efh/salmon_efh.html>

Reef Environmental Education Foundation (REEF), Diver and Marine Survey Resource
<<http://www.reef.org/>>

Salmon Recovery Planning
<<http://www.nwr.noaa.gov/Salmon-Recovery-Planning/ESA-Recovery-Plans/Draft-Plans.cfm>>

Seattle Audobon Society, BirdWeb, Birds of Washington
<<http://www.birdweb.org/birdweb/index.aspx>>

Snohomish County – Surface Water On-line Data
<http://198.238.192.103/spw_swhydro/wq-search.asp>

Streamnet – The northwest aquatic information network
<<http://www.streamnet.org/>>

U.S. Environmental Protection Agency, Water Quality Standards
<<http://www.epa.gov/waterscience/standards/>>

U.S. Fish and Wildlife Service, Endangered Specis Program
<<http://www.fws.gov/endangered/>>

U.S. Fish and Wildlife Service, home page
<<http://www.fws.gov/>>

U.S. Fish and Wildlife Service, Species Recovery Plans
<<http://www.fws.gov/endangered/species/recovery-plans.html>>

U.S. Fish and Wildlife Service and NOAA Fisheries Section 7 Consultation Handbook
<http://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section7_handbook.pdf>

U.S. Geoloigal Survey, National Water Quality Assessment Program – Data Warehouse
<<http://infotrek.er.usgs.gov/apex/f?p=NAWQA:HOME:0>>

U.S. Geological Survey, Water Science Center

<<http://wa.water.usgs.gov/index.html>>

U.S. Army Corps of Engineers–Northwest Division

<<http://www.nwd.usace.army.mil/>>

Washington State Conservation Commission, Watershed Data

<<http://www.scc.wa.gov/index.php/Watershed-Data/>>

Washington State Department of Ecology

<<http://www.ecy.wa.gov/>>

Washington State Department of Ecology, 303d List

<<http://www.ecy.wa.gov/programs/wq/303d/index.html>>

Washington State Department of Ecology, Environmental Information Management

<<http://www.ecy.wa.gov/eim/>>

Washington State Department of Ecology, River and Stream Water Quality Monitoring

<http://www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html>

Washington State Department of Ecology, Stormwater Management

<<http://www.ecy.wa.gov/programs/wq/stormwater/index.html>>

Washington State Department of Ecology, Water Quality Assessment

<<http://www.ecy.wa.gov/programs/wq/303d/2002/2002-index.html>>

Washington State Department of Ecology, Water Quality Standards

<<http://www.ecy.wa.gov/programs/wq/swqs/new-rule.html>>

Washington State Department of Fish and Wildlife, Aquatic Habitat Guidelines

<<http://wdfw.wa.gov/hab/ahg/index.htm>>

Washington State Department of Fish and Wildlife, Fish Passage Technical Assistance

<<http://wdfw.wa.gov/hab/engineer/cm/>>

Washington State Department of Fish and Wildlife, Fish and Shellfish Science

<<http://wdfw.wa.gov/conservation/fisheries/>>

Washington State Department of Fish and Wildlife, Priority Habitats and Species

<<http://wdfw.wa.gov/hab/phspage.htm>>

Washington State Department of Fish and Wildlife, Salmonscape

<<http://wdfw.wa.gov/mapping/salmonscape/index.html>>

- Washington State Department of Natural Resources, Natural Heritage Program homepage
<http://www.dnr.wa.gov/ResearchScience/Topics/NaturalHeritage/Pages/amp_nh.aspx>
- Washington State Department of Transportation, Highways and Local Programs, Environmental Policy
<<http://www.wsdot.wa.gov/LocalPrograms/Environment/>>
- Washington State Department of Transportation, Highway Runoff Manual
<<http://www.wsdot.wa.gov/Environment/WaterQuality/Runoff/HighwayRunoffManual>>
- Washington State Department of Transportation, NPDES Progress Reports
<<http://www.wsdot.wa.gov/Environment/WaterQuality/default.htm#reports>>
- Washington State Department of Transportation, Stormwater
<<http://www.wsdot.wa.gov/Environment/Biology/BA/BAGuidance.htm#Stormwater>>
- Washington State Recreation and Conservation Office
<http://www.rco.wa.gov/salmon_recovery/index.shtml>
- Wild Whales, BC Cetaceans Sighting Network
<<http://wildwhales.org/>>

20.4 What Constitutes Harm to Endangered and Threatened Wildlife and Plants Under the ESA?

From NOAA Fisheries, NOAA, and Dept. of Commerce,
A final rule in the Federal Register, 8 November 1999 (Volume 64, Number 215)

Summary:

This final rule defines the term “harm”, which is contained in the definition of *take* in the Endangered Species Act. The purpose of this rulemaking is to clarify the type of harm that may result in a *take* of a listed species under the ESA. This is not a change in existing law. It provides clear notification to the public that habitat modification or degradation may harm listed species and, therefore, constitutes a *take* under the ESA as well as ensuring consistency between NOAA Fisheries and USFWS. This rule defines the term “harm” to include any act, which actually kills or injures fish or wildlife. Such acts may include significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife.

Activities That May Constitute a *take*:

A principle purpose of this final rule is to provide clear notification to parties that habitat modification or degradation may harm listed species and, therefore, constitute a *take* under the ESA. The following list identifies several examples of habitat-modifying activities that may fall within the scope of this final rule when these or similar activities cause death or injury to fish or wildlife, including those activities that significantly impair essential behavioral patterns of listed species. In all instances a causal link must be established between the habitat modification and the injury or death of listed species. This list is not exhaustive:

- Constructing or maintaining barriers that eliminate or impede a listed species’ access to habitat or ability to migrate.
- Discharging pollutants, oil, toxic chemicals, radioactivity, carcinogens, mutagens, teratogen, or organic nutrient-laden water including sewage water into a listed species’ habitat.
- Removing, poisoning, or contaminating plants, fish, wildlife, or other biota required by the listed species for feeding, sheltering, or other essential behavioral patterns.
- Removing or altering rocks, soil, gravel, vegetation, or other physical structures that are essential to the integrity and function of a listed species’ habitat.

- Removing water or otherwise altering streamflow when it significantly impairs spawning, migration, feeding, or other essential behavioral patterns.
- Releasing non-indigenous or artificially propagated species into a listed species' habitat or where they may access the habitat of a listed species.
- Constructing or operating dams or water diversion structures with inadequate fish screens or fish passage facilities at dams or water diversion structures in a listed species' habitat.
- Constructing, maintaining, or using inadequate bridges, roads, or trails on stream banks or unstable hill slopes adjacent or above a listed species' habitat.
- Conducting timber harvest, grazing, mining, earth moving or other operations, which result in substantially increased sediment input into streams.
- Conducting land-use activities in riparian areas and areas susceptible to mass wasting and surface erosion, which may disturb soil and increase sediment delivered to streams, such as logging, grazing, farming, and road construction.

20.5 Considerations for Projects That May Have Fisheries Impacts

- Projects that have *no effect* or are *not likely to adversely affect* listed or proposed go through the agency review process much faster and smoother than projects that will result in an adverse effect. Projects that restrict in-water work within the appropriate work window will minimize impacts on fish species, and will be more likely to have a "not likely to adversely affect" call. Work in systems that have listed resident fish species such as bull trout or steelhead may not have an impact-free window.
- Minimize the impacts from the project by obtaining a hydraulic project approval (HPA) permit from the Washington Department of Fish and Wildlife (WDFW), and include the conditions of the HPA in the BA impact minimization measures.
- Projects requiring new culverts or other fish-friendly engineering should use WDFW guidelines. WDFW Habitat and Lands Program, Environmental Engineering Division is a good source for engineering information. *Fish Passage Design at Road Culverts: A Design Manual*

for *Fish Passage at Road Crossings* can be obtained on the WDFW website: <<http://wdfw.wa.gov/hab/engineer/cm/>>.

- Projects that include in-water work, such as slope stabilization in stream or river systems, should follow the *Integrated Streambank Protection Guidelines*, which is published by WDFW and can be obtained on the WDFW website: <<http://wdfw.wa.gov/hab/ahg/strmbank.htm>>.
- Projects that require the placement of riprap within the ordinary high water mark minimize impacts by covering an equal or larger area of riprap and restoring the stream channel in close proximity to the new riprap. Replacement of existing riprap with new riprap should include design criteria from the *Integrated Streambank Protection Guidelines* (WDFW).
- Stormwater impacts must be considered in the BA. Projects should follow the guidance of an approved stormwater manual. Items which require special consideration include treatment to remove contaminants and release rates. The stormwater guidance provided in the WSDOT Instructional Letter (Section 5.6) should be followed when possible.
- Best management practices (BMPs) for erosion and sedimentation control, spill cleanup plans, etc., for the project should come from a Department of Ecology approved plan for erosion control, spill prevention, stormwater, or the WSDOT *Highway Runoff Manual*. The need to follow these manuals can be listed as a recommendation in the BA. In many cases, these manuals are already being used.

Example:

A temporary erosion and sedimentation control (TESC) plan in accordance with the WSDOT *Highway Runoff Manual* will be developed and implemented for all projects requiring grading, ditching, filling, embankment compaction, or excavation. The best management practices in the plan will be used to control sediments from all vegetation or ground disturbing activities.

20.6 Wildlife Sensitive Periods Calendar

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Gray Wolf Mating/Denning		–	–	–	–	–	–	–				
Gray Wolf Rendezvous							–	–	–	–	–	
Grizzly Bear Hibernation/Denning	–	–	–	30th							15th	–
Marbled Murrelet Pre-alternate molt (retain flight)		15th	–	–	15th							
Marbled Murrelet Pre-basic molt (flightless)*							15th	–	–	–	–	30th
Marbled Murrelet Nesting – Early				1st	–	–	–	5th				
Marbled Murrelet Nesting – Late								6th	15th			
N. Spotted Owl Nesting – Early			1st	–	–	–	15th					
N. Spotted Owl Nesting – Late							16th	–	30th			
Sea Turtles Summer Use						–	–	–	–	–		
W. Snowy Plover Breeding				1st	–	–	–	31st				
W. Snowy Plover Migrating				15th	15th				15th	15th		

* During this period, individuals are flightless for approximately 2 months. Some indication that the pre-basic molt stage occurs from mid-July through the end of August in Washington State.

20.7 Identification Window for Threatened and Endangered Plants in Washington

Dates provided are approximate and vary by locale.

Common Name	Scientific Name	Federal Status*	Apr	May	June	July	Aug	Sept	Oct
Bradshaw's desert parsley	<i>Lomatium bradshawii</i>	E	15 X	X 15					
Golden paintbrush	<i>Castilleja levisecta</i>	T	20X	X	X	X10			
Kincaid's lupine	<i>Lupinus sulphureus</i> var. <i>kincaidii</i>	T	X	X	X	X			
Marsh sandwort	<i>Arenaria paludicola</i>	E		X	X	X	X		
Nelson's checker mallow	<i>Sidalcea nelsoniana</i>	T		15 X	X	X	X		
Northern wormwood	<i>Artemisia campestris</i> ssp. <i>borealis</i> var. <i>wormskioldii</i>	C	X						
Spalding's catchfly	<i>Silene spaldingii</i>	T					X		
Showy stickseed	<i>Hackelia venusta</i>	E		X	X	X			
Umtanum desert buckwheat	<i>Eriogonum codium</i>	C		X	X	X	X		
Ute ladies' tresses	<i>Spiranthes diluvialis</i>	T				X	X	X	?
Water howellia	<i>Howellia aquatilis</i>	T		25 X	X	X			
Wenatchee Mountains checker-mallow	<i>Sidalcea oregana</i> var. <i>calva</i>	E			X	X			
White Bluffs bladder-pod	<i>Physaria tuplashensis</i>	C			X	X			

* Abbreviated as follows:

- E Endangered
- C Candidate species for listing
- P Proposed species for listing
- T Threatened

20.8 Recovery Plans

The following website is an invaluable resource for locating and downloading several existing recovery plans: <<http://www.fws.gov/endangered/species/recovery-plans.html>>. The plans available at this online source (from the years 1978 through 2010) that are most applicable to projects located in Washington State are as follows:

- 5/20/09—U.S. Fish and Wildlife Service. 2009. Short-tailed albatross (*Phoebastria albatrus*) Final Recovery Plan. Anchorage, Alaska.
- 5/20/10. Final Recovery Plan for the Prairie Species of Western Oregon and Southwestern Washington. Fender's blue butterfly (*Icaricia icarioides fenderi*), *Erigeron decumbens* var. *decumbens* (Willamette daisy), *Lomatium bradshawii* (Bradshaw's lomatium), *Lupinus sulphureus* ssp. *kincaidii* (Kincaid's lupine), *Sidalcea nelsoniana* (Nelson's checker-mallow).
- 9/15/10—U.S. Fish and Wildlife Service. 2010 Draft Revised Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*). 178 pp.
- 1/24/08—National Marine Fisheries Service. 2008. Recovery plan for Southern Resident killer whales (*Orcinus orca*). National Marine Fisheries Service, Northwest Region, Seattle, Washington. 251 pp.
- 12/12/2007—U.S. Fish and Wildlife Service. 2007. Recovery plan for *Hackelia venusta* (Showy Stickseed). Portland, Oregon. xii + 60 pp.
- 10/12/2007—U.S. Fish and Wildlife Service. 2007. Recovery plan for *Silene spaldingii* (Spaulding's catchfly). Portland, Oregon. + 187 pp.
- 9/20/2007—U.S. Fish and Wildlife Service. 2007. Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (*Charadrius alexandrinus nivosus*). Sacramento, California. In two volumes. xiv + 751 pp.
- 09/07/07—U.S. Fish and Wildlife Service. 2006. Draft recovery plan for the Columbia Basin Distinct Population Segment of the Pygmy Rabbit (*Brachylagus idahoensis*). Portland, Oregon. 132 pp.
- 09/18/06—U.S. Fish and Wildlife Service. 2006. Final Recovery Plan for the Newcomb's Snail (*Erinna newcombi*). Portland, Oregon. 61 pp.
- 06/--/06—National Marine Fisheries Service. 2006. Proposed Upper Columbia Spring Chinook salmon, Steelhead, and Bull Trout Recovery Plan. Upper Columbia Salmon Recovery Board.

- 02/24/06—U.S. Fish and Wildlife Service. 2006. Revised Grizzly Bear Recovery Plan. 204 pp.
- 07/22/04—U.S. Fish and Wildlife Service. 2004. Recovery Plan for Wenatchee Mountains Checker-mallow. Portland, Oregon. 64 pp.
- 07/01/04—U.S. Fish and Wildlife Service. 2004. Bull Trout: Coastal-Puget Sound DPS Draft Recovery Plan. Volume 1 – Puget Sound Management Unit. Portland, Oregon. 410 pp.
- 07/01/04—U.S. Fish and Wildlife Service. 2004. Bull Trout: Coastal-Puget Sound DPS Draft Recovery Plan. Volume 2 – Olympic Peninsula Management Unit. Portland, Oregon. 297 pp.
- 08/22/01—Revision; U.S. Fish and Wildlife Service. 2001. Oregon Silverspot Butterfly Revised Recovery Plan. Portland, Oregon. 121 pp.
- 08/23/00—U.S. Fish and Wildlife Service. 2000. Recovery Plan for the Golden Paintbrush (*Castilleja levisecta*). U.S. Fish and Wildlife Service, Portland, Oregon. 51 pp.
- 12/01/98—Revision; National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Populations of the Olive Ridley Turtle (*Lepidochelys olivacea*). National Marine Fisheries Service, Silver Spring, Maryland.
- 12/01/98—Revision; National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Populations of the Loggerhead Turtle (*Caretta caretta*). National Marine Fisheries Service, Silver Spring, Maryland.
- 12/01/98—Revision; National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Populations of the Leatherback Turtle (*Dermochelys coriacea*).
- 12/01/98—Revision; National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*).
- 09/28/98—Final; U.S. Fish and Wildlife Service. 1998. Recovery Plan for Marsh Sandwort (*Arenaria paludicola*) and Gambel's Watercress (*Rorippa gambelii*). U.S. Fish and Wildlife Service, Portland, Oregon. 50 pp. + appendices.

- 09/24/97—Final; U.S. Fish and Wildlife Service. 1997. Recovery Plan for the Threatened Marbled Murrelet (*Brachyramphus marmoratus*) in Washington, Oregon, and California. Portland, Oregon. 203 pp.
- 03/04/94—Revision; U.S. Fish and Wildlife Service. 1994. Recovery Plan for Woodland Caribou in the Selkirk Mountains. Portland, Oregon. 79 pp.
- 09/10/93—Revision; U.S. Fish and Wildlife Service. 1993. Grizzly Bear Recovery Plan. Missoula, Montana. 181 pp.
- 08/13/93—U.S. Fish and Wildlife Service. 1993. Bradshaw’s Lomatium Recovery Plan. Portland, Oregon. 52 pp.
- 04/06/92—Final; U.S. National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1992. Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C. 65 pp.
- 12/26/91—Final; U.S. National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991. Recovery Plan for U.S. Population of Loggerhead Turtle. National Marine Fisheries Service, Washington, D.C. 64 pp.
- 08/03/87—U.S. Fish and Wildlife Service. 1987. Northern Rocky Mountain Wolf Recovery Plan. Denver, Colorado. 146 pp.
- 06/14/83—Revision; U.S. Fish and Wildlife Service. 1983. Columbia White-tailed Deer Recovery Plan. Portland, Oregon. 86 pp.

As referenced above, several of the recovery plans were jointly written by the USFWS and NOAA Fisheries. Some recovery plans are available only online, on the NOAA Fisheries website at <http://www.nmfs.noaa.gov/prot_res/PR3/recovery.html>.

The plans available on this website that are most applicable to projects occurring in Washington State are as follows:

- Recovery plan for Southern Resident killer whales (*Orcinus orca*), January 2008.
- Draft Revised Steller Sea Lion Recovery Plan, May 2007.
- 06/__/06— National Marine Fisheries Service. 2006. Draft Recovery Plan for the Fin Whale (*Balaenoptera physalus*). Silver Spring Maryland. 78 pp.

- 06/__/06– National Marine Fisheries Service. 2006. Draft Recovery Plan for the Sperm Whale (*Physeter macrocephalus*). Silver Spring Maryland. 92 pp.
- Final Recovery Plan for the Humpback Whale, November 1991

In addition, several recovery plans are in development for Pacific Northwest Salmonids. Information on these plans is available on the NOAA Fisheries website:

<<http://www.nwr.noaa.gov/Salmon-Recovery-Planning/ESA-Recovery-Plans/Draft-Plans.cfm>>.

- 5/29/09–National Marine Fisheries Service. 2009. Final Recovery Plan for Lake Ozette Sockeye Salmon adopted by NMFS.
- 9/24/08–National Marine Fisheries Service. 2009. Final Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan adopted by NMFS.
- 10/09/07–National Marine Fisheries Service. 2007. Final Upper Columbia River Spring Chinook Salmon and Steelhead Recovery Plan adopted by NMFS.
- 05/24/07–National Marine Fisheries Service. 2007. Final Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan adopted by NMFS.
- 01/19/07–National Marine Fisheries Service. 2007. Final Puget Sound Chinook Salmon Recovery Plan. Shared Strategy Development Committee, Seattle Washington. Volumes 1 and 2. Adopted by NMFS.
- 12/29/10. Draft Framework for Ranking Recovery Potential of Puget Sound Chinook Populations. Currently in review.
- 03/14/06–National Marine Fisheries Service. 2006. Draft Snake River Salmon Recovery Plan for Southeast Washington. A Recovery Plan for all listed Snake River salmonids is planned for publication in May 2011.
- 10/20/10. Proposed Willamette Salmon and Steelhead Recovery Plan. Public comment period closed 12/21/10.

21.0 References

21.0 References

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22.0 Glossary and Abbreviations

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Definitions are provided below for regulatory, administrative, and technical terms used in biological assessments and the ESA Section 7 consultation process, followed by a list of abbreviations used in this manual.

22.1 Glossary

A-weighting — A frequency-weighting method in which the sound levels are adjusted to approximate the frequency range of human hearing (commonly shown as dBA for A-weighted decibels).

action (50 CFR 402.02) — Any activity or program 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. Examples include but are not limited to actions directly or indirectly causing modifications to the land, water, or air; actions intended to conserve listed species or their habitat; and the promulgation of regulations.

action agency — The federal agency proposing to undertake a major construction project (action).

action area — 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).

affect/effect — To *affect* (a verb) is to bring about a change (example: The proposed action is likely to adversely affect piping plovers nesting on the shoreline). The *effect* (usually a noun) is the result (example: The proposed highway is likely to have the following effects on the Florida scrub jay). *Affect* appears throughout Endangered Species Act Section 7 regulations and documents in the phrases *may affect* and *likely to adversely affect*. *Effect* appears throughout Section 7 regulations and documents in the phrases *adverse effects*, *beneficial effects*, *effects of the action*, and *no effect*.

air gun — A device used in underwater seismic surveys that uses air under pressure to produce loud sound levels.

ambient sound level — The background sound level, which is a composite of sound from all sources near and far.

attenuation — See *transmission loss*.

audiogram — A graphical representation of the frequency range and minimum decibel level capable of being heard by different species in units of sound pressure.

baseline — The starting point for analysis; ambient conditions from which to measure and compare potentially altered conditions caused by project activities.

batched biological assessment — A biological assessment that provides collective coverage for groups of similar types of projects or for projects that take place in a similar geographic location.

batched biological evaluation — The term used by U.S. Army Corps of Engineers for informal biological assessment.

beneficial effects — Contemporaneous positive effects without any adverse effects on the species or habitat. By definition, beneficial effects cannot be considered to have *no effect*.

best management practices (BMPs) — Methods, facilities, built elements, and techniques implemented or installed during project construction to reduce short- and long-term project impacts on listed and sensitive species and habitat. These measures are included as part of the federal agency's proposed action.

biofiltration — The process of filtering water through biological materials, such as vegetation.

bioinfiltration — The process of infiltrating water through biological materials, such as vegetation.

biological assessment — The information prepared by or under the direction of an action agency to determine whether a proposed action (major construction activity) is likely to affect listed and proposed species and designated and proposed critical habitat that may be present in the project action area, including the evaluation of potential effects of the action on such species and habitat. The outcome of the biological assessment (BA) determines whether formal consultation or a conference is necessary.

biological opinion — The document prepared by the U.S. Fish and Wildlife Service or NOAA Fisheries that states the opinion of the Service as to whether a federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

bioretention — The process of temporarily retaining water in a natural terrestrial community of plants, microbes, and soil.

candidate species — A species for which the Service has on file sufficient information on biological vulnerability and threats to support a proposal to list it as threatened or endangered. Until a proposed rule is issued to list a candidate species, authors of biological assessments are not required to address the species, although it is recommended.

coalescing plates — A device with parallel plates to separate oil from water by means of gravity.

community noise level — See *environmental noise level*.

compost — Organic residue, or a mixture of organic residues and soil, that has undergone biological decomposition until it has become relatively stable humus.

conference — A process of early interagency cooperation involving discussions between an action agency and the Services pursuant to Section 7(a)(4) of the Endangered Species Act regarding the likely impact of the agency's proposed action on proposed species or critical habitat. Conferences are intended to help identify and resolve potential conflicts between an action and species conservation early in project planning, and to develop recommendations to minimize or avoid adverse effects (50 CFR 402.02, 50 CFR 402.10).

conservation measure (CM) — Activities or measures that help recover listed species.

critical habitat — Specific geographical areas that possess physical or biological features that are essential to the conservation of listed species. These designated areas may require special management consideration or protection.

cumulative effects — The effects of other, future state or private actions that are reasonably certain to occur within the federal project action area (50 CFR 402.02). (This definition of cumulative effects is different from the one provided under NEPA.)

cylindrical spreading — The spreading (of sound) in a cylindrical or tubular form from the source.

decibel (dB) — A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for water is 1 micro pascal (μPa) and air is 20 micro pascals (the threshold of healthy human audibility).

delayed mortality — When a fish dies more than 1 hour and less than 48 hours after removal from the fish cage.

delayed mortality zone — The radius around a pile being driven where the peak sound pressure level and impulse are not great enough to result in immediate death, but result in mortality several hours to several days later.

detention — The temporary storage of runoff, which is released at a slower rate than it was collected. Detention facilities are most commonly used for flow control.

direct effects — Impacts resulting from the proposed action.

discountable effects — Potential effects of a proposed action that are extremely unlikely to occur. Based on best judgment, a person would not expect discountable effects to occur.

distinct population segment (DPS) — A designation used by the U.S. Fish and Wildlife Service for a discrete vertebrate stock that is treated as an individual species (e.g., a specified seasonal

fish run in a particular river). This is equivalent to the NOAA Fisheries evolutionarily significant unit (ESU) classification.

drywell — A well completed above the water table so that its bottom and sides are typically dry except when receiving fluids. Drywells are designed to disperse water below the land surface and are commonly used for stormwater management in eastern Washington.

ecology embankment — A stormwater treatment facility constructed in the pervious shoulder area of a highway, consisting of a vegetation-covered French drain containing filter media.

effect/affect — See *affect/effect*.

effects of the action — The direct and indirect effects of a federal action on listed species or critical habitat, together with the effects of other interrelated and interdependent activities. Direct effects are those resulting from the proposed action. Indirect effects are those caused by the proposed action later in time, but still reasonably certain to occur. Interrelated actions are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

endangered species — A species that is in danger of extinction throughout all or a significant portion of its range.

environmental noise level — The normal or existing level of environmental sound at a given location, in the absence of traffic.

evolutionarily significant unit (ESU) — A designation used by NOAA Fisheries for certain local salmon populations or runs that are treated as individual species. This is equivalent to the U.S. Fish and Wildlife Service distinct population segment (DPS) classification.

federal action agency — The federal agency that proposes a specific action or triggers a federal nexus for a project (by providing permits, funding, etc.). This agency is responsible for formally submitting a biological assessment for the proposed action to the Services for review and informal or formal consultation.

federal nexus — A project with a federal nexus either has federal funding, requires federal permits, or takes place on federal lands.

filter strip — A grassy area with gentle slopes that treats stormwater runoff from adjacent paved areas before it can concentrate into a discrete channel.

formal consultation — The process between the Services and the action agency that commences with the action agency's written request for consultation under Section 7(a)(2) of the Endangered Species Act (ESA) and concludes with the Service's issuance of a biological opinion under Section 7(b)(3) of the ESA.

frequency — The number of times per second that the sine wave of sound repeats itself, or that the sine wave of a vibrating object repeats itself. Now expressed in hertz (Hz), formerly in cycles per second (cps).

frequency spectrum — Distribution of sound pressure versus frequency for a waveform, dimension in root mean square (RMS) pressure and defined frequency bandwidth.

gas bladder — An air-filled sac located between the alimentary canal and the kidneys. It is filled with CO₂, O₂ and N₂ in different proportions than found in air, also called the swimbladder. It is functionally a hydrostatic organ to help control buoyancy, but also plays an important role in sound reception in some species of fish.

hair cells — Cells within the inner ear of most vertebrates that contain ciliary bundles that respond to sound pressure and create the sensation of hearing.

harass (50 CFR Part 17) — An intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying to such an extent as to significantly disrupt normal behavior patterns, which include but are not limited to breeding, feeding, and sheltering.

hard site conditions — Areas where there is no excess ground-effect noise attenuation, such as asphalt, concrete, hard-packed soils, and water surfaces.

harm (50 CFR Part 17) — In the definition of *take* in the Endangered Species Act. Harm is defined by the USFWS to include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, and sheltering (50 CFR 17.3). NMFS' definition of harm includes significant habitat modification or degradation where it actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, spawning, migrating, rearing, and sheltering (64 FR 60727, November 8, 1999).

hertz (Hz) — Frequency or cycles per second; the number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz, and ultrasonic sounds are above 20,000 Hz.

hydrophone — An underwater microphone.

impervious surface — A hard surface area that either prevents or retards the entry of water into the soil and from which water runs off at an increased rate of flow.

impulse — The time integral of the peak pressure, typically described in units of pounds per square inch per millisecond (psi/msec). It recognizes that a short pulse may do less damage than a longer duration pulse of the same pressure. Sound pressure is equivalent to kilowatts, while impulse is equivalent to kilowatt-hours.

incidental take — A *take* of listed species that results from an action but is not the direct purpose or intent of the action, as defined under the Endangered Species Act. Incidental *take* can be

authorized through Section 7 consultation or through Section 10 conservation planning, such as a habitat conservation plan (HCP).

indirect effects — Effects caused by the proposed action later in time but still reasonably certain to occur.

infiltration — The downward movement of water from the surface to the subsoil.

infiltration pond — A facility that contains excess runoff then percolates that runoff into the surrounding soil.

informal consultation — There may be two types: 1) an optional process that includes all discussions and correspondence between the Service and the action agency or designated nonfederal representative prior to formal consultation (if determined to be necessary), or 2) the process initiated either to notify the Services of a no-effect determination, or to secure concurrence from the Services for a project that may affect but is not likely to adversely affect listed species or critical habitat.

insignificant effects — Effects that should never reach the scale where *take* occurs. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects.

interdependent action — An action having no independent utility apart from the proposed action.

interrelated action — An action that is part of a larger action and depends on the larger action for its justification.

is likely to jeopardize the continued existence of a proposed species or adversely modify proposed critical habitat — When the action agency or the Services identify conditions where the proposed action has this result, a conference is required.

is not likely to adversely affect — The appropriate finding in a biological assessment (or conclusion during informal consultation) when effects on listed species are expected to be discountable, insignificant, or completely beneficial.

jeopardize the continued existence of — To engage in an action that reasonably would be expected to directly or indirectly reduce the likelihood of both survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

jeopardy (50 CFR 402.02) — Classification given to an action that reasonably would be expected to directly or indirectly reduce the likelihood of both survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

kilojoule (kJ) — The basic unit of force moving a body a unit distance in the metric system is 1 newton-meter or 1 joule. One joule is 0.7376 foot-pounds. A thousand joules (or 1 kilojoule) is represented as kJ.

lagena — One of three symmetrically paired structures in the inner ear of fishes associated with the bony otolith. In most species, the lagena detects acoustic pressure and acoustical particle motion.

Leq — The Equivalent sound pressure level – the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.

line source of noise — A source of noise spread out into a line, such as the combined traffic on a roadway.

listed species — Any species of wildlife, fish, or plant that has been listed as endangered or threatened under Section 4 of the Endangered Species Act. Listed species are found in 50 CFR 17.11–17.12. Under the statute, the two types of species are treated in virtually the same way.

Lmax — The maximum sound level, in decibels, that occurs during a single event.

major construction activity — A construction project (or other undertaking having similar physical effects) that is a major federal action significantly affecting the quality of the human environment, as referred to in the National Environmental Policy Act (NEPA, 42 USC 4332 (2)(c)).

may affect, likely to adversely affect — The appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect on listed species may directly or indirectly result from the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. If the overall effect of the proposed action is beneficial to the listed species but is also likely to cause some adverse effects, then the proposed action is *likely to adversely affect* the listed species. If incidental *take* is anticipated to result from the proposed action, a determination of *likely to adversely affect* should be made, requiring initiation of formal Section 7 consultation.

may affect, not likely to adversely affect — The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial.

mean lower low water — Zero tidal elevation. Minus tides are below MLLW.

media filter — A filter that includes one of multiple media for removing pollutants such as compost, gypsum, perlite, zeolite, or activated carbon.

micro pascal (μPa) — Most underwater acoustic sound pressure measurements are stated in terms of a pressure relative to 1 micro pascal.

millisecond (msec) — One-thousandth of a second.

minimization measure — Measures that reduce the impact of the project on listed species.

mortality (fish) — Cessation of all activity including movements of the operculum, or when all respiration stops and the fish lies motionless.

National Pollutant Discharge Elimination System (NPDES) — The provision in the federal Clean Water Act that requires point source dischargers of pollutants to obtain permits, called NPDES permits. In Washington state, NPDES permits are administered by the Department of Ecology.

no effect — The appropriate conclusion when the proposed action will not affect a listed species or its critical habitat (i.e., will have no effect whatsoever—neither beneficial effects, nor highly improbable effects, nor insignificant effects).

occupied critical habitat — Critical habitat that contains individuals of the species at the time of the project analysis. A species does not have to occupy critical habitat throughout the year for the habitat to be considered occupied (e.g., migratory birds). Subsequent events affecting the species may result in this habitat becoming unoccupied.

outfall — The point of water discharge from a stormwater facility.

overpressure — A positive pressure above ambient levels.

pascal (Pa) — A unit of pressure equal to 1 newton per square meter.

peak (sound) — The absolute peak sound level measured during an event.

peak sound pressure (unweighted), dB re 1 μ Pa — The peak sound pressure level based on the largest absolute value of the instantaneous sound pressure over the frequency range from 20 Hz to 20,000 Hz. This pressure is expressed here as a decibel (referenced to a pressure of 1 μ Pa) but can also be expressed in units of pressure, such as μ Pa or PSI.

performance-based biological assessment — A type of biological assessment usually written early in the design phase of a project. Because detailed information on the project description and design is lacking at that stage, they establish habitat and species safeguards by defining actions that will not be included in the project or impacts that will be avoided.

performance measure — An observable or measurable benchmark for a particular performance objective against which a project can be compared. If the standards are met, the related performance objectives are considered to have been fully achieved. It is something quantifiable. Standards should be measures, not actions, and should be: 1) achievable, and 2) capable of being monitored.

physoclistus fish species — See *physostomus*.

physostomus fish species — A species in which the swim bladder is connected to the esophagus by a thin tube. Air to fill the swim bladder is swallowed by the fish and directed to the swim bladder. Air removal from the swim bladder is by expulsion through this tube to the esophagus. Physoclistus fishes have no such connection. Instead, they add gas to the swim bladder using a highly specialized gas secreting system called the rete mirabile, which lies in the wall of the swim bladder and extracts gas from the blood using a counter-current system, much like that found in the kidney to remove wastes from the blood. Removal of gas from the swim bladder occurs by reabsorption into the blood.

pile-driving time — The number of minutes to drive a second section pile to its predetermined elevation.

piscivorous animal — A fish-eating animal.

point source noise — A noise whose source is more or less concentrated at a single point, such as construction noise or a single vehicle heard from a distance.

predation — The act of preying on another animal.

programmatic biological assessment — A biological assessment that establishes conditions allowing specific activities that occur within general programs to proceed without individual concurrence from the Service (or allowing a shortened concurrence timeline).

programmatic biological evaluation — Term used by U.S. Army Corps of Engineers for an informal programmatic biological assessment.

propagation loss — The decrease in sound pressure level due to the spherical spreading of the sound wave. In the farfield, the rate of decrease in the sound pressure level is proportional to the distance, or $1/r$. In an unbounded, homogeneous medium, propagation loss is on the order of 6 dB for every doubling of the distance.

proposed species — Any species of wildlife, fish, or plant that is proposed in the Federal Register to be listed under Section 4 of the ESA as threatened or endangered.

range (of a species) — The area or region over which an organism occurs.

rate — Percentage probability of an effect.

reasonable and prudent measures — Actions that the Services believe are necessary and appropriate to minimize the impacts (amount or extent) of incidental *take*. These measures are communicated to an action agency in a biological opinion issued by the Service.

receiving water — A body of water or a surface water system to which surface runoff is discharged.

receptor (noise) — The object or perceiver that receives or responds to a sound.

recovery — Action that is necessary to reduce or resolve the threats that caused a species to be listed as threatened or endangered.

retention — The permanent collection and holding of stormwater runoff. Retention facilities are most commonly used for pollutant removal.

rise time — The time interval a signal takes to rise from 10 percent to 90 percent of its highest peak.

RMS impulse (root mean square) — Root square of the energy divided by the duration. It is the mean square pressure level of the pulse of sound from a strike of the hammer on a pile. It is described as the average pulse pressure and accepted as the reaction threshold for whales to seismic signals. RMS impulse is expressed in dB re 1 micro pascal. It is the unweighted root mean square sound level (20 Hz to 20 kHz) in dB re 1 μ Pa averaged over the duration of an impulse of sound.

root mean square (RMS) — The average of the squared pressures over the time that comprise that portion of the waveform containing 90 percent of the sound energy for one pile-driving impulse, commonly used in repetitive or relatively continuous measurements such as in speech or highway noise. It is not applicable to transient signals such as explosions. It is used in calculating longer-duration sound pulses such as a pile-driving pulse of sound.

sacculus — One of three symmetrically paired structures in the inner ear of fishes associated with the bony otolith. In most species the sacculus detects acoustic pressure and acoustical particle motion. This is where the hair cells are located.

sand filter — A manmade depression or basin with a layer of sand that treats (removes pollutants from) stormwater as it percolates through the sand and is discharged via a central collector pipe.

the Services — Abbreviated term for the U.S. Fish and Wildlife Service and NOAA Fisheries.

soft site conditions — Areas such as normal earth or ground with vegetation that are absorptive to sound energy, thereby providing ground-effect attenuation.

sound exposure level (SEL) — A common unit of sound energy used in airborne acoustics to describe short-duration events. The time integral of frequency-weighted squared instantaneous sound pressures. It is proportionally equivalent to the time integral of the pressure squared and can be described in terms of μ Pa² sec over the duration of the impulse. (Source: Fisheries and Hydroacoustic Monitoring Program Compliance Report, San Francisco-Oakland Bay Bridge East Span Seismic Safety Project 6-11.)

sound flanking — Noise that reaches an observer by paths around or over an acoustical barrier such as a bubble curtain.

sound intensity — The rate at which sound energy flows through a unit area.

sound pressure level (SPL) — Sound pressure is the sound force per unit area, usually expressed in micro pascals (or 20 micro newtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressure exerted by the sound to a reference sound pressure (e.g., 20 micro pascals). $SPL = 20 \log \left\{ \frac{\partial P}{\mu 1 1} \right\}$. Sound pressure level is the quantity that is directly measured by a sound level meter.

source (noise) — A general term designating the prime sound energy generator.

species — Includes any subspecies of fish, wildlife, or plant, or any distinct population segment of any species of vertebrate fish or wildlife, which interbreeds when mature.

species of concern — A species, usually thought to be in decline, that may be considered for federal candidate status in the future.

spherical spreading — Spreading of sound pressure in a dome or sphere shape from the source.

suitable habitat — The area where an organism, including a plant, animal or fish, naturally or normally lives and grows.

swale — A natural depression or shallow drainage conveyance with relatively gentle side slopes, generally less than 1 foot, used to temporarily store, route, or filter runoff.

swimbladder — See *gas bladder*.

take (taking) — To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (as defined under the Endangered Species Act 16 U.S.C. 1532(19)). USFWS and NMFS have expanded their definitions of harm (see definition for harm above).

threatened species — Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

threshold discharge area — An on-site area draining to a single natural discharge location or multiple natural discharge locations that combine within 1/4-mile downstream (as determined by the shortest flow path).

time expended — A field operation term indicating the time to bring up a cage, unload the fish, put a new group in, and drop the cage back to depth.

total acoustic energy (dB re 1 μ Pa² sec) — Proportionally equivalent to the time integral of the pressure squared, described here in terms of μ Pa² sec over the duration of the impulse. Similar to the unweighted sound exposure level (SEL) standardized in airborne acoustics to study noise from single events.

transducer — A device used to convert underwater sound into electrical voltage.

transect — A marked or measured line or strip at a project site along which environmental samples are collected.

transmission loss — The accumulated decrease in acoustic intensity as the acoustic pressure wave propagates outward from the source due to spreading.

trench — A long cut in the ground, i.e., a ditch or swale.

trend line — In technical analysis, a line or two parallel lines that indicate the direction in which a measurable effect is moving, and the direction in which it will continue to move.

underpressure — Negative pressure spike below ambient levels.

unoccupied critical habitat — Critical habitat that is not occupied (i.e., not permanently or seasonally occupied) by the listed species at the time of the project analysis. The habitat may be suitable, but the species has been extirpated from this portion of its range. Conversely, critical habitat may have been designated in areas unsuitable for the species, but restorable to suitability with proper management, if the area is necessary to either stabilize the population or assure eventual recovery of a listed species. As recovery proceeds, this formerly unoccupied habitat may become occupied. Some designated, unoccupied habitat may never be occupied by the species, but was designated since it is essential for conserving the species because it maintains factors constituting the species' habitat. For example, critical habitat may be designated for an upstream area maintaining the hydrology of the species' habitat downstream.

utricle — One of three paired structures in the inner ear of fishes associated with the bony otolith. In most species the utricle is involved in sound detection.

vault — An underground storage facility that collects runoff and either percolates that runoff into the surrounding soil at various rates or permanently pools the runoff.

waveforms (μPa over time) — A graphical plot illustrating the time history of positive and negative sound pressure of individual pile strikes shown as a plot of μPa over time (i.e., seconds).

wavelength — The distance between successive peaks or nodes of a wave.

wet pond — A facility that contains a permanent pool of water and removes pollutants from highway runoff through sedimentation, biological uptake, and plant filtration.

wet vault — An underground storage facility that permanently pools water and acts as a settling basin for fine sediment bound with pollutants.

22.2 Abbreviations

ABC	air bubble curtain
AKART	all known, available, and reasonable methods of prevention, control, and treatment
BA	biological assessment
BE	biological evaluation
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
BO	biological opinion
CCA	chromated copper arsenate
CE	categorical exclusion
CFR	Code of Federal Regulations
CM	conservation measure
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
dBA	A-weighted decibel
dbh	diameter at breast height (of a tree)
DPS	distinct population segment
EA	environmental assessment
ECA	equivalent clear-cut area
Ecology	Washington Department of Ecology
ECS	environmental classification summary
EFH	essential fish habitat
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FEMAT	Forest Ecosystem Management Assessment Team Report (same as NFP)

FHWA	Federal Highway Administration
FMP	fishery management plan
FONSI	finding of no significant impact
FR	Federal Register
GMA	Washington Growth Management Act
HCP	habitat conservation plan
HLP	Highways and Local Programs, WSDOT
HOV	high-occupancy vehicle
HPA	hydraulic project approval
HRM	WSDOT <i>Highway Runoff Manual</i>
HRM/ESA checklist	<i>Highway Runoff Manual</i> /Endangered Species Act checklist
HUC	hydrologic unit code
Hz	hertz
IL	(WSDOT) Instructional Letter
ITS	intelligent transportation systems
kJ	kilojoule
LTAA	likely to adversely affect
LSOG	late-stage old growth
LWD	large woody debris
μPa	micro pascal
MLLW	mean lower low water
MM	minimization measure
MMPA	Marine Mammal Protection Act
MP	milepost
msec	millisecond
NE	no effect
NEPA	National Environmental Policy Act
NFP	Northwest Forest Plan (same as FEMAT)
NIS	new impervious surface
NLTAA	not likely to adversely affect

NMFS	National Marine Fisheries Service (now NOAA Fisheries)
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service (same as NMFS)
NPDES	National Pollutant Discharge Elimination System
OHWM	ordinary high water mark
Pa	pascal
PBA	programmatic biological assessment
PBE	programmatic biological evaluation
PCE	primary constituent element
PFMC	Pacific Fishery Management Council
PHS	priority habitats and species
PM	performance measure
psi	pounds per square inch
RM	river mile
RMS	root mean square
ROD	record of decision
RPA	reasonable and prudent alternative
RPM	reasonable and prudent measure
SEPA	Washington State Environmental Policy Act
SEL	sound exposure level
SPL	sound pressure level
SSP	stormwater site plan
T&E	threatened and endangered species (may also imply any status down to and including species of concern)
TESC	temporary erosion and sedimentation control
TL	transmission loss (sound)
TMDL	total maximum daily load
TSS	total suspended solids
UIC	underground injection control
USC	United States Code
U.S. COE	U.S. Army Corps of Engineers

USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WCC	Washington Conservation Commission
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WRIA	water resource inventory area
WSDOT	Washington State Department of Transportation