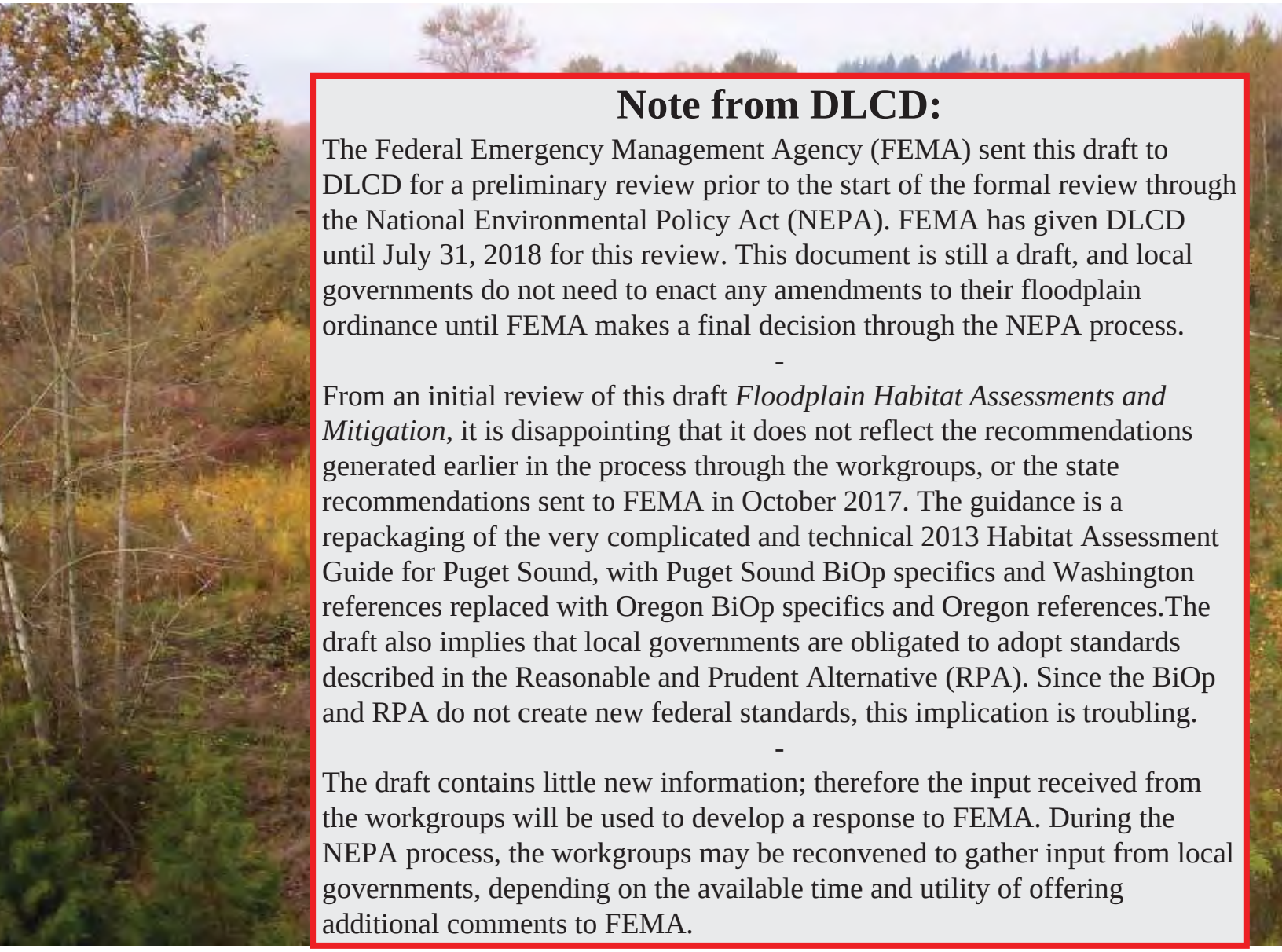

Note from DLCD:

The Federal Emergency Management Agency (FEMA) sent this draft to DLCD for a preliminary review prior to the start of the formal review through the National Environmental Policy Act (NEPA). FEMA has given DLCD until July 31, 2018 for this review. This document is still a draft, and local governments do not need to enact any amendments to their floodplain ordinance until FEMA makes a final decision through the NEPA process.

-

From an initial review of this draft *Floodplain Habitat Assessments and Mitigation*, it is disappointing that it does not reflect the recommendations generated earlier in the process through the workgroups, or the state recommendations sent to FEMA in October 2017. The guidance is a repackaging of the very complicated and technical 2013 Habitat Assessment Guide for Puget Sound, with Puget Sound BiOp specifics and Washington references replaced with Oregon BiOp specifics and Oregon references.The draft also implies that local governments are obligated to adopt standards described in the Reasonable and Prudent Alternative (RPA). Since the BiOp and RPA do not create new federal standards, this implication is troubling.

-

The draft contains little new information; therefore the input received from the workgroups will be used to develop a response to FEMA. During the NEPA process, the workgroups may be reconvened to gather input from local governments, depending on the available time and utility of offering additional comments to FEMA.

Floodplain Habitat Assessment and Mitigation

Regional Guidance for Oregon

Draft Update 2018

FEMA Region 10

DRAFT Implementation Plan, Appendix C

Regional Guidance

For

Floodplain Habitat Assessments and Mitigation in Oregon

Produced by FEMA - Region 10
Draft Update 2018

FEMA
Region 10

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This guidance document was developed by Region10 of the Federal Emergency Management Agency, as part of its continuing effort to improve floodplain management practices and assist communities in meeting the requirements of the Endangered Species Act.

An earlier version of this document that was written for Puget Sound was drafted in 2010 by French & Associates, Ltd., Steilacoom, ESA Adolfson, Seattle, and PBS&J, Seattle, through an arrangement with the Insurance Services Office and the Community Rating System. Extensive edits were completed by FEMA Region 10 in 2013 in a document that was written solely for Puget Sound with contribution from National Marine Fisheries Service.

The 2018 Update was prepared by CDM Smith and FEMA Region 10 and is intended for use by Oregon communities.

Acronyms

BA	Biological Assessment
BE	Biological Evaluation
BO	Biological Opinion
CMZ	Channel Migration Zone
DLCD	Oregon Department of Land Conservation
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FWHCA	Fish and Wildlife Habitat Conservation Areas
HA	Habitat Assessment
HPA	Hydraulic Project Approval
IPaC	Information for Planning and Consultation tool
JARPA	Joint Aquatic Resources Permit Application
JPA	Joint Permit Application
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
ODEQ	Oregon Department of Environmental Quality
ODSL	Oregon Department of State Lands
RBZ	Riparian buffer zone
RPA	Reasonable and Prudent Alternative
SFHA	Special Flood Hazard Area
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife

1.0 Introduction

1.1 Background

This Regional Guidance is written to assist communities in meeting the requirements and criteria of the Endangered Species Act (ESA) in regards to the National Flood Insurance Program (NFIP). Those requirements are described in Biological Opinions (BO) issued by the National Marine Fisheries Service (NMFS) on April 14, 2016 for most of the State of Oregon.

This guide is a companion to the BO for Oregon and the ESA Consultation Handbook (NMFS and USFWS 1998). It is intended to assist environmental planners, fisheries biologists, and other qualified floodplain and river management professionals who may potentially write or review habitat assessments (HAs). This document focuses on requirements specific to Oregon, but it may also be useful in other areas of the country. It provides information on methods that communities may utilize to assess the impacts of land management actions on ESA-listed species and their designated critical habitats within the 100-year floodplain.

This document is also designed to support the NFIP-ESA Model Ordinances prepared by the Federal Emergency Management Agency (FEMA) Region 10 and offered as one option to comply with the respective NMFS BO for Oregon. The Model Ordinance include a BO Checklist, which provides a summary of what is required of communities to abide by the ESA under the NFIP.

For further details on each BO's requirements, see the BO and RPA for Oregon. Model Ordinance and additional guidance documents for Oregon are also available from FEMA Region X

Communities in Oregon have the option (Option 1) of adopting the Model Ordinances, ensuring that their existing regulations fulfill all the requirements of the 2016 BO under a hybrid programmatic habitat assessment approach, or via a permit-by- permit approach. Sections of the Model Ordinance are referenced in this guidance to help the reader match the requirements of the BO with NFIP regulations. Additional references included in this guidebook are listed at the end of the document.

The Oregon BO allows for compensatory mitigation of adverse effects anywhere within the 100-year floodplain. This is a significant difference from other BOs in other areas of the Pacific Northwest.

This guidance document will assist jurisdictions to assess and document ESA compliance reviews for permits issued for projects, and should be useful to those jurisdictions who are complying with the requirements of the BOs through adoption of a model ordinance or documentation of existing regulations.

One of the options under the Oregon Option 2 approach is conduct a full 'programmatic' habitat assessment of all the conditions, regulations, and reasonably foreseeable future land actions across an entire analysis area. (Reasonably foreseeable is the timeframe over which predictions about future conditions and the effect determinations on species can be reasonably relied upon.) The content and format of these full programmatic habitat assessments may differ due to variations in: existing regulations; current baseline habitat conditions; and the relative potential for negative impacts on ESA-listed species and their designated critical habitats due to possible future land development actions.

Another option under Oregon Option 2 approach is for a jurisdiction to describe - and cite (via links) which of their current regulations comply with which specific terms and conditions in the RPA of the relevant BO. In this case the jurisdiction may need to explain and justify why a regulation meets some of the specific requirements within the RPA, since in some cases the compliance may not be immediately obvious due to varying language and intent. The applicant will essentially have to demonstrate why their existing regulations meet some or all of the terms and conditions, and what changes they will make to incorporate terms and conditions not found in their current regulations. In all cases, regardless of which compliance option is selected, the objective is to avoid adverse effects to ESA-listed species and their designated critical habitats by protecting the natural functions and processes and habitats that support ESA-listed species and their designated critical habitats.

This guidance was prepared with technical input from local officials, engineers, natural resources scientists, and planners. It is designed to assist qualified habitat professionals, representing both permit applicants and permit officials, to ensure that new development within the Special Flood Hazard Area will not adversely affect the populations or habitats of species listed under the ESA as threatened or endangered. This guidance is focused on ESA-listed species utilized habitats in flood- prone areas, including those areas associated with stream, lake, and marine waters.

The 2016 BO relating to the implementation of the NFIP in Oregon applies to fish species and marine mammals that are listed as threatened or endangered that are administered by the NMFS. However, the Model Ordinances and this guidance may also help guide assessment of potential impacts of project actions on bull trout (administered by the U.S. Fish and Wildlife Service [USFWS]), which are currently listed as threatened or endangered. Bull trout are widely distributed in the upper reaches of many watersheds in the Pacific Northwest. The assessment of impacts on other fish species that become candidates for ESA-listing, or proposed to be listed, may also be warranted to assure that project proposals adequately address their needs in the event that they become formally listed while a project is still underway. This assessment guidance does not, however, provide details on possible methods of assessing impacts to any ESA-listed wildlife, invertebrate, or plant species that may be present, or impacts to their habitats.

1.2 Definitions

Three terms are used in this guidance and the Model Ordinances for Oregon that may not be the same terms used in a community's regulations: "Special Flood Hazard Area" (SFHA); "Regulatory Floodway, and "development." These terms are introduced in the Definitions section of the Model Ordinances (Section 2), and the first three are also defined in more detail in Sections 3.1, 3.2 and 3.4 of the Model Ordinances.

The **SFHA** is the area subject to flooding by the base flood (as determined and mapped for each community by FEMA within flood insurance studies and accompanying Flood Insurance Rate Maps [FIRMs]).

The **regulatory floodway** is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

"**Development**" is "any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials." The Washington and Oregon BOs extend that definition to include subdivision of land, removal of vegetation, other alteration of natural site characteristics (including any remnant natural characteristics existing in a degraded site), substantial repairs and improvements, and the maintenance, repair, or remodel of existing buildings, facilities, and utilities when their existing footprint is expanded.

1.3 When to Conduct a Habitat Assessment

Whenever a development project is proposed in the 100-year floodplain the property owner must obtain a floodplain development permit from the community. Certain types of projects can be permitted relatively quickly (see "Allowed Activities" below). Unless a community's floodplain management ordinance lists a project action type as exempt from the requirement to complete an HA (see Section 1.3.1), the project applicant must complete an HA that describes the impact of the proposed development on existing floodplain and instream habitat functions and processes. The scope and detail of that assessment may vary as needed to portray possible impacts for each project. If the anticipated project effects are clearly limited in nature and extent, it may be possible to describe them in a relatively short assessment. The greater the complexity, scope, and/or risk of possible impacts to ESA-listed species or their habitats, the more likely it will be that the HA will need to be an in-depth analysis to portray impacts and describe planned mitigation if needed.

1.3.1 No Habitat Assessment Required

There are four general circumstances where an HA would not be required:

1. Projects that are listed as exempt from conducting a habitat assessment in the BO for Oregon (exempt situations are listed below).
2. Project actions that are covered under separate consultations under Section 4(d), 7, or 10 of the ESA.
3. When the project under consideration has already been covered by a full programmatic habitat assessment (Option 2) of all current and reasonably foreseeable future conditions throughout a jurisdiction. When such an assessment already exists, and the project clearly fits within the nature and scope of those project types that were addressed by it, then the jurisdiction need only document and track how they evaluated that it was covered by that assessment.
4. If a jurisdiction adopts all the requirements within the NMFS BOs for Oregon into their local ordinances (Option 1), and requires compliance of all conditions on every land parcel within the FEMA regulatory floodplain, HAs for individual projects would not be required to be completed.

1.3.1.1 No HA Required and No Floodplain Permit Required:

Communities may allow the following activities in the floodplain without requiring a floodplain development permit, provided all applicable federal, state, and local requirements are met. A floodplain permit is not required because these activities do not meet the NFIP definition of "development." Note: local community regulations may be more restrictive than the minimum standards (44 CFR 59).

- Routine maintenance of existing landscaping that does not involve grading, excavation, or filling.

- Removal of noxious weeds, hazard trees, and replacement of non-native vegetation with native vegetation.
- Normal maintenance of above ground utilities and facilities, such as replacing power lines and utility poles.
- Normal road maintenance, such as filling potholes, repaving, installing signs and traffic signals, but not including any expansion.
- Normal maintenance of a levee or other flood control facility as prescribed in the operations and maintenance plan for the facility. Normal maintenance does not include repair from flood damage, any expansion of the prism, face or toe expansion, or the addition of material for protection or armor.
- Plowing and other normal farm practices (other than new structures or filling) on legally existing agricultural areas. Clearing additional land for agriculture will likely require a floodplain development permit and an HA.

1.3.1.2 Floodplain Permit Required and No HA Required

Communities may allow the following activities in the floodplain without an HA, provided a floodplain development permit is obtained, and all applicable federal, state, and local requirements are met.

- Normal maintenance, repairs, or remodeling of structures, such as re-roofing and replacing siding, provided such work is not a substantial improvement or a repair of substantial damage. To comply, such work must be less than 50 percent of the value of the structure(s).
- Expansion or reconstruction of an existing structure that is no greater than 10 percent beyond its existing footprint. If the structure is in the floodway, there shall be no change in the structure's dimensions perpendicular to flow. All other federal and state requirements and restrictions relating to floodway development still apply.
- Activities with the sole purpose of creating, restoring or enhancing natural functions associated with floodplains, streams, lakes, estuaries, marine areas, habitat, and riparian areas that meet federal and state standards, provided the activities do not include structures, grading, fill, or impervious surfaces.
- Development of open space and recreational facilities, such as parks, trails, and hunting grounds, that do not include structures, fill, impervious surfaces or removal of more than 5 percent of the native vegetation on that portion of the property in the floodplain.
- Repair to onsite septic systems, provided ground disturbance is the minimal necessary and best management practices (BMP's) to prevent stormwater runoff and soil erosion are used.
- Projects that have already received concurrence under another permit or other consultation with the Services, either through Section 7, Section 4d, or Section 10 of the ESA that addresses the entirety of the project in the floodplain (such as a U.S. Army

Corps of Engineers (USACE) 404 permit or non-conversion Forest Practice activities including any interrelated and interdependent activities.).

- Repair of an existing, functional bulkhead in the same location and footprint with the same materials when the Ordinary High Water Mark (OHWM) is still outside of the face of the bulkhead.

Projects that require a federal permit under Section 404 of the Clean Water Act would likely need to go through an ESA consultation process led by the USACE Regulatory Branch. The Section 404 permit process includes consultation with the U.S. Fish and Wildlife Service (USFWS), and/or NMFS when a project may have an effect on a federally listed species. Such consultation is required under Section 7 of the ESA. If a project has gone through this Section 7 process with USACE, then a local HA would not be required.

If a permit applicant has prepared a Biological Evaluation (BE) or a Biological Assessment (BA) and has received concurrence from USFWS and/or NMFS as applicable for the species potentially present (via either a Letter of Concurrence or a BO) that covers the full scope of the proposed action, the project is deemed to comply with the ESA. In such cases the additional HA requirements of this guidance are not required (see Section 7.7 of either of the Model Ordinances).

1.4 Habitat Assessment Overview

The habitat assessment needs to describe any impacts to habitat functions due to actions occurring both within the Special Flood Hazard Area. The assessment must demonstrate that there will be no short- or long-term adverse effects due to actions or that such effects have been fully mitigated.

The impact of a project on habitat functions and processes may be complicated to determine because there is often little or no information on the site's baseline (pre-project) natural features. A habitat assessment is needed to identify those natural functions and to complete an analysis that estimates what effects the proposed action will have upon ESA-listed species and their critical habitats (Section 7.7 in either Model Ordinance).

If the assessment finds that an adverse effect may occur due to impacts from the proposed action on ESA-listed fish species, killer whales, or their designated critical habitats, then the permit applicant must prepare a plan that identifies the steps that the applicant will take to modify the proposed action to avoid or fully mitigate adverse effects. Jurisdictions must be able to document the details of the mitigation plan and identify what the required mitigation measures are. They must also be able to monitor and document (track) the implementation and effectiveness of the plan, any enforcement actions taken, and provide that information to FEMA if requested.

Within the Special Flood Hazard Area, any actions that would adversely affect ESA-listed species or their critical habitats must be fully mitigated. In the required descending order of preference, the mitigation sequence is avoidance, minimization, replacement, and/or in-kind or out-of-kind

compensatory mitigation. Applicants must explain and document why all preferable forms of mitigation were not practicable before proposing less preferable forms (e.g. off-site actions that are also out-of-kind). They must also be able to monitor and document (track) the implementation and effectiveness of the plan, any enforcement actions taken, and provide that information to FEMA if requested.

1.5 Preparing and Reviewing a Habitat Assessment

This guidance provides a step-by-step approach to complete an HA, when an assessment is needed. The approach described in the following sections should provide sufficient information to assess and document the likely effects of a proposed project, but it does not have to be followed exactly as described. However, if a different approach is followed, it must provide sufficient data and analysis to describe baseline conditions and likely effects on ESA-listed species and their designated critical habitat, and conclude with an effects determination that is well supported by that analysis. The process recommended in this guidance is summarized in the flow chart in **Figure 1-2**. Steps 1 through 4 comprise the basic HA for a project. See Section 1.3.1.1 and 1.3.1.2 for a list of allowed activities in which a habitat assessment is not required.

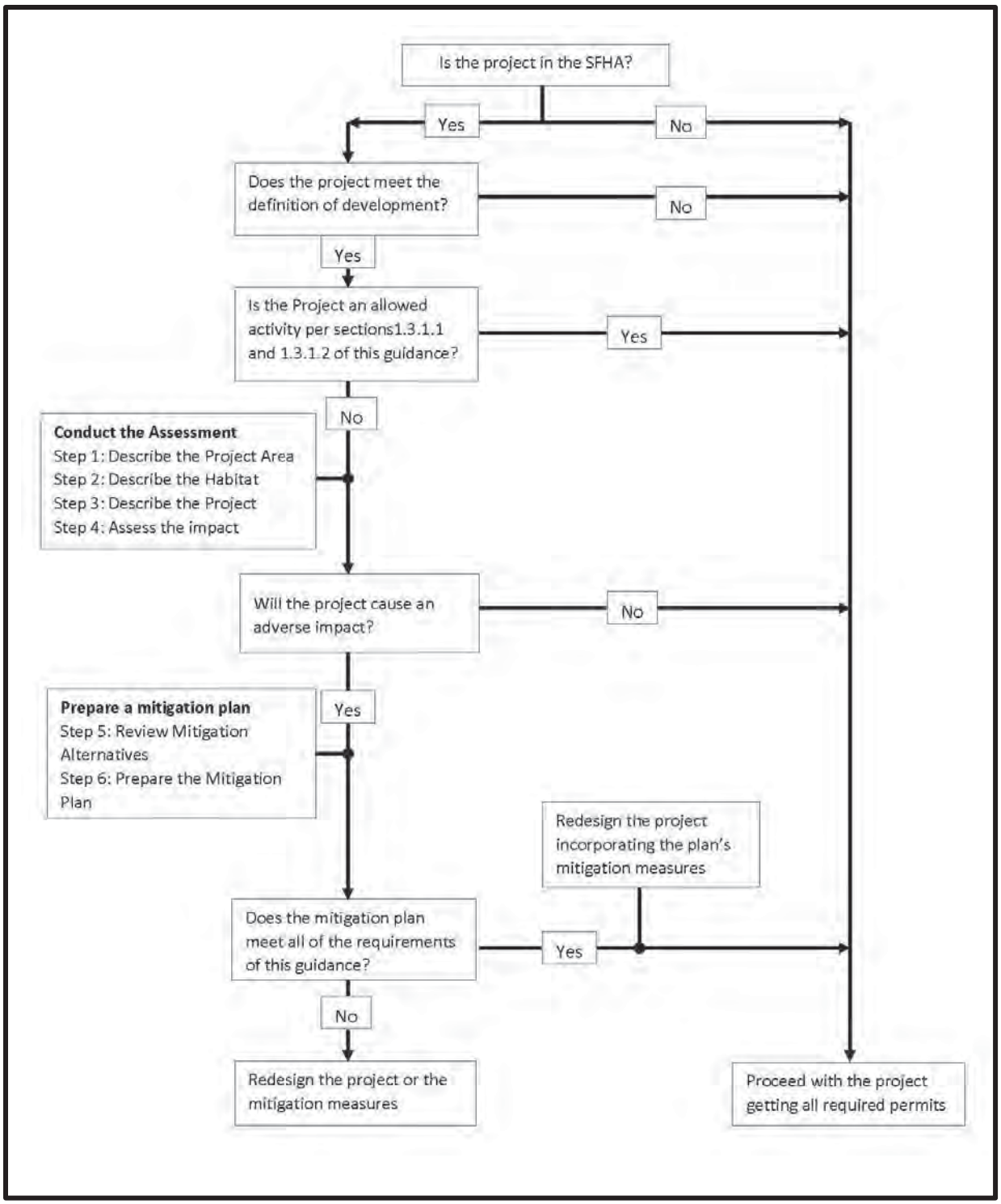

Figure 1-2. Habitat Assessment Process Flow Chart

This guidebook is not intended to represent comprehensive instructions for how a jurisdiction should complete a comprehensive "programmatic" HA of existing conditions and impacts of community's regulations across its entire jurisdiction (e.g. conditions within all of the watersheds in a jurisdiction), but it helps describe the information that would be needed to complete such an extensive and inclusive programmatic assessment. Some communities may conduct such programmatic assessments with differing approaches based on their land uses and regulatory structure, data and GIS-coverage available, and community goals. Communities may request technical assistance from FEMA when they draft programmatic habitat assessments, or review those prepared by others for projects within their jurisdictions.

The guidance is also not intended to provide complete instructions on how to document and justify how a jurisdiction's existing regulations, and any planned changes to those regulations, comply with all the terms and conditions within the RPAs of the pertinent BO. This guidance is primarily intended to assist applicants under the permit-by-permit approach ("Option" 3) to prepare a Habitat Assessment. Applicants may also seek assistance from their local jurisdiction for preparation of the Habitat Assessment. If the project is complex, it's recommended that the applicant begin with conceptual development plans and conduct a preliminary Habitat Assessment before they invest in detailed project plans and specifications. Continued communication with community staff will also help identify problems and solutions before significant time and/or money is spent on a project that may require additional mitigation measures, or need to be redesigned or abandoned. Communities with limited staff may want to consider requesting assistance from their neighboring jurisdictions, tribes, or other partners to help assess the adequacy of draft Habitat Assessments written on their behalf. This guidance document allows for flexibility in the format of many aspects of the assessment. Reviewers of draft assessments should be familiar with the range of formats that adequately portray and interpret fisheries population and habitat survey data.

A permit applicant should weigh the cost of preparing an assessment and mitigation plan, should one be needed, against the cost of locating the project outside the SFHA. It may cost less in time and money to simply avoid the SFHA.

2.0 Conducting the Assessment

The process to adequately identify and address the impacts a proposed project may have on habitat within the floodplain is described in the following sections. The first few steps are to describe the project area, area of potential effects (which may be larger), and whether any listed species potentially occur in that area. If ESA -listed species potentially occur within the area where project effects may occur, then the potential impacts on those species would be determined. When habitat impacts are identified, a mitigation plan must be prepared for the project, in accordance with Steps 5 and 6. In circumstances where an approved habitat assessment (Steps 1 through 4) determines that no impacts on habitat functions associated with ESA-listed species will occur, development of a mitigation plan is not necessary. However, most activities within the

SFHA (100-year floodplain) that require a HA are highly likely to have impacts on habitats associated with ESA-listed species.

2.1 Step 1. Describe the Project Area

In Step 1 of the habitat assessment, the applicant describes the project area and provides a map of that area. The project area is generally the parcel or parcels being developed. In some cases, the project may extend to a larger area, such as when a road to the parcel is to be built or improved, or when the effects of several interrelated or interdependent proposed land development actions are considered together. Under Step 1, two documents would be produced– the project area description and a project area map.

2.1.1 Project Area Description

If an Oregon State Joint Permit Application (JPA) form has been prepared for the project, it will include the general project area description information that would be included as part of the habitat assessment. JPAs are completed when a 404 permit is needed from USACE for excavation or filling of waters of the U.S. , a 401 approval is required from the Oregon Department of Environmental Quality (ODEQ), and/or a removal-fill permit is required from the Oregon Department of State Lands (DSL). However, the JARPA and JPA may not adequately describe all the natural functions and processes that support habitat, species distribution, hydrologic variables, and/or water quality that need to be addressed in a habitat assessment. At a minimum, Oregon State JPA forms would include the following information:

- **Location information:**
  - Street address
  - City and County
  - Township, section, and range
  - Latitude and longitude
  - Tax parcel number(s) of the project location
  - Type of ownership of the project (Federal, State, or locally owned public lands; tribal lands; privately owned lands)
- **Water resource information:**
  - Watershed name
    Water resource inventory area (WRIA) or HUC codes. HUC codes for the Pacific Northwest region can be found at the U.S. Geological Survey site: https://water.usgs.gov/GIS/wbd_huc8.pdf.
  - Names and descriptions of the water bodies in which work will occur, including water type. For more information on water type and a map that designates the types for

major water bodies, see the Oregon State Water Resources Department water typing page (http://www.oregon.gov/ODF/Documents/WorkingForests/WaterClassificationTechNote1.pdf)

  - Water bodies bordering or adjacent to the project location, including water type.
  - . Coastal Management Areas are associated with the coasts of Oregon, as managed by the Oregon Coastal Zone Management Program.
  - Critical Areas associated with streams, designated by the local jurisdiction or state.

- **Fish and Wildlife Habitat Areas**
  - Oregon: Designated Goal 5 resources including riparian areas, wetlands, wildlife habitat, and natural areas in or near the project area.

2.1.2 Project Area Map

The second item needed for Step 1 is a map, drawn to scale that shows the following:

- Parcel(s) boundaries
- Full analysis area
- Area of the finished project (including roads)
- Any additional area(s) that will be disrupted during construction (including access routes, staging areas, and areas to be re-graded or filled)
- All water bodies
- Site topography, soils, and geology
- Fish and Wildlife Habitat Conservation Areas/ Goal 5 resources
- Existing native vegetation by vegetation community zones. For example, a map could distinguish areas with existing coniferous forest cover from areas with shrub cover and areas with grass cover.
- Boundaries of the following regulatory areas (see Section 3 of the Model Ordinance)
  - Special Flood Hazard Area
  - Floodway (if available)
  - Riparian buffer zone (RBZ)
  - Channel Migration Zone (CMZ) (where available)
- Depths of the 10- and 100-year floods at representative locations. These only need to be provided when flood data is available from existing studies for the community.

If there is no CMZ, communities can either designate the entire SFHA as the CMZ or identify the channel migration area in accordance with *Regional Guidance for Hydrologic and Hydraulic Studies* (FEMA 2010).

2.2 Step 2. Describe the Project Area's Habitat

In Step 2 of the habitat assessment, the applicant describes the existing habitat conditions of the project area. Tasks 2.2.1 and 2.2.2 of Step 2 are largely based on existing scientific information on species use and current habitat functions in the project area.

2.2.1 Background Research

Step 2 starts with a review of existing sources of information relevant to threatened or endangered species and their habitats in or near the project area in order to adequately describe current population and habitat conditions. There may be thorough inventories already available. The following sources should be checked, and appropriate sections referenced as needed:

- The community's planning or environmental protection department for critical areas inventory maps, best available science consistency studies, flood control and floodplain management plans, watershed analyses, and habitat studies
    - For Oregon, the following sources may be helpful: Conservation Strategy Areas; Coastal Zone Management Program
- The community's parks and/or natural resources departments natural area studies
- NMFS distribution of threatened and endangered Species (www.nwr.noaa.gov)
- NMFS designated critical habitat maps (www.nmfs.noaa.gov/pr/species/criticalhabitat.htm)
- USFWS Information for Planning and Consultation tool (IPaC) at https://ecos.fws.gov/ipac/location/index
- USFWS critical habitat maps (http://criticalhabitat.fws.gov/ and (www.fws.gov/pacific/bulltrout/)
- USFWS National Wetland Inventory mapper (https://www.fws.gov/wetlands/data/Mapper.html)
- USFWS and NMFS habitat recovery plans, when published for ESA listed species in the project vicinity
    - USFWS: (www.fws.gov/pacific)
    - NMFS: (www.nwr.noaa.gov)
- U.S. Department of Agriculture, Natural Resource Conservation Service soil survey maps (http://websoilsurvey.nrcs.usda.gov/app/)

- Oregon Department of Fish and Wildlife threatened and endangered species list (http://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_candidate_list.asp)
- Oregon Department of Fish and Wildlife Crucial Habitat Database (http://dfw.state.or.us/maps/compass/data.asp)
- Oregon State Department of Environmental Quality Water Quality Assessment (http://www.oregon.gov/deq/wq/Pages/WQ-Assessment.aspx)
- Stream surveys conducted by tribes or federal, state, or local agencies. Such surveys may contain detailed information on habitat conditions and fish species presence from redd surveys, or snorkeling or electroshocking surveys. Other recent projects near the project area may also have collected stream survey or other habitat data.

2.2.2 Protected Species Identification

The review of the existing research should identify all federally-listed species and designated critical habitats, Essential Fish Habitat (EFH) as defined by the Magnuson-Stevens Fishery Conservation and Management Act, affected EFH species, and Fish and Wildlife Habitat Conservation Areas or Conservation Strategy Areas that occur in or near the project area. Species or habitats that have the potential to be directly, indirectly, or cumulatively negatively impacted by proposed ground-disturbing actions need to be described. The appropriate spatial and temporal scales for each form of potential impact must also be identified and briefly explained. Further discussion of potentially measurable or observable impacts, and the appropriate spatial and temporal scales for an effects analysis is presented later in this guidebook.

The table below is an example of how species presence and ESA status of populations and Critical Habitat could be presented. Additional columns could also be inserted to list the status of EFH and other categories when present and convenient to describe in a tabular format.

Table 2-1. Sample Species Status Table for a Habitat Assessment

Occurrence of Listed Species and Critical Habitat in or Near the Project Area.				
Common Name	Scientific Name	ESA Status	Jurisdiction	Critical Habitat
Puget Sound Evolutionarily Significant Unit (ESU) Chinook Salmon	*Oncorhynchus tshawytscha*	Threatened	NMFS	Yes
Puget Sound Distinct Population Segment (DPS) Steelhead	*O. mykiss*	Threatened	NMFS	Yes
Coastal-Puget Sound DPS Bull Trout	*Salvelinus confluentus*	Threatened	USFWS	Yes
Southern Resident DPS of Killer Whale	*Orcinus orca*	Endangered	NMFS	Yes

To obtain general maps of the distribution of ESA-listed or proposed species, listed critical habitats, and any areas designated Essential Fish Habitat check with the NMFS and USFWS data sources described in Section 2.1 of this document. Please note that the maps of potential fish distribution at these websites are not necessarily the most detailed or accurate maps that exist. The regional or local offices of NMFS, USFWS, WDFW, tribes, or local land management agencies may be able to provide more accurate maps based on recent fish and habitat surveys, including known migration barriers.

EFH species are managed by NMFS. On the west coast of the United States there are three EFH salmon species that potentially occur in freshwater systems, namely pink, coho, and Chinook salmon. If project actions may potentially negatively impact estuarine and marine systems, numerous species of ground fish and coastal pelagic fishes may also need to be considered that are listed under EFH.

This task should summarize the biological and ecological information that will be needed for the habitat assessment. Appropriate information on specie(s) life histories, their habitat and distributions, and other data on habitat life cycle variables necessary for their survival or possible recovery in the future must be included in order to provide sufficient background for the analyses in later sections. It is important to note that even though the 2016 BO for Oregon focuses on salmon and EFH species managed by NMFS, all threatened or endangered plant and animal species in or near the project area need to be addressed. If other ESA-listed species are present or are potentially present, it may be necessary to conduct additional surveys and assessments beyond those described in this guidance.

Several sources of existing information are listed above in Section 2.2.1. When a document contains relevant information, that information can simply be cited by page-specific reference. Other sources include the locally developed Best Available Science (BAS) documentation reports, which are required to be prepared by each community for their critical areas standards under the state's Growth Management Act. Addition references are provided below as examples of the general format and guidance on how some agencies conduct biological assessments.

- The U.S. Army Corps of Engineers' ESA *Consultation Initiation Template* (USACE 2007) [http://www.spk.usace.army.mil/Portals/12/documents/regulatory/pdf/ESA_Template_Guidance. pdf]

- *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996). [http://www.nwr.noaa.gov/Publications/Reference-Documents/upload/matrix_1996.pdf]

- Oregon Department of Transportation *Biological Assessment and Guidance Document* (ODOT 2005). [http://cms.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/docs/BAWritingDocument.pdf]

The Pacific Northwest Region of NMFS currently does not formally recommend use of any specific template for Biological Assessments (other than the 'Analytical Process' for some specific land management actions like timber sales on Federal lands), but rather allows the potential use of a variety of formats.

HAs must describe existing habitat and species population conditions for each ESA-listed species that may occur in the area of potential effect. The HA should describe the habitat functions that potentially support ESA-listed species in or near the action area. It must then describe the potential impacts of the proposed actions on individuals of each species, populations of those species, and their habitats. The detail and extent of each assessment will vary by the nature and scope of the proposal and the potential for negative impacts.

This section's narrative should include, but not necessarily be limited to descriptions and discussions of the following topics:

i. Factors of decline
   a. Historical pressures on the species
   b. Current pressures on the species
   c. Limiting factors for recovery of the species
ii. Local empirical information (if available)
   a. Current local population information
   b. Ongoing monitoring programs (if any)
   c. Population trend of the species

Following the description of each protected species, there should be a summary of the habitat needs for that species. This section of the narrative needs to identify and describe the key factors that are important to the protected species, which would include the Primary Constituent Elements (PCEs) for those species with designated critical habitat. PCEs are the key habitat components that an ESA listed species needs to survive in an area (see example in the box). PCEs are described in the Federal Register publication for the designated critical habitat for each species. The PCEs must be described when critical habitat may potentially be affected. In those cases where designated critical habitat is not present near the project action area, describing the available habitat in terms of the PCE components is still recommended in order to concisely describe existing habitat features. Not all of the PCEs for a species may apply to a project. In the example in the box, if the project area is on a freshwater stream, then PCEs related to the ocean environment would not apply to the project.

Example Primary Constituent Elements

(Chinook salmon and steelhead trout, 50 CFR Part 226, Federal Register / Vol. 70, No. 170 / Friday, September 2, 2005)

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.
2. Freshwater rearing sites with water quantity and floodplain connectivity
3. Freshwater migration corridors free of obstruction
4. Estuarine areas free of obstruction
5. Nearshore marine areas free of obstruction
6. Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

2.2.3 Site Investigation

Tasks 2.2.1 and 2.2.2 give the applicant guidance on where to look and what to look for regarding species potentially present at the site. Following completion of the first parts of Step 2, a site visit is usually needed to determine if there are habitat areas in the project area with which identified species have a "primary association." "Habitats of primary association" include critical habitat components (which could be PCEs) that, if altered, may reduce the likelihood that the listed species will be able to continue to live and reproduce in the area over the long term. A site visit and determination of site-specific conditions is generally necessary to determine what actual impacts on ESA-listed species, EFH, and associated habitats may occur from a proposed project.

For example, identification of Chinook salmon habitat areas of primary association should look for those PCEs listed in the box. A description of the riparian and instream habitat conditions that exist in both upstream and downstream of the project action area would also be needed.

This description of existing baseline habitat functions must, at a minimum, include those habitat functions that are listed in the BOs on the NFIP in Oregon. These functions are described in the next section on the habitat narrative. In addition, it is especially important to note the locations and distances from the proposed project area relative to any stream reaches that may potentially support ESA-listed species or contain designated critical habitat.

The description of habitat and general conditions in the project area should also identify existing modifications to the project site within the floodplain, including existing structures, roads, impervious areas, and graded or filled areas. Any existing modification that has impaired habitats of primary association and habitat functions should be described (as discussed in the next section). If the project includes activities to restore the habitat in these modified areas, it could help the assessment conclude that there will be no adverse effects on habitat due to the project (see also Task 2.3.3 of Step 3).

The Oregon Department of Fish and Wildlife, through its conservation strategy, includes additional actions that have the potential to result in impaired habitats including:

- coastal development and associated construction
- shoreline armoring
- alteration of hydraulic regimes
- dredging and dredged materials disposal
- aquaculture
- global climate change

Actions that impair habitats would also generally result in adverse effects on ESA-listed fish or their critical habitats.

2.2.4 Habitat Narrative

The findings of the field investigation are used to prepare a description of the habitat areas of primary association that will need to be protected. The narrative for this part of the assessment report needs to describe the presence and existing quality of the natural features that relate to the PCEs for all the species and habitat areas that were identified in Tasks 2.2.2 and 2.2.3. As described in the final paragraph of Task 2.2.2, PCEs are the key habitat components required for an ESA-listed species, as identified in the final rules that were published in the Federal Register when a species was listed. The narrative must identify what habitat functions are still relatively intact and which are impaired by previous site and/or area (e.g. sub- watershed, watershed, or basin scale) modifications.

The BO for the NFIP in Oregon states that within the Special Flood Hazard Area, all development impacts on natural floodplain functions must be fully mitigated. The mitigation standards should identify the specific development activities that require mitigation, including the following activities.

1) The addition of fill, structures, levees, or dikes, which reduces flood storage and fish refugia, impedes habitat forming processes, and increases flow volume and velocity, thereby eroding stream banks and beds and altering peak flow timing, which increases risk of injury to redds, fry, and alevin.

2) The addition of impervious surfaces, which reduces hyporheic function and stream recharge, increases stormwater runoff, pollutant loading, water temperature, velocity, and scour, and modifies peak and base flows.

3) Vegetation removal, which reduces shade, detrital input, velocity refuge, and habitat complexity, and increases stormwater runoff and erosion.

4) Bank armoring, which reduces instream habitat values and impedes habitat forming processes.

The site investigation and resulting habitat narrative must also include a description of the proposed action and existing habitat conditions.

It is possible that there may be limited information available from the sources identified in Tasks 2.2.2 and 2.2.3. The habitat narrative must note the sources of data and information and clarify where statements are based on scientific reports and data and where they are based on the professional opinion of the author. This is one of the most vital aspects of the assessment and is required in order for reviewers to evaluate the basis and relative confidence of statements related to current conditions and estimated environmental effects.

The narrative should also include a discussion of what the relative potential for channel migration is within the area being analyzed (either the project-, sub-watershed-, or watershed- scale), and what the basis is for that assessment. Migrating channels have the potential to affect several of the habitat functions described below. In addition, some land development actions may impact key habitat functions if the channel migrates into the project area. Project features may restrict where the channel can move, which can result in degradation of some riparian or instream habitat functions.

The variables listed below should be considered in order to ensure that the assessment covers all the required factors. In most cases, the analysis scale will be small, with a small contiguous action area, while some projects may include multiple sites in multiple watersheds. The extent and detail needed for the assessment will vary by the nature, scope, and scale of the proposed action. In many cases, the project will not have the potential to affect many (or any) of the habitat functions listed below. When that is the case, the assessment simply needs to make it clear why the project does not have any significant potential to degrade some or all of these variables. The list below is intended to assist jurisdictions in considering all possible impacts on aquatic habitat and ESA-listed fish species due to major land management actions. The list includes questions that should be answered in the HA with additional guidance on how to address them.

Primary Constituent Elements (PCEs)

> These are identified in the final rules that designate critical habitat for listed threatened and endangered species (see the NMFS and USFWS critical habitat map links within the References and Resources section to access final rules for ESA listed species). For example, for an inland site with Chinook salmon habitat (see box on page 18) the first three sections of the habitat narrative would cover freshwater spawning sites, freshwater rearing sites, and freshwater migration corridors. In those cases where designated critical habitat is not present near the project action area, describing available habitat in terms of the PCE variables is still recommended in order to concisely depict key habitat features. Even if designated critical habitat is not present on a site, there still may be habitat functions as described in the Oregon Biological Opinion for the species and the species may be present. If suitable habitat is present, then there is the potential for impacts to the species from project activities that will need to be evaluated. The distance and locations of

the nearest designated critical habitat relative to the project area also need to be listed so that the potential for projects to impact these mapped areas can be evaluated (e.g. via sediment transport).

Water Quality

- Does the proposed action include any activities (e.g. grading, stormwater, or road construction) that may have any potential to cause measurable degradation to water quality variables within the action area, and how was this assessed?
- If so, which water quality variables would be affected? Water quality variables that should be considered include turbidity, pH, total dissolved gas (percent of saturation), bacteria, toxics, and pollutants. In Washington and Oregon States the numeric standards for turbidity, pH, total dissolved gas, and bacteria vary by location depending on the state's designated uses for salmon and charr fish species listed for the river reach in question (i.e. spawning, rearing, and/or migration). These states have also adopted narrative criteria to supplement the numeric criteria for some variables. The narrative criteria are statements that describe the desired water quality goal, such as waters being "free from" pollutants including oil and scum, color and odor, and other substances that can harm people and fish. Information on the designated uses and the numeric and narrative criteria for water quality in Washington can be found at: http://apps.leg.wa.gov/WAC/default.aspx?cite=173-201A or in Oregon at http://arcweb.sos.state.or.us/pages/rules/oars_300/oar_340/340_041.html
- Is there any potential for the project to result in not meeting state water quality standards any water quality variables (over any temporal scale) within the defined action area? If so, which variables? How was the action area selected, and how was the assessment conducted?

  Reaches of streams that are known to be impaired and to not meet water quality criteria for one or more variables are required to be listed under section 303(d) of the Clean Water Act (CWA). If a river reach is not included on one of these lists, it does not necessarily ensure that it meets all water quality standards for all variables. It may simply mean that no sampling (if any has occurred) has demonstrated that it does not meet standards. Data on water quality variables may be extremely limited or non-existent for many stream and river reaches. Water body segments only become listed via documented repeated violations that are estimated to likely be man-caused.

  Jurisdictions in Washington should advise the Washington Department of Ecology regarding any water quality data that they are aware of that is additional to what is cited in the current 303(d) list for a specific river reach. Ecology will assess such data to see if it meets their minimum quality assurance standards, and if so, if that data may result in a change in the 303(d) list the next time they update it. Information on the 303(d) is found at: www.ecy.wa.gov/Programs/wq/303d/index.html.

Likewise, jurisdictions in Oregon should advise the Oregon Department of Environmental Quality regarding any water quality data that they are aware of, additional to what is cited in the current 303(d) for a specific river reach. Information on the 303(d) list is found at: http://www.deq.state.or.us/wq/assessment/assessment.htm.

Water body segments (i.e. stream reaches, lakes, marine waters) that appear on the 303(d) list require the preparation of a plan to restore water quality, which often takes the form of a Total Maximum Daily Load (TMDL) study. Habitat assessments should include consideration of the current status of water quality in the project action area and evaluate if the project proposal has any potential to further degrade any variables, including any that are already listed as not meeting State standards.

- If there is any potential for degradation of any water quality variables, what are the estimated effects on ESA-listed fish species and/or their designated critical habitats within the action area, and how was this assessed? In addition, what is the maximum estimated spatial scale and maximum time period when any possible impacts on ESA-listed fish species and/or their designated critical habitats might occur?

Water Temperature and Dissolved Oxygen

- Does the proposed action include any actions or regulations that may cause measurable increases in water temperature or decreases in dissolved oxygen (DO) in any locations, and how was this assessed?
- If there is any potential for measurable impacts, is there any potential for water temperature or DO (over any temporal scale) to not meet State water quality standards within the action area(s)? [see Water Quality section above for hyperlinks to standards in Washington and Oregon].
- If there is any potential for measurable impacts, what is the estimated effect (at all temporal scales) on ESA-listed fish species, and how was this assessed?
- If there is the potential for measurable impacts, what is the maximum estimated spatial scale and locations (including any downstream effects), and maximum time period when impacts on ESA-listed fish species may occur?

Low Flow Hydrologic Regimes (including hyporheic flows)

- Does the proposed action include any actions that could potentially cause changes to the magnitude, duration, or recurrence intervals of low summer baseflows at any locations, over any temporal scale, and how was this assessed?
- If there is any potential for changes, what impact would those changes have on ESA-listed fish species or their designated critical habitats in the project action area, and what is the maximum estimated spatial and temporal scale of those effects?

High Flow (flood) Hydrologic Regimes

- Does the proposed action include any actions that could potentially cause changes to the magnitude, duration, or recurrence intervals of the 10-, 50-, or 100-year flood flows in any location, and how was this assessed?
- If there is any potential for changes in flood flows, what effect would those changes have on ESA-listed fish species and/or their designated critical habitats in the project action area, and what is the maximum estimated spatial and temporal scale of those effects?

  Site flood dynamics and hydrology must be assessed to varying degrees to ensure that the analysis is adequate and appropriate for the nature of the proposed action and the habitat resources potentially at risk. Flood flow depths, volumes, velocities, and flow paths have an important effect on the way habitat is formed. The habitat assessment narrative should describe these factors with an emphasis placed on the effects of flood events on habitats. Tributary streams, seeps, stormwater outfalls, waterways that pass through the project site, and other water sources should be identified and described. This discussion may rely on and reference other flood and site hydrology studies prepared for the project and should be focused on how flood dynamics and hydrology impact local habitat areas.

  A semi-quantitative or qualitative assessment of water quantity should usually be sufficient for projects limited in scope, scale, and overall potential to result in negative impacts on ESA-listed fish populations and their critical habitats. Projects with more potential for measurable or observable negative impacts will sometimes require more rigorous examination of hydrologic or sediment regimes based on best available data including correlations to existing gage stations. They may also require more intensive field surveys and possibly 1- or 2- dimensional flow modeling to describe likely extents of inundation, water velocities, and possible changes to instream and riparian habitat due to future flood events.

Flood Velocities

- Does the proposed action include any actions that could potentially cause increases in water velocities in streams or rivers during high flow events, and how was this assessed?
- If there are any potential for increases in high flow velocities, is there also any potential for measurable increases in streambed or stream bank shear or velocities in fish habitat units (e.g. pools, glides, side-channels) that provide refugia for ESA-listed species from high velocities within the channel over any temporal scale at any locations? How was this estimated?
- If there is any potential for changes in flood velocities, what impact would those changes have upon ESA-listed fish species and/or their designated critical habitats in

the project action area, and what is the maximum estimated spatial and temporal scale of effects?

Sediment Delivery (erosion) and Sediment Regime (in-stream transport)

- Does the proposed action include any actions that could potentially cause increased rates of surface erosion, delivery of sediments to water bodies, or total loading (volumes) of sediment transported in rivers that provide habitat for ESA-listed species? How was this assessed?
- If there is any potential for sediment increases, what impact would those changes have on ESA-listed fish species and/or their designated critical habitats in the project action area, and what is the maximum estimated spatial and temporal scale of those effects?

Stream Substrate

The quality, quantity, and general distribution of substrate particle size needs to be described in those cases where there is the potential for spawning, rearing, feeding, or refugia substrate habitat to be degraded by project actions. In some cases, this may include impacts from transport of sediments downstream from the project site.

If the proposed action has the potential to deliver significant quantities of fine-sediments to stream reaches in designated critical habitat or in those areas that may otherwise provide potential habitat to ESA-listed species, the percent fines (e.g. per) would need to be estimated and the analysis methods described. Fine sediments are defined in Washington Administrative Code regarding water quality as the fraction of all particles in a given stream reach with sediment less than 0.85 mm in diameter. This information is required to describe current habitat conditions and estimate how (if) any additional inputs of fine sediments may degrade the current quality of stream substrate habitat.

In those cases where sediment impacts may be a significant concern, it may also be necessary to fully describe current substrate conditions in those stream reaches that could be impacted. If this is the case, the description should include the general range of substrate types that currently exist across each different channel type in potentially affected stream reaches.

The specific questions that need to be addressed are:

- Does the proposed action include any actions that could potentially cause increased rates of aggradation of fine sediments (those less than approximately 0.85 mm diameter, i.e. sand, silt, and clay particles) or coarse-sediments on potential substrates for spawning, feeding, rearing, or migration? How was this assessed?
- If there is any potential for increased sedimentation, what impact would those changes have on ESA-listed fish species and/or their designated critical habitats

in the project action area, and what is the maximum estimated spatial and temporal scale of effects?

Floodplain Connectivity

Disconnecting a river from its floodplain impacts several other functions that directly affect the quality and quantity of habitat that supports ESA-listed species. Connectivity affects the potential for natural lateral migration and hydrologic connectivity between the stream and its floodplain, including groundwater systems and the production and utilization of organic matter by riparian and aquatic communities.

Hydrologic connections provide temporary storage of floodwaters, while also providing key off-channel habitats and a source of water during dry summer base-flow periods. Many urbanized watersheds have lost these functions to varying degrees. If the stream is largely disconnected from its floodplain, the stream ecosystem cannot maintain its biological diversity nor can it recover from major episodic disturbances. Some of these diverse habitat types also provide refuge from high velocity flows during flood events (see discussion below).

The habitat assessment needs to describe the current condition of floodplain connections and processes. This can usually be accomplished in a brief narrative via a combination of a site visit and examination of aerial photography and FIRM maps (if they exist). Some of the conditions that should be noted include, but are not necessarily limited to, the extent of the channel migration zone, general channel geometry in potentially affected stream reaches, including the distribution and size of riffles and pools, and identification of any side-channels and tributaries. Specific questions that need to be addressed include:

- Does the proposed action include any actions that could potentially affect the extent and level of the connection of stream channels to their floodplain? How was this assessed?
- If there is any potential for changing the extent or level of floodplain connectivity, what impact would those changes have upon ESA-listed fish species and/or their designated critical habitats in the project action area, and what is the maximum estimated spatial and temporal scale of effects?

Refugia for ESA-listed Fish Species from High Velocity Flows

- Does the proposed action include any actions that could potentially affect the location, extent, or quality of habitat available for ESA-listed fish species from high velocity flows in side channels and other areas across the floodplain when over-bank flows occur? How was this assessed?
- If there is any potential for changes in the extent or quality of refugia, what impact

would those changes have upon ESA-listed fish species and/or their designated critical habitats in the project action area, and what is the maximum estimated spatial and temporal scale of those effects?

Riparian Vegetative Community

The riparian vegetation along a stream provides many functions including bank stability, food input to streams, nutrient cycling, potential for recruitment of large woody debris to streams, shade, buffering of sediment and pollutants. The habitat assessment should include, but not necessarily be limited to, a description of existing conditions throughout any mapped channel migration area. Freshwater riparian conditions should be characterized by describing conditions as they relate to the riparian habitat functions. In Washington State those functions are discussed in the Washington State Department of Fish and Wildlife's (WDFW) guidance for Management Recommendations for Washington's Priority Habitats: Riparian (see Appendices B and C at http://wdfw.wa.gov/publications/00029/). In Oregon State those functions protected through the Riparian Management Act are discussed in the Oregon Department of Environmental Quality, Department of Forestry, and Department of Agriculture's Oregon State Program for Managing Riparian Resources (see Appendix B at http://www.oregon.gov/OPSW/docs/AppndxBstds.pdf).The habitat functions that riparian communities affect include water temperature control, recruitment of large woody debris, filtering of sediment and pollutants, erosion control, bank stability, and influence on microclimatology.

Characterization of marine shoreline conditions should be consistent with guidance from state agencies, such as the WDFW's and Ecology's (Land Use Planning for Salmon, Steelhead and Trout) and with other Puget Sound nearshore guidance materials listed in the References and Resources section. Questions that should be addressed include:

- Does the proposed action include any actions that could potentially degrade the quantity or quality of the riparian vegetative community? How was this assessed?
- If the project has any potential to affect riparian vegetation, describe the general species, sizes, areas, and percent cover of existing levels of riparian vegetation.
- If the project has any potential to affect riparian vegetation, describe the general species, sizes, areas, and percent cover that would result from the proposed action.
- If there is any potential for degradation of the riparian vegetative community, how would:
    - The extent, rate, and quality of nutrient cycling, buffering, food input

from terrestrial sources to streams (i.e. allochthonous food), and recruitment of large woody debris be impacted?

    - The extent and quality of bank stability and stream shading to be impacted?

- If there is any potential for degradation of some of the functions that the riparian community provides, what impact would those changes have on ESA-listed fish species and/or their designated critical habitat in the project action area, and what is the maximum estimated spatial and temporal scale of those effects?

2.2.5. Habitat Area Map

Once all habitat areas of primary association are identified and described, they should be delineated on a map. The map should be at the same scale as the project area map (Task 2.1.2) to facilitate comparison of the habitat to be protected with the extent of the Protected Area, Special Flood Hazard Area, Floodway, the riparian buffer zone, and other relevant features such as watercourses and wetlands.

2.3 Step 3. Describe the Project

There are two key parts of the project that need to be described at this stage of the assessment report: 1) the final project, i.e., what the area will look like and how it will be used when the project is completed; and 2) the construction process that will be followed to get there. The description of the final project should be covered first. Measures taken by the proponent to avoid, minimize, replace, or compensate (the descending order of preference of the mitigation sequence) for degradation to the habitat functions must be described in enough detail to allow assessment of all the effects of the proposed action.

As described for Task 2.1.1, if an Oregon State JPA form has been prepared for the project, it will include general project description information, but usually additional information will be needed for the habitat assessment. More information regarding the Oregon application process and JPA form template can be found at the Oregon Department of State Lands website at: http://www.oregon.gov/DSL/WW/Pages/Permits.aspx.

If the information that is already being provided in the JPA includes the level of detail described in this guidance, then the community may accept the application form as sufficient for the project description. If a JPA has not been prepared for the project, the project area description should, at a minimum, include the information included in Tasks 2.3.1 and 2.3.2 of this section.

2.3.1 Final Project

All features of the proposed completed project must be described. This includes, but is not necessarily limited to:

- A summary of the project, including all features that will be present when construction is finished
- Project category (industrial, commercial, residential, institutional, transportation, recreational, maintenance, agriculture, or environmental restoration)
- A description of the general design, location relative to nearest water bodies, and general dimensions of the footprints of any structures and facilities including, but not necessarily limited to: buildings, boat launches, docks, pilings, fences, roads, bridges, culverts, trails, roads, or paved areas
- Detailed descriptions of all structures or facilities that would potentially impact water bodies or wetlands including, but not necessarily limited to: aquaculture, buoys, mining, bank stabilization, channel modifications, culverts, dams, levees, ditches, fishways, moorage, or outfall structures
- Descriptions of above and underground utilities
- Descriptions of water supply
- Descriptions of wastewater disposal
- Descriptions of stormwater management facilities
- Descriptions of non-native landscaping

The level of detail needed for these descriptions will vary according to the nature, scope, and scale of the project, and its location relative to ESA-listed species and their potential habitats. Assessments should include as much information as is needed to adequately describe and estimate potential environmental effects. In some cases, there may be little or no potential for adverse effects; therefore, in those cases, it may require relatively less information and discussion to document potential effects.

Project details, nearby stream courses, and any key floodplain features need to be mapped, and those features should be shown on the project area map(s) (Task 2.1.2). Project Area Maps should show how project details relate to stream conditions appearing on the Habitat Area Map(s) (Task 2.2.5).

There should also be a description of:

- Any ongoing activities that will be conducted at the site after construction is complete.
- Any ongoing activities that will affect adjacent areas, including, but not necessarily limited to, increases in traffic, stormwater runoff from the site, noise, and changes air quality.

2.3.2 Construction Process

At a minimum, the description of the construction methods should cover the following points:

- Land clearance (areas to be cleared and native vegetation that will be removed)
- Any work in-water, including a description of the methods and materials used
- Grading and filling
- Stormwater management measures to be taken during construction
- Utility installation (including any on-site wastewater treatment)
- Methods and techniques for construction of structures, including buildings, roads, bridges, paved areas, retaining walls, shoreline modifications, and types of equipment to be used
- Construction phasing and anticipated construction timing
- Mobilization and staging plans
- Temporary construction access and staging areas

Maps and a timeline should be included to show where and when each activity will occur.

2.3.3 Protection Measures

There are several federal, state, and local regulatory requirements that require development projects to include measures that avoid, minimize, replace, or compensate for negative effects on populations or habitat functions due to project impacts. The applicant may propose additional measures. The habitat assessment must list the protective measures that will be implemented, and clarify which are required and which are recommended. All required and recommended measures should be described. They could include, but are not necessarily limited to, the examples below.

- Preserving a setback area from any disturbances, or any other measures that avoid negative impacts on ESA-listed species or their habitats.
- Drainage/erosion control plans to be implemented during construction.
- Post-construction stormwater and erosion control plans.
- Use of low impact development techniques (which may eliminate or reduce runoff from areas to be developed).
- Any other measures that minimize negative impacts on ESA-listed species or their habitats.
- Actions to implement wetland mitigation plans.
- Any other measures proposed to reduce potential negative impacts during or after construction is complete, such as sedimentation basins, should be included and described as part of the project design and included in the project timeline.

- Compensatory storage provisions to replace lost floodplain storage[1] that are able to demonstrate that they will not potentially strand fish.
- Any other forms of on-site or off-site compensation for degradation of habitat functions that support ESA-listed species.
- A description of any adaptive management program that will be utilized. This should include, but not necessarily be limited to, a description of what monitoring would be conducted to track both implementation and effectiveness of mitigation measures, what would trigger adaptive measures, what those measures would be, and what method will be used to determine if they are sufficient and successful.

  Adaptive management refers to a structured, iterative process intended to enable decision-making under conditions that include some uncertainty. The goal is to reduce that uncertainty over time by monitoring project site conditions before, during, and after construction, as well as the effectiveness of project design elements and mitigation measures. Possible components of an adaptive management plan include, but are not necessarily limited to the following topics.

  - Monitoring and resultant possible changes in project management (e.g. variations in mitigation measures) are based on spatial and temporal scales of analysis that are appropriate for the project in question, and the basis for those scales is explained. This includes the location(s), duration, and frequency of monitoring.
  - The variables selected for monitoring are appropriate and practical to track project impacts and the effectiveness of best management practices and mitigation measures.
  - Monitoring results can and will be used in a direct way to decide what, if any, changes need to be made to achieve the desired future condition for the project. For many projects the desired future condition is obvious and can be easily stated. For more complex projects, the minimum parameters needed to adequately define the desired future condition will need to be determined and clearly described.
  - Adaptive changes to the project would be based on existing best management practices and best available science to the greatest extent possible.

[1] Compensatory floodplain storage requirements are included in Section 7.6 of the Model Ordinance. This section requires that compensatory storage areas must be graded and vegetated to allow fish passage during flood events without creating fish stranding sites. Areas of compensatory flood storage should be designed to create floodplain habitat whenever feasible. Compensatory storage should not be used in areas prone to avulsions because lowering floodplain elevations or digging pits in these areas may increase the probability of an avulsion.

2.4 Step 4. Assess the Environmental Effects

The habitat assessment must analyze the direct and indirect effects of the proposed action on ESA-listed species and their aquatic, riparian, and floodplain habitat areas identified in Step 2, as well as the cumulative effects of future actions that are reasonably certain to occur. Important factors to be considered in the assessment include, but are not necessarily limited to the following considerations.

- The proximity of the action to individuals of the species present, habitat management units, or designated critical habitat units. This includes assessing the likelihood of measurable or observable impacts on fish or their designated critical habitats based on the relative location(s) of the action and nearby populations and habitats. For example, habitats located well downstream of an action that is expected to deliver significant volumes of sediment to a stream near the project site may still be measurably impacted if those sediments may be routed (transported) downstream to areas of concern. The appropriate temporal and spatial scales of analysis will vary by the variables of concern and nature of the project and must be described in the assessment.
- The spatial distribution of an action over one or more action areas or sub-watersheds. The analysis should consider the accumulated effects of impacts in multiple locations and/or cumulative effects due to the combination of project effects added to the effects of other nearby, reasonably foreseeable future, non-federal actions.
- The timing of the proposed action relative to sensitive periods of the lifecycles of any potentially impacted ESA-listed species, and how that timing may result in negative impacts.
- The nature, scale, scope, and duration of the effects of the proposed action on the sub-population size, growth and survival, life cycle, diversity, isolation, and genetic integrity of ESA-listed species that could potentially be affected. Assessments should include as much information as is needed to adequately describe these population variables. In some cases, there may be little or no potential for adverse effects with respect to these variables, so relatively little discussion will be needed.
- The nature, scale, scope, and duration of the effects of the proposed action on the PCEs of any designated critical habitat, including any direct, indirect, interdependent, interrelated, or cumulative effects. In freshwater systems, PCEs generally include adequate water quality, water quantity, and substrate (free of fine sediments) for spawning, incubation, and larval development, floodplain connectivity for rearing, and stream channels free of man-made obstructions (obstructions may include physical, water temperature, or chemical barriers). The habitat assessments should include as much information as is needed to adequately estimate potential effects on these habitat variables. In some cases, there may be little or no potential for adverse effects on these variables, so relatively little discussion will be needed.

- There are three potential categories of effect on designated critical habitat that relate to the duration of the effect: 1) a short-term events where effects reduce to negligible levels soon after construction activities cease; 2) actions that may result in sustained long-term negative effects that are measurable or observable after the proposed action is completed; and 3) actions that cause permanent changes, resulting in a new threshold (condition) for some population or habitat functions of an a ESA-listed species and/or its critical habitat. 'Short-term' effects will never persist more than one year beyond construction durations (e.g. removal of native vegetation due to construction that is replaced within one year), and in the case of significant inputs of sediment or pollutants, may not persist for more than a few hours to a few days at most.
- The frequency of any negative impacts due to the proposed action, described as the mean number of events per an appropriate time basis for the proposed action. This rate must then be compared against best available data on the estimated recovery rates of any potentially affected species to assess how those species would likely be impacted by multiple disturbances (if such occurs). The duration of each event may vary. A recurring event of short duration will in some cases result in a smaller net impact than one event of a much longer duration, but the opposite may also be true depending on the nature of the disturbance.
- The severity of any negative effects on ESA-listed fish or their designated critical habitats that may potentially occur due to the actions of the proposed project. In this context severity is not analogous to intensity or scale, but it is closely related. With a "severe disturbance," affected fish would take a longer time to recover, due to the both the intensity of effects as well as the effects of the other variables described above.

2.4.1 Types of Environmental Effects

The References and Resources section at the end of this document lists resources that have additional guidance for the assessment of environmental effects. The habitat assessment should assess direct, indirect, and cumulative effects.

Direct effects: According to ESA rules and regulations, direct effects occur at or very close to the time of the action itself. Examples include, but are not limited to: construction noise disturbance, loss of habitat, or sedimentation that results from the construction activity. Direct effects include the effects of interrelated actions. Such actions are part of the proposed action and depend on the proposed action for their justification. Direct effects also include interdependent actions, which are activities that have no independent utility apart from the action under consideration. Neither interdependent nor interrelated actions would occur 'but for' the implementation of the proposed action.

The discussion of direct effects must include information on the temporal and spatial limits of the effects, species tolerances, severity of effect, mortality and other forms of take (including harm), and expected habitat loss as a result of the proposed action. Identification of the appropriate

estimated temporal and spatial scales of potential impacts are key to assessing environmental consequences. It is recommended that a table or list of appropriate scales for each pertinent issue (e.g. possible erosion and delivery of sediments to stream channels, water pollutants, changes in instream or riparian habitat, changes in hydraulics, etc.) be created to document appropriate scales of analysis for the nature and location of the proposed action. Habitat assessments only need to address those habitat functions and processes that the project has the potential to affect, while also explaining (as briefly as is practicable) why those are the only functions that may be impacted.

The direct impacts a project might have on a habitat area include, but are not limited to:

- Permanent clearing and grading of any habitat area
- Temporary clearing and grading of any habitat area during construction
- Permanent structures, pavements, etc., constructed within or placed within a habitat area
- Modification of a stream channel or side channel, including bank stabilization measures and removal or changes to large woody debris (other than stream restoration efforts)
- Diversion of water that will change the hydrologic or sediment regime in the project action area

Indirect effects: Indirect effects are also caused by or result from the proposed action; however, they are likely to occur later in time. They may occur outside of the area directly affected by the action. Indirect impacts include, but are not limited to:

- Disrupting high or low stream flows, including impacts from stormwater runoff
- Contributing to sedimentation that fills in substrate
- Blocking a corridor that connects habitat areas
- Increases in water temperature or degradation of chemical or biologic water quality parameters through removal of riparian vegetation or other actions
- Disturbance of riparian vegetation (for example, clearing vegetation to the edge of a forested riparian area)
- Moving or removing large woody debris
- Destabilizing banks or altering natural lateral or vertical channel migration or channel forming processes
- Degrading wetland areas through disturbance of adjacent vegetation or modification of hydrology

Cumulative effects: Under the ESA, cumulative effects include the effects of foreseeable future state, tribal, local, or private actions that are reasonably certain to occur in the project action area.

Project assessment cannot be segmented under the ESA. It is not permitted to break the project down into small segments that may have low levels of impacts when considered separately. The entire scope of the direct, indirect, interdependent, and interrelated actions must be considered, including any possible residual effects that may overlap with other reasonably foreseeable projects that could result in cumulative effects in the area(s) defined for analysis.

Permit officials are required to review the cumulative effects of all projects when the proposed action has the potential to produce any measurable or observable negative effects. The cumulative effects section should not simply be a list of other projects. It must in some manner describe the estimated accumulated impacts of future projects that are reasonably certain to occur, superimposed upon the baseline of current conditions and the expected impacts of the proposed action.

2.4.2 Report Format

There is no single required format for a NFIP habitat assessment, but such assessments must contain sufficient information and analysis to be able to fully describe the impacts of the proposed action on ESA-listed species and their habitats. Similarly, neither NMFS nor USFWS (often jointly referred to as the 'Services') requires a specific format that biological assessments must follow. The main reference that the Services refer to, and recommend applicants fully comply with, is the Consultation Handbook (NMFS, USFWS 1998).
http://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section7_handbook.pdf

It's a large document that includes chapters and appendices that stress the contents (versus format) needed in a biological assessment, along with examples of such assessments. However, there are also a number of examples of formats that are sometimes employed by various agencies that may be helpful for jurisdictions to refer to that can supplement the recommendations in this guidance. One useful reference that describes suggested contents and format for a biological assessment is titled "Recommendations for the Contents of Biological Assessments and Biological Evaluations" (NMFS), which is available at:
http://sero.nmfs.noaa.gov/pr/pdf/BA_guide_comboeh081105.pdf

Another format that is often used in the Pacific Northwest is the Matrix of Pathways and Indicators (NMFS 1996 and USFWS 1998). This approach assesses both the current condition and the estimated effect of the proposed action on 18 'indicators' of population and habitat conditions that fall under six broader 'pathway' categories. This approach is useful because it breaks down the assessment into a repeatable, manageable number of specific topics. The NMFS version can be found at:
http://www.nwr.noaa.gov/publications/reference_documents/esa_refs/matrix_1996.pdf.

The only significant difference between the NMFS and USFWS versions is that the suggested thresholds for when the current conditions of an indicator is 'properly functioning', 'at risk', or 'not properly functioning' varies between the Services. The narrative for the matrices emphasize

that these specific threshold metrics do not need to be used and can be replaced by other metrics that are more appropriate for the watershed in question, if the deviation can be explained.

The outline below is a variation on the U.S. Army Corps of Engineers (USACE) Biological Assessment Template guidance regarding how to describe the effects of a proposed action in a biological assessment. It is included in the Endangered Species Section of USACE Permit Guidebook online resource at: http://www.nws.usace.army.mil/Missions/CivilWorks/Regulatory/PermitGuidebook.aspx. All of the components of this USACE outline must be covered in some manner, but the format may vary.

A. Direct effects
    1. First PCE (e.g., freshwater spawning sites)
    2. Second PCE (e.g., freshwater rearing sites)
    3. Third PCE (e.g., freshwater migration corridors)
    4. Additional PCEs as appropriate
    5. Essential Fish Habitat designated by the National Marine Fisheries Service
    6. Fish and Wildlife Habitat Conservation Areas
    7. Vegetation communities and habitat structures
    8. Water quality
    9. Water quantity, including flood and low flow depths, volumes, and velocities
    10. The channel's planform pattern and migration processes
    11. Spawning substrate, if applicable
    12. Floodplain refugia, if applicable
B. Indirect effects - see the list on the previous pages of this document and include consideration of indirect effects with respect to items A.1 through A.12, above, that are applicable to the proposed project
C. Effects from interdependent and interrelated actions
D. Cumulative Effects
E. Effects determinations – see following section
F. Summary

2.4.3 Effects Determination

Following the evaluation of potential effects, the HA should make a determination of the effect of the proposed development on ESA-listed species. The effects determination should be one of the following options.

- **No Effect (NE):** The project will have no effect whatsoever on listed species and designated floodplain functions. If work affects any items evaluated in the HA section above, an NE determination is typically not appropriate.
- **May Affect, Not Likely to Adversely Affect (NLAA):** The appropriate conclusion when effects on the species or floodplain functions that support those species are expected to be beneficial, discountable, or insignificant - even when considering direct, indirect, and cumulative impacts. Beneficial effects are positive impacts without any adverse effects on fish or habitat. Insignificant effects refer to the size of the impact and should never reach the scale where “take” occurs. Discountable effects are those extremely unlikely to occur due to timing. Based on best judgement, a person cannot meaningfully measure, detect, or evaluate insignificant effects or expect discountable effects to occur. The term "negligible" means the same as "insignificant" (immeasurable).
- **Likely to Adversely Affect (LAA):** The effect of the project is likely to result in a short or long-term adverse effect on listed species or floodplain functions.

An effects determination needs to be made for each project action analysis area. In most cases, there will only be one analysis area. The spatial scale of the analysis area will be dependent on the nature, scope, and extent of the proposed actions that are being assessed. The analysis area for an individual project site may be as small as a stream reach, while a project with multiple, related sites may be assessed at a sub-watershed (e.g. 6th-field Hydrologic Unit Code (HUC)) or watershed (5th-field HUC) scale. In every case the rationale for the spatial scale of analysis must be explained. The current (baseline) habitat conditions and the effects of the proposed action on ESA-listed species and their designated critical habitats must be described for the entire analysis area.

Determinations for individual analysis areas could be utilized to make an overall project effect determination if there are more than one analysis areas for multiple interrelated or interdependent project actions. For example, if the effects determination for all areas is No Effect (NE), then the overall determination for the project proposal would be No Effect. However, if actions at some locations would result in a determination of No Effect, while related project actions in other areas would result in a determination of May Affect, Not Likely to Adversely Affect (NLAA), the overall call for the project would be NLAA since it represents the determination with the most potential for negative impact on species or habitat.

In the prior example. The overall determination would be NLAA. In the same manner, if the determination for one or more analysis areas is May Affect, Likely to Adversely Affect (LAA) some ESA-listed species or their designated critical habitat, then the overall call is LAA, even if the determination for other interconnected or interrelated projects is NLAA or NE. It is critical to document how the effects determinations were reached.

If the effects determination is NLAA, the report should indicate what steps were taken to avoid and minimize any negative project impacts. For example, the permit applicant could time certain construction work to occur when the species are not present in the project area.

If avoidance and minimization measures do not eliminate the potential for long-term adverse effects due to actions outside of the Protected Area and riparian buffer zone, the project cannot proceed as designed. In those cases, additional replacement and/or compensatory measures need to be included in the mitigation plan (see Steps 5 and 6) in order to result in a net, long-term neutral or beneficial impact on ESA-listed species and their designated critical habitats.

If the assessment concludes that the determination for the overall project is LAA due to project actions occurring within the Special Flood Hazard Area, the project will not be covered under the existing NMFS BOs for Oregon. In these cases, the project must either be redesigned to avoid those adverse effects, the project must be dropped, or the proponent may seek ESA coverage via separate consultation under Section 4(d), 7 (if another federal agency is involved in authorizing, funding, or undertaking the proposed project), or 10 of the ESA.

2.4.4 Habitat Assessment Report

If the effect determination is No Effect (NE) or May Affect, Not Likely to Adversely Affect (NLAA), the report should be prepared and submitted to the community's permit office. For NLAA determinations that include avoidance and minimization measures, the assessment must include enough detail to show how the measures are related to potential project impacts.

The assessment report must include all the information needed to support the effects determination and the rationale for reaching the conclusion(s). It may be organized to follow Steps 1 through 4 as outlined in this document. The level of detail should be commensurate with the level of anticipated impacts. Projects with significant impacts or the potential for significant impacts (due to project type and/or project location) would require more detailed review and analysis.

If the assessment makes a determination of Likely to Adversely Affect (LAA) or NLAA the assessment will need to proceed to Step 5.

2.4.5 Preparing the Mitigation Plan

The following sections (Steps 5 and 6) provide guidance on preparing a mitigation plan, including reference to any other pertinent habitat-specific restoration and mitigation guidance materials developed for the area under consideration. The final objective of floodplain habitat mitigation is to ensure that there is no adverse effect on quality or quantity of natural habitat functions and processes within the Special Flood Hazard Area (with the limited exemptions for each area listed earlier in this guidance). Step 6, Task 2.6.1 of this guidance provides additional recommendations on mitigation objectives, including specific requirements for mitigation throughout the the SFHA (i.e. the 100-year floodplain).

For many development proposals, the permit conditions and mitigation actions required to meet other local and state permit requirements may also provide sufficient mitigation for the impacts identified through Step 4 of this guidance. In such instances, permit conditions and required mitigation actions may overlap to serve as mitigation for impacts on floodplain habitats as required by the local floodplain management ordinance. However, the conditions and mitigation proposed must be sufficient to mitigate for all floodplain habitat impacts in order to meet the objective of no adverse effect on habitat for ESA-listed species.

2.5 Step 5. Review Mitigation Alternatives (Mitigation Sequencing)

There are four major types of alternative mitigation approaches to rectify an adverse effect. In descending order of preference and effectiveness they are: avoidance, minimization, rectification (replacement), and compensation. This mitigation sequence hierarchy directs that those impacts that can't be avoided must be minimized, and impacts that remain after taking steps to minimize shall be restored and/or compensated for to the fullest extent practicable. On-site, in-kind compensation is preferred over off-site and/or out-of-kind compensation. The necessity for use of the latter must be explained and justified. Successful mitigation is dependent upon adequate monitoring of both the actual (versus planned) implementation of mitigation measures, and the effectiveness of those measures to accomplish the stated objectives in the Mitigation Plan (see Step 6 below). The results of that monitoring may trigger adaptive management to accomplish those goals.

2.5.1 Avoidance

Avoidance is the preferred approach. FEMA recommends that new land development actions remain outside of the floodplain. Avoidance prevents additional adverse effects on aquatic and riparian habitats, while also precluding any risks to public safety and property from possible increased frequency, duration, or magnitude of flooding that would result from further development in the floodplain. Avoidance also largely eliminates the need and expense of mitigating adverse effects on aquatic and riparian habitat. The permit applicant should strongly consider relocating or redesigning proposed projects to avoid impacts on floodplain habitat functions and the need for a mitigation plan.

Communities should consider incentives to encourage permit applicants to avoid development within the floodplain. Many communities currently use many strategies to encourage conservation of key areas by allowing for development at a more intense level in other areas. These are usually provisions of a zoning ordinance or separate development regulations. Here are three approaches that some jurisdictions use to encourage floodplain conservation.

1. Providing density incentives to individual property owners: A density incentive or density credit system would allow specified land uses to occur at a more intense level within the portion of a parcel outside of the floodplain as compensation for conservation of flood-prone areas within the parcel. For example, if a 20-acre parcel

is zoned for one acre lots and half of the parcel is in the floodplain, the community might consider allowing the ten "dry" acres to be developed with half acre lots, allowing the development to still construct 20 homes. This would allow for a higher density of development in a portion of the property and would require the remaining, high-habitat value floodplain to be conserved as a dedicated tract. This strategy is similar to the approach of clustering development, such as is often used in planned unit developments. Under both approaches, the overall project does not exceed the development density allowed by the zoning district.

2. Transfer of development rights: Transfer of development rights (TDR) programs allow for the transfer of development density from one parcel of land (with some conservation value, such as a floodplain or wetland) to another parcel or area that is planned for higher density development. Implementation and administration of TDR systems has proven challenging in many circumstances, due to the required coordination in establishing density receiving and density giving areas, and in negotiating density credit values. However, a community, regional, or watershed-based TDR system may be a successful strategy for floodplain avoidance.

   As an example, King County's TDR program is a voluntary, incentive-based, and market-driven approach to preserve land and steer development growth away from rural and resource lands into King County's Urban Area. The Program is based on free-market principles and prices that would motivate landowner and developer participation. Rural landowners realize economic return through the sale of development rights to private developers who are able to build more compactly in designated unincorporated urban areas and partner cities. To date the Program has protected 141,500 acres of rural/resource land.

3. Tax relief for conservation lands: Tax relief is a financial incentive that has proven to help discourage development of sensitive lands. As an example, King County, Washington, has an established system of providing property tax relief for lands that are established as conservation areas. All properties must meet certain criteria and approval is not automatic. Such a system could provide an additional venue to encourage conservation of floodplain lands. However, tax relief systems generally do not provide permanent protection for natural resources as they often are terminated when the property ownership transfers.

2.5.2 Minimization

If the entire project cannot avoid some development within the floodplain, it may be possible that it can be designed to minimize the physical area and magnitude of impacts on aquatic and riparian functions by preventing development in identified high-value habitat areas, and/or by changing the construction design of the project. For example, while water access may be necessary for some projects (namely those that are inherently water dependent), the design might place most buildings and pavement out of the riparian buffer zone. Some ideas for minimizing impacts include:

- Siting the project footprint away from the higher value habitat areas.
- Designating buffer areas that are not disturbed during or after construction. (Note that Section 7.4 of the Model Ordinance option for Puget Sound prohibits removing vegetation (other than noxious weeds) in the riparian buffer zone without mitigation.)
- Including vegetation measures around the site's active use areas.

Many adverse effects result from degradation of natural processes or functions caused by actions during the construction period. Some best management practices to avoid these types of problems include, but are not necessarily limited to:

- Perform all work in dry weather and/or during the dry season.
- Incorporate erosion and sedimentation control measures.
- Use vegetable oil-based hydraulic fluids in all equipment working in water.
- Prepare and train crews on a spill prevention and pollution control plan, and require that all equipment needed to contain a possible spill is available on-site before construction activities begin.
- Store, stage, and refuel equipment outside the riparian buffer zone.
- Inspect equipment daily for leaks.
- Time specific phases of work to occur during "species work windows," when the species are not present or will not be affected.

2.5.3 Replacement of Degraded Habitats

A project's plans must, to the maximum extent practicable, include provisions to replace (rectify) those habitat functions that were degraded by project actions. The baseline is the condition of the site immediately prior to the proposed action, not historic conditions at the site. As an example, wetlands, channels, and riparian areas can potentially be repaired or rebuilt after the land clearance, grading, and filling is concluded. All areas temporarily cleared should be re-vegetated with native plants.

In some cases, incorporation of avoidance, minimization, and replacement actions may have a net result of maintaining or even improving natural habitat functions and processes relative to pre-project conditions. The box to the right provides an example, where conditions in a stream in Jefferson County, Washington were improved by replacing a culvert with a bridge of adequate span.

When the Tarboo Creek bridge was replaced in 2004, Jefferson County used the opportunity to partially restore natural habitat functions and processes. The former, shorter bridge confined the channel, resulting in high stream velocities that impeded travel of some species of fish, including salmonids. The new arrangement improves fish passage and carries higher flood flows without overtopping the road.
– Source: *Engineering with Nature*, FEMA

2.5.4 Compensation

In those cases where complete (or nearly complete) replacement of habitat is not practicable, compensation is the next action in the mitigation sequence that should be considered.

Compensation varies from in-kind, on-site compensatory actions, to off-site, out-of-kind actions. If the action literally restores the specific functions that were degraded at the same location where they were impacted, the compensation would be synonymous with replacement. This type of compensation is preferred. When it is not possible, off-site and/or out-of-kind compensation should be conducted when practicable. Compensation measures should account for the habitat functions and elements identified in Step 2. Some functions, such as a freshwater migration corridor, are not possible to adequately compensate via actions at other locations. Off-site, out- of-kind measures are the least preferred. When these measures are used, applicants need to explain why they are the only viable form of compensation for the project proposal and how they would provide adequate mitigation.

The applicant should also keep in mind that the area required for constructed compensatory habitat is generally greater than the area of impact because of the length of time it takes to successfully create a properly functioning stream side channel, wetland, or upland floodplain habitat area that provides similar quality and quantity to the affected habitat functions.

Auburn Narrows floodplain restoration project along the Green River, King County. This project was funded by a developer of a nearby site in order to compensate for the adverse effect of a floodplain development. The project included creation of side-channel habitat, off-channel habitat, and riparian habitat.

– ESA Adolfson

2.5.5 Select the Best Approach

Selecting the best mitigation approach for the proposed project is an iterative process. Avoidance should be considered first as the preferred choice. If work must be done in a sensitive area, the project proponent should consider the costs of restoration and compensation. If those costs are too high, then avoidance should be reconsidered.

Selecting the best mitigation approach should be done in conjunction with the local, state, and federal regulatory offices for technical assistance regarding the discussion of preliminary project designs and assessment of environmental effects. Assistance from these sources, as well as possible review and assistance from neighboring tribal representatives, can greatly aid in designing an appropriate sequence of mitigation of actions. Early and periodic meetings with appropriate regulatory agencies will increase the likelihood that a mitigation plan will meet all regulatory requirements and can reduce total project costs and the probability of schedule delays during the approval process.

2.6 Step 6. Prepare the Mitigation Plan

2.6.1 Objective

As noted in Step 5, the objective of the mitigation plan is to assure that actions are taken to sufficiently and appropriately mitigate for negative impacts on ESA-listed populations and the natural functions and processes that support their habitats. The mitigation plan needs to provide sufficient detail to demonstrate how this will be done, using avoidance, minimization, replacement (rectify), and/or compensatory measures.

Minimization, replacement, and compensation measures are available as methods to mitigate for adverse effects anywhere within the Oregon Special Flood Hazard Area. The long-term net result must be neutral or beneficial for ESA-listed species and their designated critical habitats. Some example options that may be considered include the following mitigation approaches.

- Doubling, tripling, or further increasing the area of compensatory mitigation to offset the difference in quality and function of the lost habitat versus constructed habitat (thereby increasing the mitigation ratio of area of habitat impacts to area of compensatory mitigation provided).
- Identifying additional areas of previously degraded habitat within the project area and developing and implementing a plan to restore those areas.
- Implementing restoration actions that are targeted as a high priority by an adopted and approved species recovery plan, when such actions are identified within the same 5th-field Hydrologic Unit Code (HUC) or Watershed Resource Inventory Area (WRIA) watershed as the proposed action and approved by local, state, and federal permitting agencies.
- Adopting a plan that would adaptively manage and, if necessary, adjust the mitigation plan based on the results of monitoring both the implementation and effectiveness of the planned mitigation measures. The plan would have established metrics for the mitigation plan (e.g. replanting success rates after a set period of time) to assure that any adverse effects from actions outside of the Protected Area are minimized to the fullest extent practicable.

For all mitigation, the final plan (construction level detail) should not be drafted until the local permitting office(s), in coordination with state and federal agencies as necessary, has agreed that the conceptual mitigation plan would meet the objectives. Coordination with local permitting officers will ensure that the scope of the planned mitigation will be commensurate with the scale of the impacts and will meet the objectives identified above.

2.6.2 Format

Many communities have established formats that they have used to document mitigation plans within environmental or biological assessments. These formats are likely adequate for purposes of the NFIP. In Oregon, refer to Chapter 3 of *Wetland Mitigation Banking Guidebook for Oregon: Approval Process and Documentation*

Here is an example mitigation plan outline:

1. Introduction, background, objectives
2. The project area, with map (taken from Step 1 of the assessment)
3. The project area's habitat, with map (taken from Step 2 of the assessment)
4. Project description (taken from Step 3 of the assessment)
5. Impact on habitat (taken from Step 4 of the assessment)
6. Alternatives considered (taken from Step 5, this should note why some alternatives, especially avoidance, were not selected)
7. Mitigation concept (an overall explanation of the measures)
8. Construction measures
    a. Grading plan, with existing and post-construction topographical maps
    b. Construction methods (e.g. equipment to be used)
    c. Construction schedule
9. Permanent measures
    a. Surface water management
    b. Vegetation plan
    c. Permanent buffer areas
    d. Etc.
10. Post-construction monitoring and maintenance plan
11. Bond arrangements

2.6.3 Minimum Standards

At a minimum the mitigation plan's components 7, 8, 9, 10, and 11 of the outline above should be consistent with the mitigation guidance requirements of the Army Corps of Engineers and Chapter 3 of *Wetland Mitigation Banking Guidebook for Oregon: Approval Process and Documentation, or* Oregon Division of State Lands Chapter 8 *Compensatory Mitigation Planning* (see Reference section). In Oregon, mitigation plans must also be consistent with the community's Goal 5 implementation plans. If there are inconsistencies between these

requirements, the standards that provide the highest level of environmental protection and the greatest likelihood of mitigation success take precedence.

3.0 Reviewing Habitat Assessments and Mitigation Plans

This section provides guidance for the local permit official. The following strategies may be used to ensure that habitat assessments and mitigation plans are prepared by a qualified individual or company and meet the intent of the Model Ordinance and this guidance.

Establishing a List of Qualified Consultants: The community could provide a list of qualified consultants who have experience in the area to developers and land owners. Another strategy for ensuring that qualified consultants are used could include developing qualification criteria for authors of habitat assessments and mitigation plans; see the box to the right for an example of one community's criteria.

Public Comment Period: After habitat assessments and mitigation plans are submitted, the permitting official may require a public comment period before assessment conclusions and/or mitigation plans are approved. This approach could include a requirement that a public notice be posted in a publication of record. The intent of the public comment period would be to ensure that interested third parties would have ample opportunity to review and comment on proposed projects. This could alert the local permit official to issues or impacts not adequately addressed by an assessment or mitigation plan.

Third Party Review: The community may establish a system of third party review(s) by qualified consultants or agencies. Third party review is frequently implemented by local jurisdictions in the Puget Sound region for other environmental permits and approvals. The cost of third party review could be passed on to the applicant. This may require establishment of a third party review system in the local ordinance.

Establishing a system of third party review could augment internal review within the local jurisdiction. Another option that may work for certain jurisdictions could be formalizing a system of internal review where qualified staff would determine the adequacy of submittal materials.

3.1 Review Checklists

Permit staff could develop a review checklist for assessment and mitigation plan submittals. A checklist would likely need to be tailored to specific types of development activity due to the site- and habitat- specific nature of habitat assessments and mitigation plans. See the worksheet attached to this guidance document for an example of a review checklist.

Example Qualification Criteria

The following criteria could be used by a community as part (likely not all) of the minimal criteria needed to conduct habitat assessment to ensure assessments and mitigation plans are prepared by a qualified consultant:

Reports and plans shall be prepared by persons who have a minimum of a bachelor's degree in wildlife or fisheries habitat biology, or a related degree in a biological field from an accredited college or university with a minimum of four years' experience as a practicing fish or wildlife habitat biologist.

Qualifying criteria should include further specifications for all wildlife, fisheries, habitat, and environmental professionals that could be relied upon to address the broad array of habitats and conditions that occur in flood-prone areas.

4.0 References and Resources

4.1 Federal and State Regulations and Guidance

Checklist for the 2008 NMFS Biological Opinion for the NFIP in Puget Sound - National Flood Insurance Program and the Endangered Species Act, FEMA Region 10. http://www.fema.gov/nfip-and-endangered-species-act

Compliance Options for the 2008 NMFS Biological Opinion for the NFIP in Puget Sound - National Flood Insurance Program and the Endangered Species Act, FEMA Region 10. http://www.fema.gov/nfip-and-endangered-species-act

CRS Credit for Habitat Protection, FEMA, 2010. http://training.fema.gov/EMIWeb/CRS/

Endangered Species Consultation Handbook, National Marine Fisheries Service, 1998. http://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf

Endangered Species Act Section 7 Consultation, Final Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation – Implementation of the National Flood Insurance Program in the State of Washington Phase One Document, Puget Sound Region, National Marine Fisheries Service, September 22, 2008.

Frequently Asked Questions Regarding Implementation of the 2008 NMFS Biological Opinion for the NFIP in Puget Sound. National Flood Insurance Program and the Endangered Species Act, FEMA Region 10. http://www.fema.gov/nfip-and-endangered-species-act

Mitigation guidance and JARPA permit information, Army Corps of Engineers, Seattle District. http://www.nws.usace.army.mil/PublicMenu/Menu.cfm?sitename=REG&pagename=Forms

Mitigation guidance and JPA permit information, Oregon State Department of Lands. http://www.oregon.gov/DSL/WW/Pages/Permits.aspx

Model Ordinance for the 2008 NMFS Biological Opinion for the NFIP in Puget Sound. - National Flood Insurance Program and the Endangered Species Act, FEMA Region 10. http://www.fema.gov/nfip-and-endangered-species-act

National Flood Insurance Program Floodplain Management Requirements A Study Guide & Desk Reference for Local Officials, FEMA 480, 2005. www.fema.gov/library/viewRecord.do?id=1443

Recommendations for the Contents of Biological Assessments and Biological Evaluations, National Marine Fisheries Service. http://sero.nmfs.noaa.gov/pr/pdf/BA_guide_comboeh081105.pdf

4.2 Maps and Databases

Critical habitat maps:

- National Marine Fisheries Service: http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm
- U.S. Fish and Wildlife Service: http://criticalhabitat.fws.gov/

Forest Water Typing System, Washington Department of Natural Resources. www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx

Forest Water Typing System, Oregon State Water Resources Department. http://www.oregon.gov/ODF/Documents/WorkingForests/WaterClassificationTechNote1.pdf

A Framework for Delineating Channel Migration Zones. Washington State Department of Ecology and Washington State Department of Transportation, Ecology Publication # 03-06-027, 2003. http://www.ecy.wa.gov/biblio/0306027.html

National Wetland Inventory maps for the Puget Sound Region, U.S. Fish and Wildlife Service. http://www.fws.gov/wetlands/

Priority Habitats and Species (PHS) Database, Washington Department of Fish and Wildlife. http://wdfw.wa.gov/hab/phslist.htm

Threatened and Endangered Species List, Oregon Department of fish and Wildlife. http://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_candidate_list.asp

Washington Natural Heritage Database, Washington Department of Natural Resources. http://www.dnr.wa.gov/natural-heritage-program

Oregon Natural Heritage Program, Oregon State University Institute for Natural Resources. http://inr.oregonstate.edu/orbic

Washington and Oregon State Soil Survey data, see the USDA Natural Resource Conservation Service maps or online *Web Soil Survey*. http://websoilsurvey.nrcs.usda.gov/app/

Regional Guidance for Hydrologic and Hydraulic Studies in Support of the Model Ordinance for Floodplain Management under the National Flood Insurance Program and the Endangered Species Act, FEMA Region 10, 2010. www.fema.gov/about/regions/regionx/NFIP_ESA/hydrologicandhydraulicstudies.pdf

4.3 Water Quality and Quantity

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