Program Level Biological Assessment

for the

National Floodplain Insurance Program

Oregon State

February 2013

U.S. Department of Homeland Security
FEMA Region X
130 228th Street SW
Bothell, WA 98021

Program Level Biological Assessment

for the

National Floodplain Insurance Program

Oregon State

Prepared for:

U.S. Department of Homeland Security
FEMA Region X
130 228th Street SW
Bothell, WA 98021
Contact: Mark Eberlein (425) 487-4735; mark.eberlein@fema.dhs.gov

Prepared by:

AECOM
710 Second Avenue, Suite 1000
Seattle, WA 98104

July 2011

CONTENTS

Appendices

Tables

Figures

Acronyms and Abbreviations

ANWS	Association of Northwest Steelheaders
BA	Biological Assessment
BAS	Best Available Science
BCEGS	Building Code Effectiveness Grading Schedule
BFE	Base Flood Elevation
BMP	Best Management Practice
CAC	Community Assistance Contact
CAP-SSSE	Community Assistance Program – State Support Services Element
CAV	Community Assistance Visit
CBMC	Coos Bay Municipal Code
CFR	Code of Federal Regulations
CLOMA	Conditional LOMA
CLOMC	Conditional Letter of Map Change
CLOMR	Conditional LOMR
CLOMR-F	Conditional LOMR-F
cm	centimeter
CRS	Community Rating System
CTP	Cooperating Technical Partner
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DEQ	Oregon Department of Environmental Quality
DLCD	Oregon Department of Land Conservation and Development
DPS	Distinct Population Segment
DSL	Oregon Department of State Lands
EA	Environmental Assessment
EC	Eugene Code
Ecology	Washington State Department of Ecology
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESEE	economic, social, environmental, and energy
ESU	Evolutionarily Significant Unit
FEMA	Federal Emergency Management Agency
FHBM	Flood Hazard Boundary Map
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FISRWG	Federal Interagency Stream Restoration Working Group
FMA	Flood Mitigation Assistance
FMC	Fairview Municipal Code
FR	Federal Register
FY	Fiscal Year

GIS	Geographic Information System
HCP	Habitat Conservation Plan
HMA	Hazard Mitigation Assistance
HUD	U.S. Department of Housing and Urban Development
I-84	Interstate 84
JPA	Joint Permit Application
kg	kilogram
LC	Lane Code
LCDC	Land Conservation and Development Commission
LCFRB	Lower Columbia Fish Recovery Board
LID	Low Impact Development
LOMA	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
LOMR-F	Letter of Map Revision based on Fill
Metro	Portland Metropolitan Regional Government
mg/L	milligrams per litre
MRCI	Municipal, Residential, Commercial, and Industrial
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NAVD	North American Vertical Datum
NEDC	Northwest Environmental Defense Center
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
NOAA Fisheries	National Oceanic and Atmospheric Association, National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NWF	National Wildlife Federation
OAR	Oregon Administrative Rules
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
OHWL	ordinary high water line
OPRD	Oregon Parks and Recreation Department
ORS	Oregon Revised Statutes
OWEB	Oregon Watershed Enhancement Board
PLBA	Program Level Biological Assessment
PCE	Primary Constituent Element
PEER	Public Employees for Environmental Responsibility
PFMC	Pacific Fishery Management Council
PL	Public Law
PM	Procedure Memorandum
PMR	Physical Map Revision
RBZ	Riparian Buffer Zone

RIP	Rehabilitation and Inspection Program
Risk MAP	Risk Mapping, Assessments, and Planning
RPA	Reasonable and Prudent Alternative
SEC	Sensitive Environmental Concern
SFHA	Special Flood Hazard Area
TMDL	Total Maximum Daily Load
TVA	Tennessee Valley Authority
U.S.C.	United States Code
UGB	Urban Growth Boundary
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USWRC	U.S. Water Resources Council
WQC	Water Quality Certification

1.0 Introduction

The U.S. Congress established the National Flood Insurance Program (NFIP) with the passage of the National Flood Insurance Act of 1968. The NFIP is a federal program allowing participating communities to enable property owners to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages. The NFIP is administered by the Federal Emergency Management Agency (FEMA).

The original program was voluntary, and few communities participated until passage of the Flood Disaster Protection Act of 1973. This Act contained two key provisions that were critical to the future growth of the NFIP. The first prohibited federal agencies from providing financial assistance for the acquisition or construction of buildings in the designated floodplains of non-participating communities. Federal assistance initially included loans from federally insured or regulated lenders. Although the NFIP remained a voluntary program, the prohibition on federal financial assistance was a powerful negative incentive, and most joined the NFIP over the next few years (around 15,000 communities joined within the first 4 years after 1973). The second key provision required NFIP flood insurance as a condition of receiving federal financial assistance in designated flood hazard areas of participating communities. This is referred to as the mandatory flood insurance purchase requirement and resulted in rapid growth in flood insurance policies from around 300,000 policies at the end of 1973 to approximately 5.6 million by the end of 2010. Currently, 21,385 communities participate in the NFIP.

Participation in the NFIP is based upon an agreement between communities and the federal government. If a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains, the federal government will make flood insurance available within the community as a financial protection against flood losses. This insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods.

A recent court case on the NFIP in Washington State prompted discussion between FEMA and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS, also known as NOAA Fisheries), the federal agency that oversees salmon and steelhead listed under the Endangered Species Act of 1973 (ESA). In the court case (U.S. District Court, Western District of Washington, Seattle, Order No. C03-2824Z), the National Wildlife Federation (NWF) and Public Employees for Environmental Responsibility (PEER) asserted that FEMA was not in compliance with consultation requirements of the ESA because of potential effects on floodplain habitat and listed fish from implementation of the NFIP. At the direction of the court, FEMA initiated consultation with NMFS regarding the effects of the NFIP on listed salmon and steelhead in Washington. FEMA prepared a Programmatic Biological Assessment (PBA) on the NFIP in Washington (EDAW 2006) and submitted it to NMFS in February 2006

for their review under Section 7 of the ESA. In September 2008, NMFS issued a Biological Opinion (NMFS 2008c) determining that implementing the NFIP causes jeopardy to several species of Puget Sound salmon and orca whales as well as adverse modification of their habitat. In the Biological Opinion, NMFS provided a Reasonable and Prudent Alternative to modify implementation of the NFIP in a manner that would remove the jeopardy situation. FEMA has since produced and is executing an implementation plan to comply with the Biological Opinion for communities in Puget Sound.

On June 25, 2009, the Audubon Society of Portland, NWF, Northwest Environmental Defense Center (NEDC), and Association of Northwest Steelheaders (ANWS) (the Plaintiffs) filed an ESA lawsuit against FEMA with the U.S. District Court, District of Oregon (Case 3:09-cv_00729-HA) alleging that FEMA violated Section 7 of the ESA by not consulting with NMFS regarding the potential effects of the NFIP on Oregon salmon and steelhead listed as threatened and endangered under the ESA in Oregon. The lawsuit further asserted that FEMA failed to use its authorities to carry out programs to conserve listed species. On July 9, 2010, FEMA entered into an agreement with the Plaintiffs settling the lawsuit (U.S. District Court Case 3:09-cv-00729-HA: Settlement Agreement and [Proposed] Court Order). The Settlement Agreement requires FEMA to initiate formal consultation with NMFS on FEMA's implementation of the NFIP, the mapping of floodplains and revisions thereof, and the implementation of the Community Rating System (CRS) for the 15 salmon and steelhead listed under the ESA in Oregon. FEMA's request to initiate formal consultation with NMFS includes the preparation of a Program Level Biological Assessment (PLBA), this document.

1.1 PURPOSE

FEMA has prepared this PLBA pursuant to Section 7 of the ESA for the purpose of determining what effects, if any, the NFIP has on threatened or endangered salmon, steelhead, and their habitat throughout Oregon. Two other species under NMFS jurisdiction, eulachon and green sturgeon, are also addressed in this document as they are listed species that potentially could be affected by NFIP changes.

For the purposes of this evaluation, floodplains are the area designated on FEMA's flood maps, referred to as Flood Insurance Rate Maps (FIRMs), as the Special Flood Hazard Area (SFHA). The SFHA is defined as that land within a community subject to a 1 percent or greater chance of flooding in any given year. It is also referred to as the 100-year floodplain. The 1 percent chance flood represents the magnitude and frequency with a statistical probability of being equaled or exceeded once every 100 years.

1.2 ENDANGERED SPECIES ACT CONSULTATION

All federal agencies are required to consult with NMFS and the U.S. Fish and Wildlife Service (USFWS) in accordance with Section 7(a)(2) of the ESA regarding potential effects on federally listed or proposed species. (Collectively, NMFS and the USFWS are referred to as the Services.) The federal agency that is initiating or funding the "action" in question must ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of a federally listed threatened or endangered species, or a species proposed to be listed, or result in the destruction or adverse modification of designated or proposed critical habitat. For FEMA, the "action" evaluated in this PLBA is implementation of the proposed changes to the continuation of the NFIP program in Oregon state. This PLBA covers listed salmon, steelhead, eulachon, and green sturgeon throughout the state.

1.3 PROGRAMMATIC SCOPE

In the case of the NFIP, this PLBA analyzes the potential effects of an ongoing state-wide program in a range of counties and cities. The NFIP is complex and interrelated to a number of federal, state, and local floodplain programs. Thus, analyzing site-specific effects of such a complex program is not practical. Rather, the program is analyzed on a broad scale that takes into account those portions of the program that are applicable to floodplain development, effects on listed fish, and the level of FEMA discretion in program implementation. This PLBA includes the following chapters:

Chapter 2, *Proposed Action: Current Program and Proposed Changes*, provides an overview of the NFIP, the primary elements of the program, and a discussion of the NFIP in Oregon state. This chapter also describes the changes FEMA proposes to implement to the NFIP in Oregon utilizing knowledge gained from the implementation effort of the NMFS' Biological Opinion on the NFIP in Washington (NMFS 2008c). Finally, Chapter 2 describes the implementation schedule for the NFIP changes, and provides a narrative of the Action Area, or the geographic region covered by the analysis.

Chapter 3, *Existing Conditions*, describes the biological and physical setting of watersheds within several example communities selected for analysis in this PLBA. This chapter includes:

- A description of the distribution and biology of listed salmon, steelhead, green sturgeon, and eulachon in Oregon; overall habitat conditions and limiting factors by major watershed groups; and information on water quality.
- A description of how the example communities were selected and a map showing their location, and a description of NFIP activities, repetitive loss, general watershed conditions, and listed species and habitat conditions within each example NFIP community.

Chapter 4, *Analysis of Effects,* reviews the direct, indirect, interrelated and interdependent, and cumulative effects of the NFIP in Oregon state on the listed salmon, steelhead, eulachon, and green sturgeon species stated above. This chapter includes:

- A description of the analytical methods.
- The assumptions used in the analysis.
- A description of indirect effects of the NFIP in Oregon.
- A description of interdependent and interrelated effects of the NFIP in Oregon.
- A description of the cumulative effects of the NFIP in Oregon.

Chapter 5, *Essential Fish Habitat,* describes the environmental setting and the potential programmatic effects regarding Essential Fish Habitat (EFH), as required under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (Public Law [PL] 104-267). This analysis includes anadromous fish, ground fish, and coastal pelagic fish in Oregon waters.

2.0 Proposed Action: Current Program and Proposed Changes

2.1 OVERVIEW OF THE NFIP

The Proposed Action for this BA includes two elements: (1) the aspects of NFIP implementation in Oregon that will remain unchanged, and (2) aspects of the NFIP implementation in Oregon that will be revised. Sections 2.1 – 2.3 provide an overview of the current program in Oregon and its intersection with federal and state regulations, Section 2.4 provides an overview of the elements of the NFIP that were changed in Washington due to consultation with NMFS and were considered for inclusion to the Oregon NFIP changes, and Section 2.4 provides a summary of the changes that will be made to NFIP implementation in Oregon.

This chapter provides an overview of the NFIP and its implementation, including a description of other federal, state, and local programs affecting development in floodplains. Since its original establishment in 1968, the NFIP has been modified through a number of important amendments. These amendments have generally expanded the breadth of the NFIP. The effects of these amendments on the NFIP are summarized in Section 2.1.1. Although the development of the NFIP over the last 40 years functions as useful background information, determining the impacts of the program on fish species depends on its implementation. Therefore, Section 2.1.2 provides a general synopsis of the NFIP and its implementation. Section 2.2 provides a more detailed description of discretionary and non-discretionary elements of the NFIP. Section 2.3 presents information related to the implementation of the NFIP specifically in Oregon and a discussion of related state, federal, and local programs affecting floodplain development. Section 2.4 describes the recent implementation effort of the NFIP in Washington based upon the Biological Opinion's Reasonable and Prudent Alternative. Section 2.5 describes the additional activities that FEMA proposes to implement in Oregon.

2.1.1 GENERAL STRUCTURE

In 1968, the United States Congress passed, and the president signed into law, the National Flood Insurance Act (42 United States Code [U.S.C.] 4001 et seq.), which created the NFIP. The primary purposes of the 1968 Act creating the NFIP were to:

- Better indemnify individuals for flood losses through insurance.
- Reduce future flood damages through state and community floodplain management regulations.
- Reduce federal expenditures for disaster assistance and flood control.

To achieve these goals, the 1968 Act mandated a number of elements. Most importantly, Section 1315 of the Act required that communities adopt and enforce floodplain management regulations

that meet or exceed NFIP minimum criteria to be eligible for flood insurance from FEMA. Prior to the creation of the NFIP, floodplain management as a practice was not well established in communities and in a number of states. Section 1360 of the 1968 Act also required the mapping of the nation's floodplains to provide for more informed floodplain management decisions. Recognizing that existing development may not meet the NFIP minimum criteria, the Act established a system for categorizing and managing development constructed prior to and after the mapping of a community's floodplain. Developments undertaken prior to the publication of a map would not be required to comply with the NFIP minimum floodplain management criteria. All new development subsequent to the completion of maps defining the special flood hazard area, on the other hand, would be required to meet the minimum land-use and building code floodplain management criteria.

During the mapping process, FEMA designates Special Flood Hazard Areas (SFHAs) and identifies the degree of risk in those areas. The SFHA in each community is identified on a Flood Hazard Boundary Map (FHBM) or Flood Insurance Rate Map (FIRM) prepared by FEMA. The limits of the SFHA are based on the area inundated during the Base Flood (a flood having a 1 percent chance of being equaled or exceeded in any given year, also referred to as a 100-year flood). FEMA uses commonly accepted computer models that estimate hydrologic, hydraulic, and coastal conditions to determine the Base Flood Elevation (BFE).

The NFIP was broadened and modified with the passage of the Flood Disaster Protection Act of 1973 (42 U.S.C. 4002). This Act required property owners to purchase flood insurance as a condition of receiving any federal or federal-related financial assistance for the acquisition or improvement of land or structures in SFHAs. Federal officers or agencies are prohibited from approving financial assistance for acquisition or construction purposes in areas identified as having special flood hazards, unless the structure is covered by flood insurance (42 U.S.C. 4012a). This is referred to as the Mandatory Flood Insurance Purchase Requirement, which is not a FEMA action.[1]

Furthermore, Section 202(a) of the 1973 Act prohibited federal officers or agencies from approving any form of loan, grant, guarantee, insurance, payment, rebate, subsidy, disaster assistance loan, or grant for acquisition or construction purposes within the SFHAs of non-participating communities (42 U.S.C. 4106). For example, this would prohibit mortgage loans guaranteed by the Department of Veterans Affairs, insured by the Federal Housing Administration, or secured by the Rural Economic and Community Development Services unless the property was insured against flood damage outside the NFIP. In the case of disaster assistance under the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988,

[1] The Mandatory Flood Insurance Purchase Requirement applies to lenders under the jurisdiction of federal entities for lending institutions.

as amended, this prohibition only applies to assistance for buildings in the SFHA damaged by flooding.

The NFIP was further modified by the National Flood Insurance Reform Act of 1994, signed into law on September 24, 1994. This law provides tools to increase the effectiveness of the NFIP in achieving its goals of reducing the risk of flood damage and reducing federal expenditures for uninsured properties that are damaged by flood. The law includes provisions for increasing lender compliance, increasing flood insurance coverage limits, reducing repetitive losses, providing Increased Cost of Compliance coverage, and establishing a Flood Mitigation Assistance (FMA) program for mitigation projects and planning. The FMA program provides funding up to $20 million per year with a 75/25 cost share to accomplish flood mitigation planning and implement measures to reduce future flood damages to structures, such as acquiring structures or elevating flood damaged buildings.

In 1990, FEMA established the Community Rating System (CRS) as an incentive program to provide flood insurance premium reductions to communities that go beyond the minimum requirements of the NFIP. The CRS was codified in the 1994 Act. If communities take additional actions to reduce flood losses and promote awareness of flood insurance, insurance rates for property owners can be reduced through the CRS. Through CRS, communities can receive credit for activities such as:

- Protecting natural floodplain functions, such as providing flood storage, reducing erosion, improving water quality, and providing habitat for diverse species of flora and fauna.
- Advising people about flood hazards, ways to reduce flood damage, and the availability of flood insurance.
- Mapping additional flood hazard areas.
- Preserving open space.
- Enforcing higher regulatory requirements.
- Addressing repetitive losses through relocations of or retrofitting flood-prone structures.
- Maintaining drainage systems.

From its creation and through subsequent amendments, the NFIP has included a mix of direct mandates (providing little or no flexibility) and discretionary actions. Under the ESA Section 7(a)(2), federal agencies are required to consult only if there is discretionary federal involvement or control: "…where the federal agency lacks the discretion to influence the private action, consultation would be a meaningless exercise; the agency simply does not possess the ability to implement measures that inure to the benefit to the protected species" (50 Code of Federal Regulations [CFR] 402.03). Some elements of the NFIP do not provide FEMA with the necessary discretion to require consultation. Three discretionary components of the NFIP are addressed in this PLBA:

- Floodplain mapping.
- Minimum requirements of the NFIP.
- The Community Rating System.

2.1.2 NFIP IMPLEMENTATION

Participation in the NFIP is based on a voluntary agreement between participating (local, tribal and states) communities and the federal government. If a community adopts and enforces a floodplain management ordinance to reduce future flood risks within SFHAs, the federal government will make flood insurance available to property owners in that community as a financial protection against flood losses. Providing NFIP flood insurance better indemnifies property owners from flood losses and reduces the costs of disaster assistance. NFIP floodplain management requirements are designed to discourage development in SFHA, reduce future flood damages, like requiring new structures that are located in the SFHA be elevated to or above the BFE and, as a result, reduce disaster assistance costs and the need to build costly flood control projects. The NFIP is administered by the Federal Insurance and Mitigation Administration within FEMA. The Oregon Department of Land Conservation and Development (DLCD) is designated by the Governor as the state's coordinating agency for the NFIP.

Flood insurance coverage is available by statute to all owners and occupants of insurable property (a building and its contents) in a participating community. Almost every type of walled and roofed building that is principally above ground and not entirely over water may be insured. Flood insurance policies through the NFIP are available from many private insurance companies and independent agents. All companies offer identical coverage and rates as prescribed by the NFIP.

As of November 30, 2010, there were 33,121 NFIP policies in-force in the state, representing more than $7.2 billion in coverage. Policies are also available to individual units within those buildings. Thus, a contract for a multi-family building would include numerous individual policies. From January 1, 1978 through November 30, 2010, 4,779 claims totaling more than $83.3 million have been paid in the state.

Before property owners in a community can purchase flood insurance, the community must "participate" in the NFIP. A "community" is a governmental body with the statutory authority to enact and enforce zoning regulations, building codes, subdivision and other land use control measures. The authority of each unit of government varies by state. Eligible communities can include cities, villages, towns, townships, counties, parishes, states, and Indian tribes. When the community chooses to join the NFIP, it must adopt and enforce minimum floodplain management requirements and apply the criteria uniformly to all privately and publicly owned land within the designated SFHA. Additionally, communities are allowed and encouraged to adopt floodplain management criteria that are more restrictive than the NFIP minimum criteria.

Although some private flood insurance is available (particularly for commercial and industrial property), most flood insurance coverage is provided by the NFIP.

In Oregon, 260 communities participate in the NFIP, including nine for which no flood hazards have been identified (see Figure 2.1-1). Among the participating communities are three Indian tribes: the Umatilla, Warms Springs, and Burns Paiute. A list of all current NFIP participants in Oregon can be found in Appendix A.

FEMA conducts Flood Insurance Studies (FISs) for each community where flooding is perceived to be a risk and issues FIRMs that show the area subject to the 1 percent chance annual flood. These areas are shown on the FIRM as either V zones (V, VE, V1-30) or A zones (A, AE, A1-30, AO, AH, AR, AR1-30). V zones are high hazard zones in coastal areas that are subject to high velocity wave impacts. A zones include coastal floodplains that are less hazardous than V zones, floodplains along rivers and streams, and areas susceptible to other flooding sources. Mapping of flood hazards provides the data necessary to administer community floodplain management regulations, rate flood insurance policies, and implement the mandatory flood insurance purchase requirement and the prohibition on federal assistance.

The maps also increase awareness of the flood hazards and are used by states and communities for emergency management and by federal agencies in implementation of Executive Order 11988 Floodplain Management.

Floodplain management requirements apply to properties located in identified SFHAs that are mapped on a community's FHBM or FIRM. These requirements are designed to discourage development within the SFHA, prevent new development from increasing the flood threat and protect both newer (post-FIRM) and older (pre-FIRM) existing buildings from anticipated flood events. All new development within the floodplain must meet NFIP's minimum floodplain management criteria. It is the responsibility of the community to ensure that all new and substantially improved structures built in the SFHA meet the requirements of the local floodplain management ordinance. Methods and materials designed to minimize future flood damage must be used, while not increasing the flood risk to other existing development in the floodplain.

Existing pre-FIRM buildings must be brought into compliance with NFIP criteria only when the building is "substantially damaged" or "substantially improved," in which the cost to repair or the cost to improve the existing building equals or exceeds 50 percent of the structure's market value. In these cases, the NFIP's minimum floodplain management criteria require bringing the pre-FIRM building into compliance with the same requirements that apply to new construction in the SFHA. Similarly, when a community's BFE has increased upward, post-FIRM buildings that have been substantially damaged or are proposed for a substantial improvement must comply with construction requirements that reflect the new BFE.

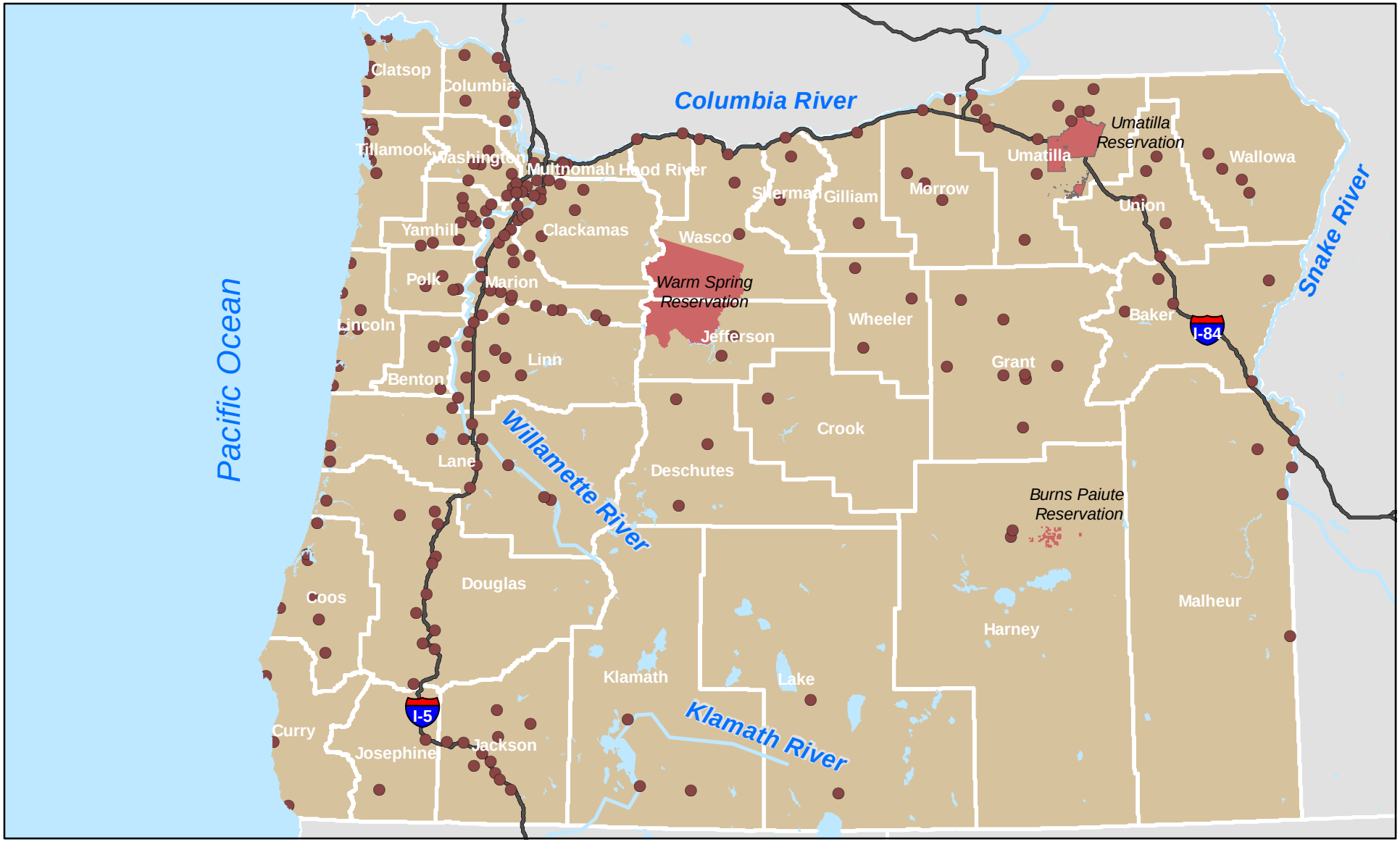


Figure 2.1-1. Counties and Cities enrolled in the NFIP in Oregon
Oregon NFIP Program Level Biological Assessment

- NFIP Insured City/Town/Place
- NFIP Insured Reservation
- Oregon Counties
- Surrounding States
- Interstate Highways
- Major Open Water/Ocean
- Major Rivers

Sources: FEMA NFIP
Community Status Book
October 10, 2010

Note: All Oregon counties are insured under the NFIP

File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure-2-2-1_NFIP_Communities_8x11.mxd

Print Date: July 11, 2011

FEMA has no authority to regulate floodplain development. The ultimate power to regulate development—including the provision and approval of permits, inspection of property, and citing violations—is granted to communities by the states. State and local governments, through their planning, zoning, and building code enabling authorities, make the determination of how a property must be developed.

2.2 DISCRETIONARY ELEMENTS OF THE NFIP

Under the NFIP, FEMA has some level of discretion in three particular areas and can exert direct control over program implementation:

- SFHA mapping.
- Minimum floodplain management criteria.
- The Community Rating System.

To effectively determine the impacts related to these three activities, and to identify appropriate mitigation measures to reduce those impacts, this section provides a detailed description of each element.

2.2.1 SPECIAL FLOOD HAZARD AREA MAPPING

The adoption of the 1 percent annual chance flood as the standard for the NFIP grew out of a number of historical events and review of appropriate standards for flood protection measures. The Tennessee Valley Authority (TVA) and the U.S. Army Corps of Engineers (USACE) began using a 100-year flood standard in the 1950s and 1960s, respectively. This standard was further reinforced in 1966 by Executive Order 11296 on Evaluation of Flood Hazard in Locating Federally Owned or Financed Buildings, Roads, and Other Facilities and Disposing of Federal Lands and Properties. The National Flood Insurance Act of 1968 that established the NFIP directed the U.S. Department of Housing and Urban Development (HUD) to establish floodplain management criteria and to designate flood hazard areas. The University of Chicago's Center for Urban Studies was contracted by HUD to conduct a seminar to make recommendations on these criteria. The report from this process recommended the use of the 100-year flood standard, and this was published by HUD's Federal Insurance Administration as a proposed rule on February 27, 1969. With its adoption and use by the NFIP, the 100-year flood standard became the de facto national standard for floodplain management. The standard was revisited by the U.S. Senate Committee of Banking, Housing, and Urban Affairs hearings on the Flood Disaster Protection Act of 1973 and again in 1981 as part of the Vice President's Task Force on Regulatory Relief. The 100-year flood standard was supported in both instances and no changes were made.

At the start of the NFIP, the intent was to map communities so that they could participate in the program. It was understood that communities needed to be mapped so that they could adopt and implement land use regulations, vital to their participation in the program. Courts have long ruled

that citizens have a right to understand what land use regulations apply to their property. They have also ruled the only way to fairly describe the lands that are subject to the regulation is for communities to publish a map associated with the regulations. Publishing a list of property descriptions simply is not adequate due public notice.

Quickly, it became clear that the time it took to perform a detailed study for a community would delay the implementation of the program in many flood-prone communities. As a result, an interim process was implemented where Flood Hazard Boundary Maps (FHBMs), which delineated the boundaries of the community's SFHAs, were prepared using approximate methods. These methods identified on an approximate basis a 1-percent-annual-chance floodplain, but did not include the determination of BFEs (1-percent-annual-chance flood elevations), flood depths, or regulatory floodways. (A regulatory floodway is the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water-surface elevation more than a designated height.) The FHBM was intended to assist communities in managing floodplain development, and to assist insurance agents and property owners in identifying those areas where the purchase of flood insurance was advisable; they were an interim product until the Flood Insurance Study (FIS) was completed and a FIRM developed.

FISs that use detailed hydrologic and hydraulic analyses to develop BFEs, designate floodways and risk zones of the floodplain were subsequently produced for most NFIP communities. In updating of FISs and FIRMs, a combination of two study approaches (approximate and detailed) is used to identify flood hazards within a community. Detailed study methods typically employ the use of engineering models and, at a minimum, result in the determination of SFHAs and BFEs or flood depths to display on the FIRM. The approximate approach uses resources such as topographic maps, aerial photographs, any available flood information, and rudimentary hydrologic and hydraulic analyses. This type of analysis allows FEMA to determine the general boundaries of the SFHA but is not sufficiently rigorous to determine BFEs and a floodway.

The decision whether to use the approximate or detailed method is generally based on existing and anticipated development in and near the floodplain. However, other considerations need to be taken into account, such as available funding (both from FEMA and the local community) to perform the flood study. Flood hazard information for flooding sources that affect developed or developing areas is based on detailed studies whenever possible; approximate study methods, which are less rigorous than the detailed methods and do not determine BFEs or floodways, may be used for undeveloped or sparsely developed areas.

The main components of any study used to develop flood hazard data for the NFIP are topographic data, survey methodology, and flood hazard identification techniques (modeling and mapping). A detailed study is one in which flood elevations and a flood profile are published.

This will require local floodplain administrators to adopt those flood elevations in their local floodplain management ordinances, thereby restricting them to the use of those elevations, or higher if better data are available. A detailed study that designates floodways on riverine floodplains requires additional floodplain management requirements. The development of a floodway does not have any impact on insurance rates or purchase requirements. For areas designated by approximate methods, BFEs have not been developed in these areas. The local community must obtain and reasonably utilize BFEs from federal, state, or other sources to require the elevation or flood-proofing of structures. If no BFEs are available from these sources, the community should use local knowledge of flooding and other information in the area to administer their floodplain management ordinance. Developers are required to provide base flood elevations for subdivisions and other development above an established threshold for these areas.

After completing the analyses of the flood hazards for a community, an FIS report can be compiled and flood hazard data can be reflected on the FIRM, which functions as the basis for insurance rate-setting by FEMA. FIRMs are also used by lenders in implementing the mandatory flood insurance purchase requirement, by insurance agents to write flood insurance policies, by federal agencies in implementing Executive Order 11988 and other environmental requirements, and by all levels of government for emergency planning and management. The FIS report gives a narrative of the flood hazards as well as the flood profiles and floodway data, while the FIRM reflects the graphical representation of the flood risk within a community. As stated previously, the level of flood risk varies within the community so approximate and detailed analytical methods are labeled differently throughout. Table 2-1 summarizes the SFHAs subject to inundation by the 1-percent-annual chance flood and how the zone designations label correlates directly to the level of study that has been performed in that area.

Table 2-1. Special Flood Hazard Area Designations.

Zone Designation	Definition	Type of Analysis
A	SFHA with no BFEs or floodway determined	Approximate
AE	SFHA with BFEs determined and in some cases floodway determined	Detailed
A1-A30	SFHA with BFEs determined and in some cases floodway determined (old format, not used on newer FIRMs)	Detailed
AH	SFHA with flood depths of 1 to 3 ft (usually areas of ponding); BFEs determined	Detailed
AO	SFHA with flood depths of 1 to 3 ft (usually sheetflow on sloping terrain or ponding); average depths determined	Detailed
V	Coastal flood zone with no BFE determined	Approximate
VE	Coastal flood zone with velocity hazard (wave action); BFE determined	Detailed
V1-V30	Coastal flood zone with velocity hazard (wave action); BFE determined (old format, not used on newer FIRMs)	Detailed

Processes for Reflecting Changes to the Flood Maps

The flood risk information presented on the FIRM and in the FIS report forms the technical basis for the administration of the NFIP. FEMA exercises great care to ensure that the analytical methods employed in the FISs are scientifically and technically correct, that the engineering standards followed meet professional standards, and ultimately, that the results of the FIS are accurate. Although the NFIP maps and FIS reports are prepared according to specific technical standards, FEMA recognizes that changes to the maps and reports may be necessary. The reasons for these changes are due to the availability of more or new technical data, changes in the physical conditions either natural or man-made within the floodplain or watershed, and improvements in the techniques used in assessing flood risk. Changes to the maps or FIS can be initiated by either the community or FEMA. Areas with BFE's have a 26 percent chance of flooding over the life of a 30-year mortgage. BFEs derived from detailed analyses are shown at selected intervals within these zones.

FEMA can revise maps by conducting a new or revised FIS or through a Physical Map Revision (PMR) or a Letter of Map Change (LOMC). Development of a new or revised FIS is described in the previous section. A PMR involves the revision of a full FIRM panel that will then be reprinted and published with a new effective date. Changes to the SFHA that do not include a revision of the entire FIRM panel include several types of LOMCs: Letter of Map Revision (LOMR), Letter of Map Revision based on Fill (LOMR-F), and conditional letters of each of these categories. Depending on the exact situation or cause of revision, FEMA may issue either a particular LOMC type or PMR to reflect or note the change to the current effective FIRM. Letters of Map Amendment (LOMA) are a clarification based on better or more detailed topographic data that a building is within or outside of a SFHA, but do not revise or amend the map.

Although FEMA uses the most accurate information available, limitations of scale or topographic definition of the source maps used to prepare the FIRM may cause small areas that are at or above the flood elevation to be inadvertently shown within the SFHA boundaries. Also, the placement of fill may elevate small areas within the SFHA boundaries to an elevation at or above the flood elevation.

The LOMA process corrects inadvertent inclusions and results from an administrative procedure that involves the review of technical data submitted by the owner or lessee of property who believes the property has incorrectly been included in a designated SFHA. A LOMA clarifies the current effective FEMA map and establishes that a specific property is (or is not) located in an SFHA, and may remove the Mandatory Flood Insurance Purchase Requirement. A LOMA merely provides a greater level of accuracy than the current mapped SFHA can provide. No physical change to the floodplain has occurred and no fill has been placed in the floodplain.

The LOMR process is an administrative process by which a community can submit technical data to revise the FIS and FIRM. The result is a letter from FEMA to the Chief Executive Officer of the community officially revising the current effective FIRM and FIS. Along with providing the community official a letter stating the changes to the floodplains, floodways, or flood elevations, FEMA provides revised portions of the FIRM and FIS. LOMRs are based on physical changes that have affected the SFHA, in contrast to LOMAs, which are a clarification of maps based on more precise data – not a change on the ground.

A LOMR-F is submitted for properties where fill has been placed to raise the structure or lot to or above the 1-percent-annual-chance flood elevation. NFIP regulations require that the lowest adjacent grade of the structure be at or above the 1-percent-annual-chance flood elevation for a LOMR-F to be issued, removing the structure from the SFHA. The participating community must also determine that the land and any existing or proposed structures to be removed from the SFHA are "reasonably safe from flooding." To remove the entire lot and structure, both the lowest point on the lot and the lowest adjacent grade of the structure must be at or above the 1-percent-annual-chance flood elevation. A LOMR-F is not required for all local land use decisions that result in fill in the SFHA; it is only required if the land owner wishes to have the affected area mapped as no longer in the SFHA, thus removing the requirement for flood insurance. Therefore, not all fill activities in participating communities require FEMA approval.

Because LOMRs and LOMR-Fs officially revise the flood maps, they must reflect existing conditions, such as an “as-built” project. There are instances where communities, developers, and property owners request FEMA to review and comment on proposed projects in floodplain areas. Such requests typically include data and analyses of the pre- and post-project conditions so that FEMA can ascertain the impact on flood hazards of the proposed project. For such requests, FEMA reviews the data and a response is provided in the form of a “Conditional” LOMC or CLOMC (i.e., CLOMR or CLOMR-F).

The concept of the CLOMR and CLOMR-F is advisory in nature and does not revise or amend the NFIP map. This is not a permit process; rather, it is a way to review project(s) for floodplain mapping purposes before a community or developer begins construction. When this process was originally developed, the intent was to ensure that FEMA’s constituents (including states and communities) were aware of the impact that the development within the SFHA would have on mapped flood hazard and associated flood risk.

The final response from FEMA will state whether the proposed project, if built as proposed, would meet the minimum floodplain management criteria of the NFIP and, if so, what revisions would be made to the community’s NFIP maps. The conditional letter is essentially FEMA’s comment on a proposed project and does not result in any map changes, nor does it constitute a building permit or other land use approval. However, the CLOMC does provide some assurance

regarding whether a LOMC would be issued, provided a project is constructed in accordance with the proposal submitted for review. A CLOMR is only required when someone proposes an encroachment in the SFHA or SFHA and floodway that results in increases in BFEs of a certain amount based on the local floodplain regulations or to change the floodway.

The CLOMC review process provides FEMA with an opportunity to identify any potential effects on threatened or endangered species prior to any construction or physical change in the floodplain. FEMA Procedure Memorandum 64 (FEMA 2010b) summarizes FEMA's process for reviewing CLOMCs for compliance with the ESA.

The CLOMR-F or CLOMR request will be processed by FEMA only after receiving documentation from the requestor that demonstrates compliance with the ESA. The requestor must demonstrate ESA compliance by submitting to FEMA either an Incidental Take Permit, Incidental Take Statement, "not likely to adversely affect" determination from the Services, or an official letter from the Services concurring that the project has "No Effect" on listed species or critical habitat. FEMA Region X will provide technical assistance to applicants for projects with the potential to adversely affect listed species or critical habitat. If the project is likely to cause jeopardy to listed species or adverse modification of critical habitat, then FEMA shall deny the CLOMC request.

LOMC requests involving floodplain activities that have already occurred do not provide the same opportunity as CLOMCs for FEMA to comment on the project because map changes are issued only after the physical action has been undertaken. In these instances, private individuals and local and state jurisdictions are required to comply with the ESA independently of FEMA's process. Table 2-2 summarizes FEMA's ESA requirements.
The NFIP regulations direct FEMA to revise and amend maps and FIS reports, as warranted, or after it receives requests from community officials and individual property owners. To help FEMA ensure that the maps and reports present information that accurately reflects existing flood risks, the NFIP regulations require that each NFIP community inform FEMA of any physical changes that affect BFEs in the community and, within 6 months of the date that such data are available, submit those data showing the effects of the changes.

Over the lifetime of the program, numerous map changes have been processed. Table 2-3 summarizes the total number of map changes processed in Oregon since 1990, when many of the salmon and steelhead Evolutionarily Significant Units (ESUs) were listed. By far, LOMAs have been the most common change, with almost 3,500 issued since 1990. The next most common group, LOMR-Fs, totaled 408. Details on historical NFIP data are provided in Chapter 4.

Table 2-2. FEMA ESA Requirements for LOMCs and CLOMCs.

Request	ESA-related Action	ESA Requirement Related to FEMA Process
CLOMC Requests		
CLOMA	No physical modification to floodplain is proposed.	No physical alteration is anticipated; thus no ESA compliance required.
CLOMR-F	Proposed placement of fill in the floodplain.	ESA compliance must be documented to FEMA prior to issuance of CLOMR-F. FEMA must receive confirmation of ESA compliance from the Services.
CLOMR	Proposed modifications of floodplains, floodways, or flood elevations based on physical and/or structural changes.	ESA compliance must be documented to FEMA prior to issuance of CLOMR. FEMA must receive confirmation of ESA compliance from the Services.
LOMC Requests		
LOMA	No physical modification to floodplain has occurred.	No ESA compliance is required. Based upon Best Available Science.
LOMR-F	Placement of fill in floodplain has occurred.	ESA compliance is required independently of FEMA's process. The community needs to ensure that permits are obtained per requirement under Section 60.3(a)(2) of FEMA's regulations.
LOMR	Modifications of floodplains, floodways, or flood elevations have occurred based on physical and/or structural changes.	ESA compliance is required independently of FEMA's process. The community needs to ensure that permits are obtained per requirements under Section 60.3(a)(2) of FEMA's regulations.

Source: FEMA Procedure Memorandum 64 (FEMA 2010b).

Table 2-3. LOMCs in Oregon since 1990.

	LOMC Type					
	CLOMAs	**LOMAs**	**CLOMRs**	**LOMRs**	**CLOMR-Fs**	**LOMR-Fs**
Number Issued	11	3,491	55	287	55	408

Map Modernization Program and Risk Mapping, Assessment, and Planning (Risk MAP)

The processes described above provide a means for making discrete changes to individual maps, based on physical changes or new information. However, FEMA recognized a number of significant limitations in its mapping program as a whole. To address these issues, FEMA conducted a Flood Map Modernization program from 2004 through 2009 to digitize, improve, and update flood maps throughout the nation. Prior to this effort, flood maps were produced using traditional paper mapmaking methods. Many maps were outdated as well. According to DLCD, more than 70 percent of Oregon NFIP communities had outdated flood maps. Map modernization used digital technology to provide a more cost-effective, long-term approach for updating, maintaining, storing, and distributing map data. The program:

- Produced digital map panels to replace existing paper maps and to provide updated flood risk information.
- Created new map panels for previously unmapped communities.

- Integrated communities, states, and regional agencies into the mapping process through the Cooperating Technical Partners (CTP) initiative—several Oregon communities, as well as the State of Oregon, participate in this initiative.
- Converted all mapping projects to the North American Vertical Datum (NAVD) of 1988.
- Converted maps to a paneling scheme that mirrored U.S. Geological Survey (USGS) Quadrangles.
- Improved customer service to make the maps easier to obtain and use, including electronic and digital printing and distribution.

Building on the success of the Map Modernization Program, FEMA began in 2009 a transition to a new program: Risk Mapping, Assessment, and Planning (Risk MAP) (FEMA 2010g). The purpose of Risk MAP is to improve flood hazard information for the NFIP through the integration of flood hazard mapping, risk assessment tools, and mitigation planning. A powerful, web-based data analysis tool will be employed to quantify flood risk, facilitate mitigation planning, and measure flood risk reduction. Five goals have been identified for Risk MAP:

1. Address gaps in flood hazard data.
2. Decrease flood hazard vulnerability through increasing public awareness of flood risks.
3. Lead and support state, local, and tribal communities to effectively engage in risk-based mitigation planning.
4. Provide an enhanced digital platform for the management and sharing of risk data.
5. Align risk analysis programs and enhance decision-making.

As the Map Modernization Program concludes and the new program – Risk Mapping, Assessments, and Planning (Risk MAP) – launches, FEMA Region X seeks to work with federal, tribal, state, and local stakeholders to identify and assess risk aspects pertaining to multi-natural hazards to develop products that effectively communicate these risks in a non-regulatory manner. An example of this is to include channel migration zones in the risk database accompanying the digital FIRM dataset. Additionally, Risk MAP opens up opportunities to partner with other federal agencies, tribal governments, state agencies, and local jurisdictions to develop data, products, and outreach strategies that cross disciplines and meet the objectives of multiple programs.

FEMA Region X prioritizes development of FISs based on the following factors: assessment of risk, evaluation of the need to update data, available terrain data, and local contribution of data. As a result of congressional appropriations, FEMA Headquarters establishes targets in different study types that affect how Region X identifies fiscal year procurement objectives. For example, categories for study production in the past reflected the following: coastal, levee, other engineering needs, and potential partnerships with established Cooperating Technical Partners through our grant program. As part of the risk assessment input, variables relating to insurance

claims, policies, losses, and disasters are included as well. Region X also includes geographic information system (GIS) data pertaining to the listed endangered species and habitat, as well as input from the states regarding factors such as climate change, floodplain development pressure, growth, land use changes, and areas without digitized FIRMs. National guidance places a strong emphasis on coastal work and prioritization of riverine areas based on assessment of risk (45 percent), evaluation of need to update data (45 percent), and available terrain data (10 percent).

Level of Study Performed During the FIS

The level of study performed on a particular flooding source is discretionary because the level of detail on a given flooding source is directly related to the available funding and the flood risk associated with an area. In areas with greater flood risk due to development, the intent is for FEMA to apply more funding to that study and ensure that BFEs and, in many cases, a floodway can be determined for the area. The Guidelines and Specifications for Flood Hazard Mapping Partners (Guides and Specs) (FEMA 2003), "Guidance for Riverine Flood Analyses and Mapping," state that the FEMA lead and other members of the Flood Map Project Management Team will decide which flooding source(s) within the community will be studied using detailed hydraulic analyses. Also, the Guides and Specs state that the Mapping Partner performing the hydraulic analysis shall determine flood elevations for the 10-, 2-, 1-, and 0.2-percent annual chance floods, unless otherwise instructed by the FEMA lead.

In addition to the development of BFEs, the community has discretion to establish a regulatory floodway. As stated previously, the regulatory floodway represents the portion of the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water-surface elevations more than a designated height. Having a regulatory floodway requires the community to significantly limit encroachment and development within the floodway. For communities that have flood elevations, but where no floodway has been designated, the community must prohibit all new construction and substantial improvements within the entire SHFA unless it can be demonstrated that the cumulative effect of any proposed development, when combined with all other existing and anticipated development, will not increase the elevation of the base flood by more than 1 foot at any point within the community.

2.2.2 FLOODPLAIN MANAGEMENT CRITERIA

A second category of discretionary actions that may affect listed species in Oregon is the NFIP minimum floodplain criteria. As a part of the 1968 Act, Congress prohibited issuing flood insurance to property owners within a community that has not adopted and implemented at least the minimum floodplain management criteria established within the Act. If a local floodplain ordinance is not in place, or if that ordinance does not meet these established conditions, a community cannot be eligible for the NFIP. Similarly, if a community fails to maintain a floodplain ordinance or adopts an ordinance that does not meet established guidelines, that

community could be suspended from the program. A participating community in the NFIP must also require permits for all development in the SFHA, including, but not limited to, filling, grading, paving, and dredging. To assist local communities in the development of their floodplain management programs, Oregon DLCD provides a model floodplain ordinance as a baseline template (based on NFIP minimum requirements) (see Appendix B for the model ordinance).

FEMA ensures compliance with the established NFIP regulations by reviewing each community's adopted ordinance and maintaining a dialogue with the community. Through Community Assistance Visits (CAVs) and Community Assistance Contacts (CACs), FEMA, and DLCD on behalf of FEMA, oversees community activities and monitor implementation of the program. If, in reviewing a community's activities, FEMA identifies deficiencies or violations, FEMA has the option to place the community on formal probation. Initially, FEMA will notify the community of these issues and provide the community with time to rectify them. If, over time, the community is making adequate progress in addressing the issues, probation will not be applied. If the community does not address the issues, formal probation will be initiated (for a minimum of 1 year). During this time, new policies can be sold and existing policies renewed, but policyholders are surcharged a $50 fee on their premium. If during the probationary period the community does not address FEMA's concerns, the community can be suspended from the NFIP. During suspension, existing policies cannot be renewed and new policies cannot be sold. The possibility of losing insurance coverage creates an incentive for local communities under development pressure to adhere to FEMA's minimum eligibility requirements.

The applicable minimum criteria vary depending on the level of floodplain analysis performed within the community. For each additional level of detail provided in the FIS, additional minimum requirements for community floodplain management ordinances are established. 44 CFR 60.3 outlines the requirements associated with each level of flood hazard analysis. NFIP regulations contain specific elevation and structural performance requirements for all buildings constructed within the SFHA. NFIP minimum criteria establish different requirements for properties in A zones and V zones, but specific elevation and structural performance requirements are included for all buildings in the SFHA. These requirements form the foundation of floodplain management in a community. Many states and individual communities have adopted more restrictive regulations that go beyond NFIP minimum requirements. The State of Oregon has several more restrictive floodplain management requirements, as described in Section 2.3.2. Similarly, some individual Oregon communities have more restrictive requirements. Several individual communities are examined in more detail in Section 3.5.

2.2.3 COMMUNITY RATING SYSTEM

A final discretionary element in the NFIP that may affect listed salmon and steelhead species is the Community Rating System (CRS). Building upon the minimum eligibility requirements within the 1968 Act, FEMA established the CRS in 1990 and Congress codified it in 1994. Reductions in insurance premiums are based on the extent to which communities exceed the minimum requirements of the NFIP and on other activities they undertake to reduce flood damages. In general, the goals of the CRS are as follows:

- Reduce and avoid flood damage to insurable property,
- Strengthen and support the insurance aspects of the NFIP, and

Foster comprehensive floodplain management.

Goal 1. Reduce and avoid flood damage to insurable property.
The CRS supports the NFIP by working to minimize flood losses nationwide, both inside and outside of mapped floodplains. Communities are encouraged to reduce the exposure of existing buildings (and their contents) to flood damage, especially properties that are subject to repetitive flood losses. New buildings and their contents should be protected from known and future local flood hazards. Standards higher than those set out in the minimum criteria of the NFIP may be needed to accomplish these tasks. The CRS encourages communities to map and provide regulatory flood data for all their flood hazards. The data should be used in their regulatory programs and shared with all users and inquirers.

Goal 2. Strengthen and support the insurance aspects of the NFIP.
The CRS recognizes communities whose activities generate and contribute data that enable accurate actuarial rating of flood insurance. Communities are encouraged to implement mapping and information programs that help assess individual property risk and reduce repetitive flood losses. To help expand the policy base, communities should make their residents aware of their flood risk so that they purchase and maintain flood insurance policies.

Goal 3. Foster comprehensive floodplain management.
The CRS encourages communities to use all available tools to implement comprehensive local floodplain management programs, which ordinarily have concerns beyond the protection of insurable property. The CRS recognizes local efforts that protect lives; further public health, safety, and welfare; minimize damage and disruption to infrastructure and critical facilities; preserve and restore the natural functions and resources of floodplains and coastal areas; and ensure that new development does not cause adverse impacts elsewhere in the watershed or on other properties.

> A community's staff should understand the physical and biological processes that form and alter floodplains and watersheds and take steps to deal with flooding, erosion, habitat loss, water quality, and special flood-related hazards. A comprehensive approach includes planning, public information, regulations, financial support, open space protection, public works activities, emergency management, and other appropriate techniques.

Using a criteria-based scoring system described in the CRS Coordinator's Manual (FEMA 2013), FEMA ranks communities based on 19 creditable activities. All of the creditable activities fall within one of four general categories: Public Information, Mapping and Regulations, Flood Damage Reduction, and Warning and Response. Appendix C lists the various activities, along with their associated available credit, under each general category. Within each of the 19 activities, there are specific "Elements" for which communities can receive CRS credits (for more info on these Elements, see the Coordinator's Manual). In total, 34 Oregon communities participate in the CRS.

Generally, a more stringent regulatory framework related to floodproofing, preservation of open space, and protection of natural resources (and floodplain function) is rewarded with a higher score. Through an application process, local communities must demonstrate which criteria are currently being met and document exactly how. Data to support these conclusions must also be provided to FEMA. In reviewing applications, FEMA utilizes a five-step process to determine the number of credits given to a community:

- **Element Credit Points**—The determination of whether the community's program includes the Elements associated with a particular creditable activity.
- **Impact Adjustment**—For each Element, the effectiveness/size of the activity is determined to measure the expected impact/improvement (using impact ratios).
- **Credit Calculation**—Credit points are multiplied by impact ratios and summed to determine the amount of credit received for each activity.
- **Community Growth Adjustment**—A multiplier for the 400 series (see Table 2-4) activities is applied to reflect the community's growth rate (the higher the rate, the larger the multiplier).
- **Community Classification**—Points for all of the activities are totaled to determine the community's overall score.

The total points available are separated into ten different classes. All communities enrolled in the NFIP begin as a Class 10 community. As actions satisfying the criteria associated with the 19 creditable activities are demonstrated, the community moves into a new class. Class 1 represents the highest possible rating. The credits required to obtain the various classes and the resulting discounts on insurance premiums are summarized in Table 2-4, as well as how many participating Oregon communities are in each class.

In addition to the credit points required for a class, there are also prerequisites that communities must meet to achieve Class 6, Class 4, and Class 1. For example, the community must show that it has a minimum Building Code Effectiveness Grading Schedule (BCEGS) classification to achieve a Class 6 or a Class 4. Class 4 and Class 1 have other prerequisites designed to ensure that the community has a balanced and comprehensive floodplain management program.

Table 2-4. CRS Ratings for Oregon.

Rate Class	Credit Points Required	Insurance Discount Assessed	Number of OR Communities in Class
1	4,500+	45%	0
2	4,000 – 4,499	40%	0
3	3,500 – 3,999	35%	0
4	3,000 – 3,499	30%	0
5	2,500 – 2,999	25%	1
6	2,000 – 2,499	20%	8
7	1,500 – 1,999	15%	11
8	1,000 – 1,499	10%	9
9	500 – 999	5%	2
10	0 – 499	0%	3

Source: FEMA brochure, National Flood Insurance Program – Flood Insurance Manual (FEMA 2012d).

CRS Guidelines Potentially Affecting Listed Species

In contrast to other elements of the NFIP where much is prescribed by laws, the criteria and rating system included in the CRS are largely discretionary. The activities associated with incentives in the CRS have been developed by FEMA based on the advice of the Community Rating System Task Force, which contains representatives from stakeholder groups including state and local government, NOAA, and the insurance industry. In the 1994 Act, Congress made only one stipulation on the CRS: that all activities included in the CRS have some relation to reducing flood damage. Therefore, all criteria included must contribute to a reduction in flood risk for the local community. But these criteria can and do address other issues as well.

Three of the four categories of activities included in the CRS have the potential to affect fish and their habitats. These series include: Series 400, Mapping and Regulation; Series 500, Flood Damage Reduction; and Series 600, Flood Preparedness. Changes were made at the national level to these series to better address listed salmon and steelhead species, as a result of the 2008 Biological Opinion on the implementation of the NFIP in Washington State (NMFS 2008c). A summary of the changes to the CRS Coordinators Manual (2013 Manual) as they relate to each sub-element of the 2008 Biological Opinion Reasonable and Prudent Alternative is below.

A. Stormwater Credits

The Stormwater credits have been added to include an incentive for LID techniques. This credit is now a standalone activity (Activity 450).

B. Open Space Credits
Additional Credits have been provided for open space with bonus credits available for open space that has natural and beneficial functions, is located in areas identified as habitat for listed species, or has been preserved through a restoration plan.

C. Retaining and Increasing Riparian Functions
The CRS program has always awarded points for this activity. The revised manual changes the rating standards and increases the number of ways to earn the credit such as maintaining a natural shoreline.

D. Structural mitigation
The weighting forum changed the ratio of points for natural and beneficial functions vs. structural mitigation to incentivize communities to choose activities that provide protection of natural and beneficial functions.

E. Levee Setbacks
The increase in open space credit and natural and beneficial functions credit will incentivize communities to set levees back and create additional open space.

F. Relocate pre-FIRM development
The new manual will reduce the points available for mitigation of structures. The increase in credits available for open space, storm water, and bonus multipliers for Repetitive Loss (x2) and Severe Repetitive Loss (x3) mitigation continue to incentivize mitigation of existing structures. Repetitive Loss and Severe Repetitive Loss structures are typically pre-FIRM structures.

G. Levee Credit
As documented in the CRS Credit for Habitat Protection Guidebook credit has always been provided if a levee owner can provide certification for a vegetated levee. The credit has been revised to require a maintenance plan and performance of required maintenance. The community must demonstrate that all required permits were received for their maintenance program.

H. Highlight actions that benefit Salmonids
There are nine activities that provide points for Natural and Beneficial Functions. As an additional incentive the new CRS Coordinators Manual will require a perquisite number of points obtained in these nine activities for communities to advance to a Class 4 and an additional number of points in these activities to advance to a Class 1. The thresholds have not been determined as of the writing of this report.

I. Buyout Credits

As mentioned above, the credits for buying structures in the floodplain have been reduced, however, additional credits have been introduced for retention of open space and increased watershed master planning especially if the plan has a mechanism to fund recovery projects.

In 2010, FEMA published guidance regarding credits available through the CRS for specific actions that improve or protect habitat for endangered species (FEMA 2010h). The CRS Credit for Habitat Protection Guidebook is designed for local officials and others who work with the NFIP and its floodplain construction standards, but may not be familiar with the Endangered Species Act and its requirements or the Community Rating System and its benefits. The CRS Credit for Habitat Protection Guidebook provides an introductory explanation of the types of habitat that are found in floodplains, a summary of how development adversely affects these habitats, and the many good floodplain management practices that can protect habitat and help reduce and prevent flood damage. Each section identifies where Community Rating System credit can be provided to communities that implement these practices under the 2007 CRS Coordinators Manual. This guidebook will be updated once the CRS Coordinators Manual is approved by the OMB. As summary of the current CRS Credit for Habitat Protection Guidebook is below.

CRS credits are available for the following activities:

- **Planning**–Up to 294 points are available for the inclusion of habitat protection measures in a floodplain management plan (Activity 511).
- **Information and Education**–Up to 769 points are available for a variety of information and education activities such as providing a map information service, outreach projects, disclosing flood hazards, providing a library or website, and providing flood protection assistance (Activities 321, 331, 341, 351, and 361).
- **Managing Floodplain Development**–Up to 2,115 points are available for activities to manage floodplain development by requiring higher standards than the minimum FEMA standards, preserving open space, and through density restrictions in floodplains (Activities 411, 421, and 431).
- **Managing Runoff–Up to 410 poin**ts are available for activities that manage runoff, such as the use of Low Impact Development (LID) techniques, buffer zones, shoreline protection, and other stormwater management Best Management Practices (BMPs) (Activities 431 and 451).

- **Restoring Damaged Areas–The C**RS gives up to 4,225 points for restoring damaged areas through acquisition, preserving land as open space, and drainage system maintenance (Activities 421, 521, and 541).

- **Levee Safety Credit–Activity** 620 provides credit for removing levees in place prior to 1991 or providing a setback from the channel bank.

- **Flood Protection Projects–A**ctivity 530 provides credits for certain flood protection projects that meet ESA standards.

2.2.4 NON-DISCRETIONARY ELEMENTS

Several elements of the NFIP do not afford FEMA any discretion, and therefore are not analyzed in this PLBA. These include (FEMA 2004 - Internal review of NFIP Discretionary and Non-discretionary Actions):

- Issuing flood insurance.
- Handling flood insurance claims.
- Establishing minimum criteria for NFIP communities.
- Denying flood insurance coverage.
- Identifying flood-prone areas.
- Revising SFHA maps to recognize map errors, revisions from physical changes, and revisions based on improved data.
- Revision of flood hazards as a result of appeal or protest.
- Identification of mudslide hazards.
- Review and issuance of LOMAs and LOMRs.
- Use of 1 percent annual chance flood standard.
- Notification of flood map changes.
- Compendia of flood map changes.

FEMA provided further guidance on several non-discretionary elements in response to the Reasonable and Prudent Alternative (RPA) contained in the 2008 Biological Opinion on the implementation of the NFIP in Washington State (NMFS 2008c). These non-discretionary elements are RPA Element 5, components A, B, and D, regarding levee certification and funding for levee repairs.

FEMA does not have discretion over whether to certify a levee constructed within a floodplain using any criteria other than whether the levee will provide protection against the 1-percent-annual-chance flood. Federal regulations (44 CFR 65.10) prescribe FEMA's authority with respect to levee certification. As such, issues of levee vegetation maintenance or additional levee

standards relating to habitat protection or enhancement are outside of FEMA's purview. Similarly, FEMA does not have discretion to provide emergency funding for repairs of levees that have been removed from the USACE Rehabilitation and Inspection Program (RIP) because of increased vegetation.

This document only analyzes the discretionary elements of the NFIP mapping, minimum floodplain criteria, and the CRS.

2.3 RELATED REGULATORY PROGRAMS

Requirements at the federal, state, and local levels guide activities within Oregon's floodplains. These requirements create a complex regulatory tapestry that determines the type and intensity of development within and around the state's waterways. Any proposed development in the floodplain must adhere to regulations addressing shoreline management, threatened and endangered species conservation, dredged and fill material disposal, waterway maintenance, growth management, and numerous other criteria. These many directives represent the critical determinants of the NFIP-covered properties, as any property owner seeking a floodplain development permit must first demonstrate that "all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law…" (44 CFR § 60.3 (a)(2)).

Given the multi-tiered regulatory environment within which the NFIP exists, it is important to understand the functions of these various regulations, how they individually and collectively interact to influence development within the floodplain, and the role each plays in relation to the NFIP. The remainder of this subsection provides background information on floodplain-related regulatory programs at the federal, state, and local levels.

2.3.1 FEDERAL PROGRAMS

Several regulatory programs at the federal level affect floodplain development, six of which are described below: (1) Sections 404 and 401 of the Clean Water Act; (2) Sections 9 and 10 of the Rivers and Harbors Act; (3) Executive Order 11988; (4) the National Environmental Policy Act (NEPA); (5) the ESA; and (6) the Coastal Zone Management Act. Each of these regulatory programs influences activities in and near waterways in important but different ways.

Section 404 and 401 of the Clean Water Act

The purpose of the Clean Water Act (CWA), passed in 1972, is to maintain surface water quality through the control and reduction of water pollutants. Through a variety of regulatory and non-regulatory initiatives, the CWA ensures the physical and biological integrity of the nation's waterways, including wetlands. Although the CWA covers a range of activities, two primary components, Sections 404 and 401, most directly influence development and related activities within floodplains.

Section 404 of CWA addresses activities associated with the dredging or placement of fill material into U.S. waterways. "Fill material" includes not just soil or dredge material but bridge footings, pier pilings, or other man-made materials. Under this section, the USACE must approve a permit for any activity that includes the discharge of dredged or fill material into wetlands or other waters of the U.S. Permits provided by the USACE fall into one of two categories: individual or general. Individual permits are required for specific activities that may potentially create significant impacts. Such activities include dams, levees, and highways along the waterway. General permits may be granted by the USACE on a nation-wide, state-wide, or regional basis for activities that produce only minimally adverse effects. These general permits may cover individual actions or a collection of actions, such as minor road crossings, and utility line backfill. Thus, the USACE has a direct authority regulating wetlands, and 404 permits are one regulatory mechanism that affects development along river corridors.

In addition to the USACE, the U.S. Environmental Protection Agency (EPA) plays a key oversight role in the implementation of Section 404 through the Section 401 water quality certification process, which is required for issuance of a Section 404 permit. CWA 401 authority in Oregon has been delegated to the Oregon Department of Environmental Quality (DEQ). The main function of Section 401 is the preservation and improvement of water quality conditions. Applicants for a federal permit must demonstrate that a development approval has been received from either the state in which the proposed discharge will originate or the interstate water pollution control agency with jurisdiction over the navigable waters in question. As a result, all federal permits, including those issued by the USACE, must also meet all applicable state (or interstate) water management provisions.

The National Pollutant Discharge Elimination System (NPDES) is an element of the CWA that regulates point source discharges to surface waters. NPDES permits are issued for various activities. Permits are either general permits available for certain classes of regulated activities, or individual permits written for specific permittees. The NPDES program is administered at the state level. In Oregon, DEQ is the administering agency.

Two components of the NPDES program are particularly relevant to development in floodplains. The first is a permit requirement for operators of municipal storm sewer systems, generally cities or counties, but in some cases other public entities such as colleges. The permit requires storm system operators to develop stormwater management plans. The municipal stormwater permit program affects floodplain development through the implementation of stormwater regulations necessary to meet permit requirements.

The second relevant component of the process is the construction stormwater general permit. This permit is required for any development that involves earth-moving or ground-clearing for

areas larger than 1 acre. The permit requires the preparation of erosion and sedimentation control and stormwater management plans and the implementation of BMPs during construction. The intent of the permit is to prevent the discharge of harmful pollutants to surface water and the prevention of sedimentation resulting from erosion.

Sections 9 and 10 of the Rivers and Harbors Act

Sections 9 and 10 of the Rivers and Harbors Act represent additional federal legislation that influences the type and intensity of development around navigable waters. Originally passed in 1899, Section 9 of the Act prohibits bridges, dams, dikes, or causeways to be constructed over or within U.S. navigable waters without Congressional approval (33 U.S.C. § 403, Chapter 425). Both the U.S. Coast Guard and the USACE have jurisdictional authority in the administration of Section 9. State legislatures may authorize the construction of such structures if the affected navigable waters are contained wholly within the state. Section 10 requires approval from the Chief of Engineers for the construction of wharfs, piers, jetties, or other structures. These provisions establish substantial federal authority over many actions in Oregon's floodplains.

Executive Order 11988 – Floodplain Management

Issued in 1977, Executive Order 11988 – Floodplain Management required all federal agencies to consider and minimize the risk and impacts of a range of actions on flood management, human health and safety, and natural function of floodplains. Actions impacted under the order include the acquisition, management, and disposal of federal facilities and land; federally financed or assisted construction and improvements; and federal land use programs and activities (42 Federal Register [FR] 26951). Prior to any federal action, the agency must determine whether the proposed action will occur in the floodplain, consider alternatives "to avoid adverse effects and incompatible development in the floodplains," notify state and local agencies of the action, and provide an opportunity for public review and comment. The Executive Order requires at a minimum that federal structures and facilities meet the minimum requirements of the NFIP, although federal agencies are generally held to a higher standard than the private development regulated by NFIP communities. Federal agencies often can decide not to fund a project (no action) or require that the project be modified prior to funding it to meet the requirements of the order. Executive Order 11988 reviews are generally conducted as part of environmental review under NEPA. However, they still must be undertaken in situations where no NEPA review is required.

National Environmental Policy Act

NEPA, signed into law in 1969, established a process by which the environmental impacts of federal actions (or actions with a federal nexus) are considered during decision-making. As such, NEPA requires that all proposals on federal legislation or action include an analysis of: (1) the environmental impacts of the proposed action; (2) any unavoidable adverse environmental effects of the proposal; (3) alternatives to the proposed action; and (4) a discussion of short-term

and long-term effects of the proposal on the environment. Through the preparation of Environmental Assessments (EAs) and Environmental Impact Statements (EISs), project impacts related to fish and wildlife (especially listed species), transportation, land use, environmental justice, and a host of other topics are analyzed. The level of NEPA analysis—either an EA or an EIS—depends upon the magnitude of impacts and the ability of the applicant to successfully mitigate those impacts.

Endangered Species Act

The ESA influences development near waterways through species and habitat protection. This is particularly true in Oregon where a number of anadromous fish species are listed as threatened or endangered. The specific purpose of the ESA, which initially became law in 1973, is to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved…" and to contribute to the re-establishment of these species. Under Section 7 of the Act, federal agencies must consult with NMFS or USFWS if a project has the potential to affect a federally listed or proposed threatened or endangered species. Additionally, Section 4(d) of the ESA authorizes NMFS to issue regulations, or rules, for the conservation of threatened species, and to apply the "take" prohibitions of ESA section 9(a)(1). "Take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct," and is interpreted to include altering threatened or endangered species habitat in such a way as to cause a take. Section 10 of the ESA provides for NMFS and USFWS to allow "incidental take" permits for projects when their effect is considered minimal. Habitat Conservation Plans (HCPs) are developed and packaged with a request for an Incidental Take Permit.

Upon issuing a rule under 4(d), NMFS proposes regulations deemed "necessary and advisable to provide for the conservation of the species." Regulations utilized may include any or all of the prohibitions contained in Section 9 of the ESA, as well as other actions deemed necessary to protect special status species. These conservation measures may apply to development activities, programs, and/or regulatory actions. After consultation with NMFS, a federal, state, or local agency may implement programs that meet the aims of the 4(d) rule while also establishing exemptions for particular activities. In some cases, "exempt" activities may result in take as long as the program as a whole adequately protects the listed species. Enforcement of 4(d) rules is the responsibility of the affected communities and NMFS.

NMFS published 4(d) rules for salmon and steelhead listed along the west coast of the U.S. in 2000 (NMFS 2000). The rules stipulate a number of "limits," or programs and activities, where NMFS will not apply "take" provisions if the program follows NMFS' guidelines. NMFS provided guidelines for 13 program types including activities such as those covered by HCPs, for which an incidental take permit has been granted pursuant to Section 10 of the ESA (Limit #1); fisheries management (Limit #4); water diversion screening (Limit #9); and Municipal,

Residential, Commercial, and Industrial (MRCI) Development and Redevelopment Activities (Limit #12). These guidelines have prompted many governmental entities to seek approval for programs and exemptions under the rule.

Limit #12 allows NMFS to not apply take prohibitions to MRCI development or redevelopment that is regulated by city, county, or regional government ordinances and plans that NMFS has determined adequately protect listed species, based on 12 evaluation criteria (described below). Some or all of these criteria must be met by an ordinance or plan seeking to avoid take prohibitions under this limit. The criteria evaluate whether an ordinance or plan: (1) ensures that development avoids certain sensitive areas; (2) adequately prevents stormwater discharge impacts; (3) limits development in riparian areas and requires compensatory mitigation for any impacts; (4) avoids or minimizes impacts of stream crossings; (5) protects historic stream meander patterns or channel migration zones and avoids stream bank and shoreline hardening; (6) protects wetlands; (7) preserves stream hydrologic capacity; (8) encourages the use of native vegetation and reduction of herbicides, pesticides, and fertilizers; (9) prevents erosion and sedimentation resulting from construction activities; (10) ensures that water demand does not affect streamflows needed by salmon; (11) contains mechanisms for monitoring, enforcement, funding, and implementation; and (12) complies with all other state and federal environmental laws and permitting requirements.

Outside of the regulatory framework of Section 7, ESA, regional salmon recovery efforts have been developed and involve a range of governmental, tribal, and non-governmental organizations. Examples of efforts within Oregon include the Oregon Plan for Salmon and Watersheds (State of Oregon 1997) and the Upper Willamette River Conservation and Recovery Plan for Chinook Salmon and Steelhead (ODFW and NMFS 2010).

Coastal Zone Management Act

The 1972 Coastal Zone Management Act (CZMA) requires coastal states, including Oregon, to manage their coastal zones through a partnership with the federal government. The CZMA calls for the "effective management, beneficial use, protection, and development" of the nation's coastal zone and promotes active state involvement in achieving these goals. The CZMA requires participating coastal states to develop management programs that demonstrate how they will carry out their obligations and responsibilities to manage their coastal zone. Upon federal approval of a state's coastal zone management program, the state benefits by becoming eligible for federal coastal zone grants. Grant allocation is based on the total number of shoreline miles and shoreline population density within the state. The DLCD oversees the Oregon Coastal Management Program. The program protects wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and fish and wildlife habitat. Through joint programs with the federal government, the program is intended to provide comprehensive management of coastal zone

resources through coordinated permit processes, land owner assistance, and grants to communities. Oregon's Coastal Management Program is described further below.

2.3.2 STATE PROGRAMS

Given that floodplains represent a common source of habitat for threatened and endangered populations, new development proposed within Oregon's floodplains is frequently required to adhere to ESA requirements. The following narrative summarizes how the NFIP is implemented in Oregon and the role the state of Oregon has in coordinating the program, the Statewide Planning Program, and other programs in the state that affect development in floodplains.

Oregon's Statewide Planning Program requires communities to address flood hazards, and specifies that participation in the NFIP constitutes compliance with this requirement. As a result, all 260 Oregon communities with identified special flood hazards and nine communities with no flood hazards participate in the NFIP. DLCD has been designated by the Governor as the state's coordinating agency for the NFIP. DLCD serves as a technical resource for local communities for flood hazard planning and for adherence to NFIP program elements such as the CRS. DLCD conducts CAVs and coordinates FEMA's mapping program in the state. DLCD also has responsibility to ensure local government compliance with the Statewide Planning Program in general, and with flood hazard planning requirements of the program specifically.

Statewide Planning Program

Beginning in 1973, the State of Oregon passed legislation that established a Statewide Planning Program for land use. The program consists of 19 statewide goals addressing land use, housing, natural resources, economic development, citizen involvement, and related issues. The goals contain broad policy statements and guidelines and few specific requirements (except for coastal goals). More specific requirements pursuant to the goals are codified in the Oregon Revised Statutes (ORS) and Oregon Administrative Rules (OAR).

The primary mechanism for implementing the Statewide Planning Program is the requirement for all local governments to develop comprehensive plans and implementing measures that are consistent with the statewide goals. A local government's zoning, land division, and other land use ordinances must be consistent with its comprehensive plan. When the communities initially developed their comprehensive plans, these required approval by the Land Conservation and Development Commission (LCDC). Once the plans are in place, any amendments to the plans require review and approval by DLCD. A public process is required to amend the statewide planning goals or the administrative rules, with LCDC having final approval authority. DLCD, which serves as staff to LCDC, makes recommendations for statewide goal amendments or rule changes. If changes are made to statewide planning goals, local governments have 3 to 5 years (more for Goal 5) to come into compliance with the new requirements, depending upon the goal's applicability.

Flood Hazard Planning

Statewide Planning Goal 7 relates to natural hazard planning, including planning for flood hazards. The goal requires local governments to conduct inventories of natural hazards and to adopt policies within their comprehensive plans and implementing measures to reduce the risks of hazards to people and property. Goal 7 also contains a requirement that local governments update their comprehensive plans and implementing measures within 3 years if DLCD notifies them of new information regarding natural hazards. Goal 7 specifically states that participation in the NFIP constitutes compliance with Goal 7 with respect to riverine flood hazards. Goal 7 goes further with several non-binding guidelines encouraging communities to adopt standards that exceed minimum NFIP criteria by limiting placement of fill in floodplains, prohibiting the storage of hazardous materials in floodplains, requiring structures to be elevated to a level higher than that required by the NFIP or the State Building Code, and by participating in the CRS.

To comply with the flood hazard planning requirements of Goal 7, local governments must adopt measures to reduce the risk of flood hazards. DLCD has developed an updated Model Floodplain Ordinance, which FEMA has approved. Most communities have adopted this ordinance or a similar floodplain ordinance. However, some communities have stricter ordinances and/or have requirements relating to floodplain management contained in other areas of their local codes, such as in their zoning or environmental codes. Other local implementing measures that may affect development in floodplains include ordinances that regulate land division, engineering and design standards for roads, structures, or stormwater management, and the establishment of Urban Growth Boundaries that limit the area where urban development can occur. Changes to local ordinances or codes implemented pursuant to the Statewide Planning Goals, including Goal 7, require DLCD review and approval.

Local building codes must meet minimum requirements established by the State Building Code Division, which contains requirements related to flood-resistant construction. The Oregon Residential Specialty Code, for example, requires that the lowest floor of a residential structure be built a minimum of 1 foot above the BFE.

Other Statewide Goals Affecting Floodplain Development

Several other Statewide Planning Goals affect floodplain development, as described below.

- **Goal 2** established the land use planning process and policy framework, including the requirement to develop comprehensive plans and implementing measures. Local comprehensive plans should be consistent with all local, state, federal, and special district actions relating to land use as required by the Statewide Planning Program.
- **Goal 5** relates to natural resources, including riparian habitat. This goal requires local governments to conduct inventories of natural resources, including corridors, wetlands,

and wildlife habitat, and to adopt measures for the protection of those resources. While not specifically related to flood hazards, this goal will have a significant effect on any development in floodplains, especially with regard to impacts on fish and wildlife habitat. Unfortunately, the state's ability to enforce application of Goal 5 is minimal. Goal 5 has a detailed set of state administrative rules (OAR 660-023) that guide local government in natural resource planning. The rules outline procedures for inventories of significant natural resources, including riparian corridors, the identification of potentially conflicting uses (e.g., a land use with a potential adverse effect on a natural resource), and an economic, social, environmental, and energy (ESEE) decision process for evaluating when to allow, prohibit, or place limitations on potentially conflicting uses.

As an alternative to the standard inventory process, local governments can take a "safe harbor" course of action, allowing them to apply predetermined setback distances from riparian corridors ranging from 50 to 75 feet, or to the edge of any significant wetland within the riparian corridor. There is a safe harbor for the inventory of significant riparian resources and a safe harbor for developing a program to protect the resource. Even when both safe harbors are applied, significant development is still allowed in the riparian area. (See OAR 660-23-0090(8).)

The Goal 5 process and standards do not apply when local governments adopt restrictions on development in riparian areas to comply with Goal 7 (the flood hazard planning requirement). The requirements of Goals 15, 16, 17 (described below), and 19 (relating to use of ocean resources) supersede Goal 5 requirements.

- **Goal 15** provides the basis for a Willamette River Greenway program to plan for land adjacent to the Willamette River. The plan emphasizes the conservation of natural resources and the prioritization of water-dependent uses. The location the Willamette River floodplain was considered in establishing the boundary. The greenway boundaries and development review criteria are included in the comprehensive plan of each city and county.

- **Goal 16** requires the development of comprehensive management programs for all estuaries in the state by appropriate local, state, or federal agencies. The goal prioritizes uses that protect the integrity of the estuary ecosystem as well as water-dependent uses.

- **Goal 17** relates to the use of coastal shorelands and mandates that local land use plans and permits consider the relationships between natural resources, hazards, and other social and economic values of coastal shorelands. Goal 17 prioritizes uses that maintain the integrity of estuaries and coastal waters as well as water-dependent uses. The goal contains a requirement for local jurisdictions to conduct shoreland inventories and to develop goals and policies in their comprehensive plans related to the uses of coastal shorelands. Coastal shorelands include land subject to ocean flooding, and Goal 17

contains a specific requirement for local communities to develop their comprehensive plans in such a way as to exceed the minimum requirements of the NFIP as well as the Flood Disaster Protection Act of 1973.

- **Goal 18** requires local comprehensive plans and policies to regulate the use of beach and dune areas. The goal includes a provision that local and state governments prohibit residential, commercial, and industrial development on beaches, dunes subject to ocean overtopping or undercutting, and interdunal areas subject to ocean flooding. Other development may be allowed in this area if it can be demonstrated that it is adequately protected from hazards, including flood hazards.

Oregon Plan for Salmon and Watersheds

The Oregon Plan for Salmon and Watersheds (State of Oregon 1997), otherwise known as the Oregon Plan, was developed in the late-1990s with NMFS review and input as a comprehensive conservation strategy for recovery of salmonid populations. The plan began as the Oregon Coastal Salmon Restoration Initiative, but was subsequently broadened in scope to address all native salmon and steelhead species in the state and to address overall watershed health. The Oregon Plan is funded through a variety of mechanisms including state lottery funds and a surcharge for special salmon vehicle license plates. The plan takes a largely non-regulatory approach, focused on research, restoration, and monitoring, structured around four key strategies: (1) agency coordination, (2) community-sponsored action, (3) monitoring, and (4) adaptive management. Ultimate responsibility for implementation of the plan lies with the Governor and the Governor's Natural Resources Office. The Oregon Watershed Enhancement Board (OWEB) plays a significant role in agency coordination as well as in grant administration. The plan makes use of teams of representatives from local watershed councils, Soil and Water Conservation Districts, affected state natural resource agencies, and other local, regional, and federal agencies.

Permits for Floodplain or In-Water Development

Coastal Management Program

DLCD administers the Coastal Management Program pursuant to the federal CZMA. The program affects floodplain development by requiring a federal consistency review for projects requiring a federal license or permit within the coastal zone. The coastal zone extends from the crest of the coast range to the boundary of the territorial sea. Federal consistency involves evaluating proposed projects for consistency with the enforceable policies of the statewide planning goals, comprehensive plans and land use regulations of local governments, and the requirements of Oregon state agencies with regulatory authority. A consistency certification is required to be obtained before federal permits will be issued.

Removal-Fill Permit

The Oregon Department of State Lands (DSL) issues removal-fill permits for projects involving 50 cubic yards or more of alteration of streambeds, stream banks, or in wetlands. For projects in areas designated as essential salmon habitat waterways or state scenic waterways, any amount of alteration requires a removal-fill permit. DSL issues both individual permits and general permits. DSL issues general authorizations for some limited types of projects and emergency authorizations for very limited circumstances where there is an immediate threat to public health, safety, or substantial property. A general permit is comparable to a USACE nationwide permit in that it covers a class of activities, provided that specific criteria are met in carrying out a project. Some activities are exempt from requiring a permit. Typical projects require individual permits, however. Projects requiring removal-fill permits frequently require Section 10 and/or Section 404 permits from the USACE. Oregon has a joint application form that can be used to coordinate the state and federal permits. A DSL permit will always also require a floodplain development permit if the waterway has an SFHA provided by FEMA.

DSL will issue a removal-fill permit for projects that propose a practical option that has the least adverse effect on the wetland or waterway and its navigation, fishing, and public recreation uses. DSL also evaluates the project for whether it will increase flooding or erosion on adjacent land. The Oregon Department of Fish and Wildlife (ODFW) may comment on removal-fill permit applications and recommend mitigation (and in some cases denial) where there is the potential for the loss of fish and/or wildlife habitat.

Where waterways intersect with coastal beaches, the Oregon Parks and Recreation Department (OPRD) issues an Ocean Shore Permit in lieu of the removal-fill permit.

1200-C Construction Stormwater NPDES Permit

The Oregon DEQ administers the NPDES program in Oregon. A 1200-C permit is required for construction activities that disturb 1 or more acres of land. The primary purpose of a 1200-C permit is to limit erosion and sedimentation of waterways. The permit requires the preparation and implementation of construction stormwater management, erosion, and sedimentation control plans. Jurisdictions that fall under NPDES phase I and II requirements for Municipal Separated Storm Sewer permits (MS4 permits) require erosion and sediment control on construction projects that disturb less than 1 acre.

401 Water Quality Certification

A 401 Water Quality Certification (WQC) is required for federal actions that involve a potential discharge to waters of the state. Projects requiring a Section 404 permit are required to obtain a 401 WQC from DEQ. The 401 WQC is intended to certify that permitted activities will not violate applicable state water quality standards.

Other Water-Quality Programs

DEQ administers a number of other programs related to water quality that may affect development in floodplains. These include requirements for pollutant load reduction plans from jurisdictions assigned load allocations under a Total Maximum Daily Load (TMDL) for a water quality limited stream, and all individual or general NPDES permits.

Fish Passage Requirement

Projects that propose any artificial obstruction of waters in which migratory fish are or were historically present must comply with ODFW requirements for fish passage. Artificial obstructions include road crossings or culverts as well as levees or dikes. There is no specific permit application for obtaining this approval; however, approval can be obtained within DSL's removal-fill permit approval process using Oregon's joint permit application. Approval requires the preparation of a fish passage plan. Programmatic approval can be obtained on a case-by-case basis for multiple obstructions of the same type.

In-Water Timing Guidelines

ODFW applies in-water work timing guidelines to projects requiring in-water work permits, such as DSL's removal-fill permit. Timing considerations are intended to prevent work from occurring during the vulnerable life stages of important fish species, including migration, spawning, and rearing.

Ocean Shore Permit

Alterations requiring 50 or more cubic yards of material located between the extreme low tide of marine waters and the statutory vegetation line of established upland shore vegetation require an Ocean Shore Permit from OPRD in lieu of a removal-fill permit. Since the public has free and uninterrupted use of beaches along the Oregon coast, projects requiring this permit would typically be limited to shoreline stabilization, bridge, culvert, or similar projects.

2.3.3 LOCAL PROGRAMS

Local jurisdictions in Oregon regulate land use in a variety of ways. Every jurisdiction in the state with planning authority is required to develop a comprehensive plan and implementing measures consistent with the Statewide Planning Goals. The comprehensive plan and development code establish zoning designations and permitted uses within those zoning designations, some of which regulate the types and intensity of development within floodplains. As noted above, Goal 7 requires communities to regulate development in the floodplain. This is achieved by either a floodplain ordinance and permit requirements, or through a combination of rules and permitting requirements, located elsewhere in a community's municipal or county code. Goal 5 requires local jurisdictions to protect significant natural resources, including riparian areas.

The Goal 5 and Goal 7 requirements are described in more detail above. The discussion of several example communities (Section 3.5) provides more detailed information regarding the regulation of floodplain development within specific jurisdictions.

2.3.4 SYNTHESIS OF PROGRAM INTERSECTIONS

The preceding discussion demonstrates that a complex and overlapping set of planning processes, land use regulations, permitting requirements, and design criteria at multiple jurisdictional scales operate concurrent with the NFIP to affect floodplain development. The points of intersection of these programs with each other and with the NFIP vary according to the type and scale of development proposed. All development is regulated to some extent by local planning authority, as mandated pursuant to the Statewide Planning Program.

It is important to note that FEMA has no jurisdiction in local land use development decisions. For instance, a municipality could proceed to allow fill in a floodplain in accordance with their flood ordinance without FEMA coordination. As a result of the NFIP update in Washington and new nationwide guidance for LOMCs, local jurisdictions must show how they are coordinating with NMFS and USFWS on such actions should a request be submitted to FEMA for approval.

Whether a particular type and scale of development is allowed at all in a particular location is determined by the local zoning code and if the community has chosen NFIP minimal standards or has adopted a higher level of regulation. The location of a development relative to a floodplain will be affected by setback and buffer requirements established to protect significant natural resources, pursuant to Goal 5. Details regarding the design of a development, from site planning and circulation requirements, to stormwater management, to the design and construction of individual buildings, are determined by various local ordinances.

A small development in a floodplain, such as a single-family residence, may only be affected by a limited set of local requirements, as well as the minimum criteria established by the NFIP. State and federal regulations may only affect such a development indirectly (i.e., through requirements placed on a local jurisdiction to plan for and regulate development through zoning, or through stormwater management ordinances).

A larger development in a floodplain (for instance a commercial “big box” retail development that may require grading an area of land over 1 acre, wetland fill, in-water work, access and egress onto a state or federal highway, or a proposal requiring an amendment to a local comprehensive plan or code) would be subject to more regulations and permitting requirements, in addition to local land use regulation and NFIP minimum criteria. This larger development will also require more permits at various stages in the development process. For instance, the site clearing and grading may require a floodplain permit from the local jurisdiction, a removal-fill permit from the state for any in-water or wetland fill, USACE Section 10 and/or Section 404

permits, and WQC and CZMA reviews by the state. These permits would all be required in the preliminary planning stages of the project. The applicant or the community may wish to obtain a CLOMR-F from FEMA at this stage. At the construction stage, the site development may require a construction stormwater permit from DEQ and would need to comply with local engineering design standards. Following site development activities, a LOMR-F may be obtained.

At each stage in this process, different criteria will affect the physical development of the project. Some criteria are unrelated to habitat impacts—for instance, engineering design standards intended to ensure the proper functioning of road or utility systems, or the structural stability of an engineered fill. However, many of these regulations and permitting processes include criteria specific to habitat or water quality impacts, with the authority to deny a permit, or to require mitigation for impacts, resting with multiple reviewing agencies.

In Oregon, planning and permitting requirements, aside from federal programs, are largely driven by a "top-down" process. The Statewide Planning Program mandates local planning, and requires state review of local plans and ordinances affecting development in floodplains. Thus, local participation in the NFIP is directed by the state. Therefore, the implementation of NFIP changes in Oregon will require significant state involvement. State mandates must be balanced with local circumstances and resources, however. A small community with little development pressure and minimal flood hazards may be unduly burdened by onerous planning requirements if a one size fits all approach is applied across the whole state. Options for implementing changes to the NFIP in Oregon, within the context of this regulatory environment, are described in Section 2.5.

2.4 ELEMENTS OF NFIP CHANGES IN WASHINGTON FOR CONSIDERATION IN OREGON

Recent changes to NFIP implementation in Washington State have occurred as a result of formal consultation between FEMA and NMFS to protect ESA-listed fish and address specific RPAs outlined in the NMFS Biological Opinion (NMFS 2008c), further defined in FEMA's letter to NMFS (April 24, 2009) (FEMA 2009a), and in a further clarification letter (June 17, 2009) (FEMA 2009b). Because of the extensive coordination between FEMA and NMFS on these issues that could be pertinent to Oregon, a summary of the major implementation efforts for the Washington RPA that may have relevance to Oregon are described below. Portions of these elements are adopted for implementation in Oregon in addition to other Oregon-specific measures. Later in this section, a summary is provided that details all of the elements that will be implemented in Oregon.

2.4.1 ELEMENT 2 – MAPPING

In response to the Biological Opinion, FEMA distributed Regional Guidance for NFIP-ESA Hydrologic and Hydraulic Studies that are available on the FEMA website (FEMA 2010a).

Based on this Washington foundation, similar guidance will be made available to Oregon communities. The Regional Guidance is intended to augment national guidance to better fit regional conditions, particularly special ESA provisions for Washington. Incorporating this guidance into flood hazard mapping will help communities meet the ESA requirements, and provide for more effective programs to prevent and reduce the dangers and damage caused by floods and migrating stream channels.

Element 2A: Letters of Map Change

On August 18, 2010, FEMA Headquarters issued nationwide Procedure Memorandum (PM) 64 to revise the LOMC process to require CLOMR-Fs and CLOMRs for applications received after October 1, 2010 to demonstrate compliance with the ESA (FEMA 2010b). Requestors are now required to provide a Biological Assessment to determine if a Section 7 consultation with NMFS or the USFWS is needed. For LOMRs and LOMR-Fs, ESA compliance will need to be demonstrated when the permit is issued by the local government. See Element 3, below. These elements already apply to Oregon under the nationwide PM 64.

Element 2B: Mapping Priorities

FEMA Region X prioritizes the development of Flood Insurance Studies based on the following factors: assessment of risk, evaluation of need to update data, available terrain data, and local contribution of data. As a result of congressional appropriations, FEMA Headquarters establishes targets in different study types that affect how Region X identifies fiscal year procurement objectives. For example, categories for study production in the past reflected the following: coastal, levee, other engineering needs, and potential partnerships with established Cooperating Technical Partners through FEMA's grant program. As part of the risk assessment input, variables related to insurance claims, policies, losses, and disasters are included. Region X also includes GIS data pertaining to the listed endangered species as well as input from the states regarding factors such as climate change, floodplain development pressure, growth, land use changes, and areas without digitized FIRMs. National guidance places a strong emphasis on coastal work and prioritization of riverine areas based on the assessment of risk (45 percent), evaluation of need to update data (45 percent), and available terrain data (10 percent). For prioritization of Fiscal Year (FY) 11 studies and all future studies, Region X expanded on the risk assessment portion of the algorithm used for prioritizing mapping studies to incorporate data on listed endangered species and factor this aspect into the prioritization of new studies on a watershed level in addition to setting coastal priorities. Simply put, ESA species and habitat will influence the algorithm used to determine which studies are funded each year.

As the Map Modernization Program concludes and the new Risk MAP program launches, Region X seeks to work with federal, tribal, state, and local stakeholders to identify and assess risk aspects pertaining to multiple hazards to develop products that effectively communicate risk in a nonregulatory manner. An example of this is to include mapped channel migration zones in

the risk database accompanying the digital FIRM dataset. Additionally, Risk MAP opens up opportunities to partner with other federal agencies, tribal governments, state agencies, and local jurisdictions to develop data, products, and outreach strategies that cross disciplines and meet objectives of multiple programs.

Element 2C: Modeling

The Regional Guidance for Hydrologic and Hydraulic Studies provides more specific advice for applying different models; however, it does not supersede the technical requirements for applying a specific model provided in the revised Appendix C to the Guidelines and Specifications. The guidance provides advice on when a 2D model should be used in place of a steady state model. FEMA is conducting a comprehensive analysis of potential changes in precipitation intensity and patterns, coastal storms, sea level rise, and other natural processes affecting both riverine and coastal flooding based on source materials from other agencies and researchers versed in climate change studies.

2.4.2 ELEMENT 3 – FLOODPLAIN MANAGEMENT CRITERIA

When implementing floodplain management, NFIP communities have three options for ESA compliance. Two options involve coordination with FEMA, and a third option involves direct coordination with NMFS. FEMA offers two ways for a community to meet this "program wide" requirement:

1. Adopt a Model Ordinance that meets the criteria specified by the Washington RPA or,
2. Demonstrate that existing ordinances and/or procedures, such as the growth management, zoning, or critical areas regulations, meet the requirements outlined in the RPA. FEMA developed a checklist for helping communities match their regulations with the RPA requirements.

If a community chooses not to enact regulations under the two options described above, then a third option of showing compliance with ESA (outside of FEMA review) on a permit-by permit-basis will be required. This will typically involve requiring applicants for floodplain development permits to submit habitat assessments and impact analyses with their applications. If the habitat assessment concludes that the project will adversely affect listed species or critical habitat, then a community may deny the permit or direct an applicant to seek consultation under Section 7 (with another federal agency) or Section 10 of the ESA. NFIP communities must ensure that permit applicants have demonstrated compliance with ESA before issuing a floodplain development permit, per the NFIP regulations (44 CFR 60.3(a) (2)), which states,"…to assure that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law."

Under both program-wide approaches, NFIP communities must ensure that permit applicants meet the criteria established in the Biological Opinion. If option 3 is chosen, NFIP communities must ensure that permit applicants have obtained compliance with ESA before issuing a floodplain development permit when applicable.

2.4.3 Element 4 – Community Rating System

As of February 22, 2010, FEMA has finalized the *CRS Credit for Habitat Protection Guidebook* (FEMA 2010c), which highlights the CRS credits for natural and beneficial functions that are currently in the CRS program. Each section identifies where CRS credit can be provided to communities that implement these practices. This program is applicable to Oregon.

2.4.4 Element 5 –Addressing the effects of Certain Types of Construction in the Floodplain

FEMA will continue to conduct work in floodplains through the Hazard Mitigation Assistance (HMA) projects, which may include acquisition/demolition of flood-prone properties for conversion to permanent open space. Acquisition of flood-prone structures requires the property to remain undeveloped in perpetuity; thus, it is expected that a net gain in habitat functions will occur once the structures are removed.

2.4.5 Element 7 – Monitoring and Adaptive Management

FEMA has developed an interactive website to reach out to communities and citizens in both Washington and Oregon (http://www.fema.gov/national-flood-insurance-program-endangered-species-act) . The website includes a Floodplain Habitat Assessment and Mitigation guidance document to assist communities in Puget Sound to evaluate and document estimated possible impacts on ESA-listed species and their critical habitats from proposed projects with the 100-year floodplain. The website also contains examples of correspondence sent to the communities, the model ordinance and NFIP-ESA checklist for Puget Sound, , other guidance documents, samples of habitat assessments, on-line training opportunities, and other useful links for communities and citizens seeking more information on the NFIP and compliance with the ESA.

FEMA has participated in over 140 public meetings, conferences, or workshops in Washington to date to inform communities, public partnerships, tribes, and other interested parties. NMFS participated in many of these events, including presenting portions of public workshop sessions with FEMA staff. These workshops introduced staff from cities, counties, and tribes how to be comply with the BO issued by NMFS for the NFIP within Puget Sound. The variety of public meeting, working groups, and workshops provide opportunities for FEMA and NMFS staff to explain the process for complying with the Biological Opinion and the ESA.

2.5 ADDITIONAL PROPOSED ACTIVITIES FOR NFIP IMPLEMENTATION IN OREGON

2.5.1 MAPPING

FEMA Region X will provide guidance on the use of other flood mapping models, such as unsteady state models and two-dimensional mapping models that can provide additional considerations for habitat features. Steady state step-backwater models only address the carrying capacity of a floodplain, whereas unsteady state models have the ability to calculate the impact of loss of storage within the floodplain due to development or other physical changes. Two-dimensional models calculate direction of overbank flow. Additionally, the guidance will explore the integration of FEMA Region X flood modeling data with other habitat models currently in use by ecologists, fisheries scientists, and other similar disciplines.

FEMA Region X will incorporate ESA species and critical habitat information early into its map sequencing process. Currently, it takes 47 distinct steps to issue a new floodplain map. FEMA Region X will incorporate species information and habitat at Step 2 of the sequence process. See *Sequencing Game* in Appendix D for an outline of the FEMA Region X sequencing steps. The consideration of species at Step 2 will provide equal emphasis with needs, data, and risk factors currently driving sequencing. This will not necessarily eliminate those communities without ESA species/habitat from the priority list for mapping, as their needs or risks may be of significance to outweigh the lack of species or critical habitat presence. However, if two communities with equal need, data, and risk factors were to be selected as high priority for mapping updates, the community with species/habitat would be selected over the community without species/habitat present.

FEMA Region X is implementing a screening process to flag LOMR-Fs issued to communities for prioritization in follow-up monitoring and enforcement actions. FEMA Region X evaluates all LOMR-Fs and gives consideration to those communities with issued LOMR-Fs for conducting CAVs and CACs.

Extensive discussion has occurred over recent years between FEMA, NMFS and other government agencies about the potential changes to existing habitat functions and processes due to natural, ongoing lateral channel migrations in some stream channel reaches, especially in relatively shallow gradient alluvial river systems. Estimating the spatial extent of possible plan view channel changes in future decades within an estimated channel migration zone (CMZ) can provide communities very valuable data regarding possible impacts to instream and riparian habitat functions, as well as information regarding the relative 1% chance flood risk to infrastructure and public safety for proposed land development actions within the CMZ. The extent of the estimated CMZ is largely based on observed changes over previous decades using historic aerial imagery and other data, and field observations of geomorphic features. In some

cases past land development actions may have limited or constricted a river system's ability to react to variations in hydrologic or sediment regimes through natural lateral adjustments in channel location and geometry.

FEMA will require that communities utilize best available science (BAS) in assessing current baseline conditions and analyzing the effects of proposed actions upon ESA-listed species and their designated critical habitats. If a community has information or mapping regarding the CMZ, that information is expected to be utilized as best available science. If the information is available in a digital format and provided to FEMA, that information will be made available to the jurisdiction as a data layer in the risk database accompanying the digital FIRM dataset.

2.5.2 IMPLEMENTATION OF REGULATIONS

FEMA Region X will provide clarification, through guidance, that participating communities are required to address compliance with the ESA prior to issuance of their floodplain development permit.

FEMA regulations under 44 CFR Part 60.3, Section a.2 state that participating communities shall "…review all floodplain development permits to determine that all necessary permits have been obtained from those Federal, State, or local governmental agencies from which prior approval is required." The regulation also includes as an example a USACE Section 404 permit. The inclusion of the USACE permit is not all-inclusive but is just an example of a federal permit. Past implementation efforts by local jurisdictions concentrated only on checking for USACE permits to demonstrate compliance with the federal permit requirements.

FEMA reviewed the language in the regulations and researched background documents on the development of that paragraph in the regulation. FEMA then evaluated our internal guidance documents for monitoring a community's compliance with the program. Upon completion of that review, FEMA determined that our monitoring program for compliance with 44 CFR Part 60.3.a.2 was being applied too narrowly by communities.

The intent of Part 60.3.a.2 is to ensure that all necessary federal agency permits are obtained before issuance of the floodplain development permit. If the potential for a "take" exists, as defined by the ESA, then everyone (individuals, communities, agencies, etc.) is prohibited from taking that action under Section 9 of the Endangered Species Act. However, Section 10.b.2 of the ESA authorizes the USFWS and NMFS to issue a permit for a "take," under certain conditions should one be requested. Development and approval of an HCP is the typical mechanism for requesting a Section 10 permit. Therefore, if the potential of a "take" exists for a proposed development permit within the SFHA, the community has a requirement under Part 60.3.a.2 to ensure the ESA "permit for a take" has been obtained from NMFS. FEMA also

considers any Incidental Take Statement issued to federal agencies under Section 7 of the ESA to meet the requirement and intent of Part 60.3.a.2.

FEMA believes this clarification and application of the regulation do not warrant a change in the CFR or a reevaluation under NEPA. It is simply doing a better job of applying the regulations as originally designed.

In order to better implement existing regulation, all participating Oregon communities with listed species and critical habitat present within the floodplain will update existing ordinances[2] or enforceable procedures so that the following performance measures are incorporated:

1. All new development, and substantial improvements, as defined by the NFIP, will not adversely affect listed species or critical habitat within any designated floodway or Riparian Buffer Zone (RBZ).[3] The only adverse effects allowed are those developments with short-term impacts[4] associated with: (1) functionally dependent uses,[5] (2) habitat restoration activities, or (3) activities that result in a beneficial gain for the species or habitat. All short-term adverse effects associated with functionally dependent uses will be avoided, minimized, or rectified so that the long-term outcome will be neutral or beneficial for ESA-listed species and their critical habitats.
2. The RBZ is measured from the ordinary high water (OHW) of a freshwater body of water (lakes, ponds, ephemeral, intermittent or perennial)[6] or mean higher high water line (MHHW) of a marine shoreline or tidally influenced river reaches to 170 feet horizontally from the water body (170 feet from the bank on both sides of streams)[7]. For incorporated

[2] ORS 227.215 and ORS 215.416, for cities and counties, respectively, authorize cities and counties to adopt ordinances for activities that may be undertaken only in compliance with the terms of a development permit. The term "permit" does not include approval or denial of an application designed to regulate the physical characteristics of a use permitted outright (ORS 197.015). Development in the SFHA may not be an outright permitted use because 44 CFR Part 60.3(a)(1) requires cities to adopt ordinances that require a permit for all development in the SFHA. In general, permits should tie to specific standards or criteria required to grant the permit, otherwise granting the permit would require a public hearing (ORS 197.763). For this reason, cities where fish-bearing streams occur should adopt local ordinances that specifically call out the need to evaluate floodplain development for compliance with ESA in accordance with specific performance standards or criteria.

[3] RBZ is considered a management area within which a limited amount of activity may occur. This allows for some level of development as long as guidelines are followed to retain riparian functions.

[4] Short- term impacts are temporary changes occurring during or immediately following an action and usually persist for a few days, but never more than one year for most habitat functions and processes, e.g. temporary increases in turbidity, change in water temperature or water quality. (USWRC Floodplain Management Guidelines, 1978, in part)

[5] A functionally dependent use is a use that cannot perform its intended purpose unless it is located or carried out in proximity to water (e.g., piers, bridges, etc.).

[6] Ephemeral streams flow only during or immediately after periods of precipitation. They generally flow less than 30 days per year. Intermittent Streams flow only during certain times of the year, but usually more than 30 days per year. Perennial Streams flow year round, even during periods of no rainfall. Groundwater is a source of much of the water in the channel. (Federal Interagency Stream Restoration Working Group [FISRWG], 1998, page 1-16).

[7] Buffer width based on Oregon Department of Forestry (ODF) Northwest Oregon State Forests Management Plan, Integrated Forest Management Strategies, Aquatic and Riparian Strategies, 2010, page 4-64.

cities and designated urban unincorporated communities[8] outside the urban growth boundary, the types of development in the RBZ can be modified to account for the "built out" environment by complying with either A or B:

A. Conducting a programmatic habitat assessment that is scientifically based (Best Available Science (BAS)), and demonstrates that the modified RBZ will result in an improved overall conservation, protection, and appropriate restoration of riparian habitat within the spatial scale of the assessment
    1) The assessment can be conducted for the whole community;
    2) The assessment can be conducted on individual urban watershed or sub-watersheds while maintaining the standards in Performance Measure 1 for the non-assessed areas of the community;
    3) As a minimum, modification of the RBZ shall not be allowed within 50 feet of OHW[9] or MHHW.

B. Adhering to the criteria and standards for allowing site specific development modifications within the RBZ as described in Appendix E.

3. For development outside the Floodway or RBZ but in the SFHA, all adverse effects on existing floodplain functions[10] that support fish and their habitat will be mitigated so that no net loss or a net beneficial gain is achieved.

These requirements do not apply to any improvements or repairs to existing structures, including utilities, which do not exceed a 10 percent increase of a structure's existing footprint. Additionally, any development proposal that has received prior approval through an ESA Section 4d, 7, or 10 process will be considered by FEMA to be consistent with this programmatic action, and the proposal deemed compliant for purposes of abidance with 44 CFR Part 60.3.a.2 if:

A. All elements of the proposed development in the floodplain were addressed in the previously approved ESA process, including all interrelated and interdependent actions; and
B. No new information has been revealed subsequent to that approval to cause a change in the effects of the proposed development (e.g. a listing of new species or critical habitat, new data previously not available, substantial changes in the landscape(s)

[8] As defined by Oregon Administrative Code 660-022-0010 (9) and associated terminology.

[9] Based on Metro Title 3 Policy Analysis and Scientific Literature Review, no date.

[10]See FEMA Floodplain Habitat Assessment and Mitigation Guide for Oregon*: http://www.fema.gov/national-flood-insurance-program-endangered-species-act*.

2.5.3 COMMUNITY RATING SYSTEM

No new changes are being proposed for the CRS, as FEMA believes that maximum discretion was taken to address ESA species and critical habitat through the Washington state consultation. Those changes are being implemented on a nationwide basis and will be fully in effect in March 2013.

2.5.4 FLOODPLAIN MITIGATION ACTIVITIES

FEMA will provides technical assistance to Oregon communities by responding to questions, to the extent practicable, that are posed by jurisdictions about how they will likely need to be compliant with the ESA under the upcoming NMFS BO for the NFIP in Oregon. Currently, the Oregon Department of Land Conservation and Development (DLCD) is hosting meetings in 2012-2013 to provide information on these and other related topics. FEMA provides the funding for the DLCD staff time to facilitate these meetings, and staff from NMFS and FEMA attend some of the meetings to field questions.

FEMA will provide regional guidance documents on a NFIP ESA internet site (http://www.fema.gov/national-flood-insurance-program-endangered-species-act) that can assist jurisdictions in understanding what options they have in order to abide by the ESA under the NFIP in Oregon. This site includes the Floodplain Habitat Assessment and Mitigation guidance for Oregon, any necessary technical memos on clarifications on the NFIP Consultation in Oregon, and links to other sources of information that may be of assistance. The Floodplain Habitat Assessment and Mitigation guidance document will assist jurisdictions in Oregon with completing programmatic habitat assessments to document compliance with the ESA and the BO for the NFIP in Oregon. This guidance includes a description of the general content that should be included in a habitat assessment, examples of possible formats to use for the assessment, and links to other documents and information that could assist communities in the preparation of assessments. It also includes a list and description of the key habitat functions and processes that may be impacted by some land development actions. Habitat assessments need to describe current baseline conditions relative to these functions and how the proposed action will affect each function in order to adequately assess possible impacts to ESA-listed species and designated critical habitats.

FEMA will offer public workshops, contingent upon available funding, in multiple locations around Oregon after the BO is issued in order to provide information on how communities can complete programmatic habitat assessments to document compliance with the ESA.
FEMA will require local communities to log floodplain development activities, assess the impacts using the current tools available, and mitigate for any identified adverse effects for those project action categories that allow there to be any mitigated, limited adverse effects (see Section 2.5.2 above). Mitigation must occur at the time of permitting by the local jurisdiction to be effective. FEMA will also continue to work closely with NMFS to help local community

officials understand how to review habitat assessments, and how ESA "effects determination" are made, since the staff of many jurisdictions have limited experience with ESA consultations.

2.5.5 MONITORING AND ADAPTIVE MANAGEMENT

FEMA Region X conducts CAVs and CACs with communities that participate in the NFIP. FEMA Region X will use available reports, LOMR-Fs, repetitive loss statistics, and potential violations to prioritize monitoring. In determining the priority for conducting CAVs, FEMA Region X will consider the presence of species, along with other risk factors, as part of the selection criteria. FEMA Region X will also change its Community Assistance Program – State Support Services Element (CAP-SSSE) funding guidelines to require DLCD to assist FEMA Region X with its monitoring of communities for ESA compliance.

FEMA Region X will engage with the USACE, Portland Office and the DSL for the opportunity to be included in the Joint Permit Application (JPA) review process as a means of sampling and reconciling floodplain activities for conducting compliance activities with communities.

Communities that fail to implement the requirements of 44 CFR Part 60.3(a)(2), as described above, will be subject to FEMA Region X enforcement actions. The FEMA Region X process for enforcement under 44 CFR Part 60.3(a)(2) would fall under the criteria of "failure to enforce the local floodplain ordinance" and result in a CAV to determine the circumstances and identify corrections to violations. Violations resulting in the loss of habitat or potential take of a species will result in a notification to NMFS for appropriate ESA enforcement action.

FEMA Region X will proceed with program enforcement as described previously. Upon placing a community on probation, FEMA Region X will notify NMFS of all actions taken by FEMA Region X to correct program deficiencies and violations, the remedy for the deficiencies and violations, and will request NMFS to take appropriate enforcement actions under its authority. If NMFS notifies FEMA Region X that no enforcement action will be taken by NMFS on the parcel at issue, FEMA Region X will determine whether to continue probation for the community. Should NMFS pursue the enforcement action, FEMA Region X will continue the community's probation until the program deficiencies are resolved or NMFS concludes the enforcement action.

FEMA Region X will provide NMFS with a report on any CAVs that identify potential violations of the proposed performance measures. The report will include the nature of the potential violation, any actions required to remedy the potential violation, and the actions taken by the community for compliance.

Components of the Puget Sound Biological Opinion in Washington are compared to this Proposed Action in Oregon in Table 2.5-1. All other elements of the NFIP in Oregon will remain the same.

Table 2.5-1. Crosswalk of Puget Sound Biological Opinion to Oregon Proposed Action.

Washington Puget Sound RPA	Oregon Proposed Action
RPA Element 2 - Mapping	
Letters of Map Change	Same, except applied nationally under Procedure Memorandum 64
Prioritize mapping with consideration to listed species	Same
Provide Modeling Guidance: 2 Dimensional	Provide Modeling Guidance: 2 Dimensional and Unsteady State
RPA Element 3 – Minimum Floodplain Management Requirements	
Prohibit development in Floodway, Riparian Buffer Zone, Channel Migration zone	Not in Proposed Action
No adverse effects in Floodway, Riparian Buffer Zone of up to 250 ft, Channel Migration Zone	Limit activities within Floodway and Riparian Buffer Zone of up to 170 ft with all associated adverse effects mitigated
Prohibit development in 100-year floodplain	Not in Proposed Action
All adverse effects in floodplain mitigated	All adverse effects in floodplain mitigated
Improvements/repairs to existing structures resulting in greater than 10% footprint increase will mitigate adverse effects	Improvements/repairs to existing structures, including utilities, not exceeding 10% footprint increase are allowed.
RPA Element 4 - CRS	
Elements A-I	Same, except applied nationally
RPA Element 5 Levee Vegetation	
Use and encourage Flood Mitigation Assistance Program and Hazard Mitigation Grant program to reduce risk and benefit salmon	Not in Proposed Action
RPA Element 6 Floodplain Mitigation	
Mitigation for interim period	Same
RPA Element 7 Monitoring and Adaptive Management	
Progress reporting to NMFS annually	Progress reporting to NMFS annually
	Prioritization of monitoring based upon fill activities, Joint Permit Applications (JPA), repetitive loss activities
	Incorporation into JPA process

2.6 IMPLEMENTATION SCHEDULE

Based on the lessons learned regarding implementation of the NFIP in Washington state, FEMA assumes that a similar timeframe of a 4-year period will be required for program implementation in Oregon. During this time, FEMA will be focusing on two fronts – dealing with changes for its internal processes, and assisting local communities with the new requirements. Several of the

internal FEMA changes (e.g., mapping priorities, modeling, and CRS) are already implemented on a national scale.

Based upon progress in Washington state, the first 2 years of implementation will focus on education and outreach so the communities will be able to fully understand the requirements to make the appropriate changes to their local regulations. The remaining 2 years will focus on complying with state-required processes for amending ordinances, along with continued outreach and technical assistance by FEMA, NMFS, and DLCD. The expectation is that communities will come into compliance on various schedules and that the timeline should not be considered a strictly sequential process.

FEMA will utilize NMFS assistance in establishing the priorities for bringing individual communities into compliance assuming that the priorities will be based upon fish recovery efforts or most vulnerable populations. FEMA, with assistance from DLCD, will then focus efforts on those communities first.

FEMA has already notified communities of their responsibility to comply with the ESA via the standards set forth in 44 CFR Part 60.3, Section a.2. In general, this will require communities to either: (1) prohibit all NFIP-related actions in the SFHA during the implementation phase, or (2) determine the presence of fish or critical habitat and assess the permit application for potential impacts to species and habitat. Communities will require any such actions with potential adverse affects to be fully mitigated with no net loss of habitat function.

Reporting requirements, until full implementation by all affected communities, will be worked out with NMFS during formal consultation.

2.7 ACTION AREA

The Action Area for this analysis includes the geographic range of the ESUs and distinct population segments (DPSs) for the following:

- Chinook – Lower Columbia River
- Chinook – Snake River Spring/Summer-run
- Chinook – Snake River Fall-run
- Chinook – Upper Willamette River (Spring-run)
- Coho – Lower Columbia River
- Coho – Oregon Coast
- Coho – Southern Oregon-Northern California
- Steelhead – Lower Columbia River
- Steelhead – Middle Columbia River
- Steelhead – Snake River Basin
- Steelhead – Upper Willamette River
- Chum – Columbia River

- Green Sturgeon
- Eulachon

In addition, the lower and middle sections of the Columbia River are used as a travel corridor by Upper Columbia steelhead and Chinook salmon, so these species are considered a part of the analysis by default.

3.0 Existing Conditions

3.1 INTRODUCTION

This section of the PLBA presents the basic distribution of listed salmon, steelhead, green sturgeon, and eulachon within Oregon and the example communities. An extensive amount of information is available for the salmonids; relatively less information (but still substantial) is available for the sturgeon and eulachon. Because of this and the programmatic nature of this PLBA, the descriptions focus on the species at the ESU-level and are kept brief. The bulk of species-specific information is incorporated by reference.

Watershed conditions for each of the example watersheds are described in slightly more detail, and the presence, distribution, and status of the listed fish are described as appropriate along with limiting factors, and available water quality information.

3.2 SALMON AND STEELHEAD

This description considers four species of salmon and steelhead, which are divided up into 12 different distinct populations in Oregon (Table 3.2-1). Language in the ESA indicates that a species is considered to be "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." It is from this language that the concept of a distinct population segment (DPS) arose. If a stock of salmon: (1) is substantially reproductively isolated from other nonspecific reproductive units; and (2) represents an important component in the evolutionary legacy of the species, NOAA Fisheries considers that stock to be an ESU and therefore a species under the ESA (56 FR 58612). NOAA Fisheries considered salmon populations in terms of ESU concept and steelhead in terms of DPS. A detailed discussion for the reasoning behind this is presented in the 2006 steelhead listing notice (74 FR 834). These two terms are used in the same manner as NOAA Fisheries throughout this PLBA.

In the species-specific discussion that follows, the basic life cycle biology is presented first for a given species followed by any major differences between the various ESUs as it would relate to the NFIP program.

Basic Life Cycle. All of these species are anadromous, meaning that they hatch in freshwater, migrate to the ocean to mature, and return to freshwater as adults to spawn. Spawning occurs in gravel riffles where larger fish (e.g., Chinook) typically use larger substrates than smaller fish (e.g., steelhead). The eggs incubate for a varying amount of time in gravels before hatching based primarily on water temperature. The young fish spend different amounts of time in freshwater, depending on the species before migrating to the ocean where they spend 1–4 years

before returning to spawn. Most salmonids die after spawning; steelhead are the exception to this, with some adult survival and repeat spawning.

Excellent references on the life-cycle of salmon and steelhead are plentiful. Although somewhat California-specific, Moyle (2002) provides a detailed description of life-cycle patterns of Chinook, coho, steelhead, and chum salmon. Detailed ESU-specific descriptions are provided in the Federal Register listing notices (Table 3.2-1) and in status reviews conducted by NOAA Fisheries and the ODFW (e.g., Weitkamp et al. 1995; McElhany et al. 2007; and Good et al. 2005). Because this information is readily available, it is incorporated in this PBLA by reference. The only descriptions of different life cycles are presented below to clarify different run-components of an ESU (e.g., the difference between spring and summer-run Chinook on the Snake River).

Table 3.2-1. Salmon ESU and Steelhead DPS and Listing Status.

ESU/DPS	Listing Status (FR Citation)	Critical Habitat Status (FR Citation)
Chinook – Lower Columbia River	Threatened (70 FR 37160)	Designated (70 FR 52630)
Chinook – Upper Columbia River Spring Run[1]	Endangered (70 FR 37160)	Designated (70 FR 52630)
Chinook – Snake River Spring/Summer-run	Threatened (70 FR 37160)	Designated (64 FR 57399)
Chinook – Snake River Fall-run	Threatened (70 FR 37160)	Designated (58 FR 68543)
Chinook – Upper Willamette River (Spring-run)	Threatened (70 FR 37160)	Designated (70 FR 52630)
Coho – Lower Columbia River	Threatened (70 FR 37160)	Under Development
Coho – Oregon Coast	Threatened (73 FR 7816)	Designated (73 FR 7816)
Coho – Southern Oregon-Northern California	Threatened (70 FR 37160)	Designated (64 FR 24049)
Steelhead – Lower Columbia River	Threatened (71 FR 834)	Designated (70 FR 52630)
Steelhead – Middle Columbia River	Threatened (71 FR 834)	Designated (70 FR 52630)
Steelhead – Upper Columbia River[1]	Threatened (74 FR 42605)	Designated (70 FR 52630)
Steelhead – Snake River Basin	Threatened (71 FR 834)	Designated (70 FR 52630)
Steelhead – Upper Willamette River	Threatened (71 FR 834)	Designated (70 FR 52630)
Chum – Columbia River	Threatened (70 FR 37160)	Designated (70 FR 52630)

[1.] Upper Columbia ESU for Chinook and DPS for steelhead do not occur in Oregon; however, they are included in the analysis because the species use the Lower Columbia River as a travel corridor and could be affected by floodplain actions.

3.2.1 CHINOOK SALMON

Chinook salmon are the largest salmon found in Oregon streams. Spawning adults can weigh up to 30 kilograms (kg) and reach lengths over 1 meter, but 70 centimeter (cm) and weights around 6–12 kg are more common (Moyle 2002). There are four ESUs of Chinook within Oregon (Figure 3.2-1). Each of the ESUs addressed in the PLBA has a slightly different life-history pattern (Table 3.2-2). Within each of these ESUs, there are variations because in some cases, like the Lower Columbia ESU, spring and full-run fish have been combined into a single ESU. Upper Columbia Chinook are included in the analysis, but this species' ESU does not occur in Oregon. This population uses the lower Columbia River as a travel corridor and could be affected by floodplain actions.

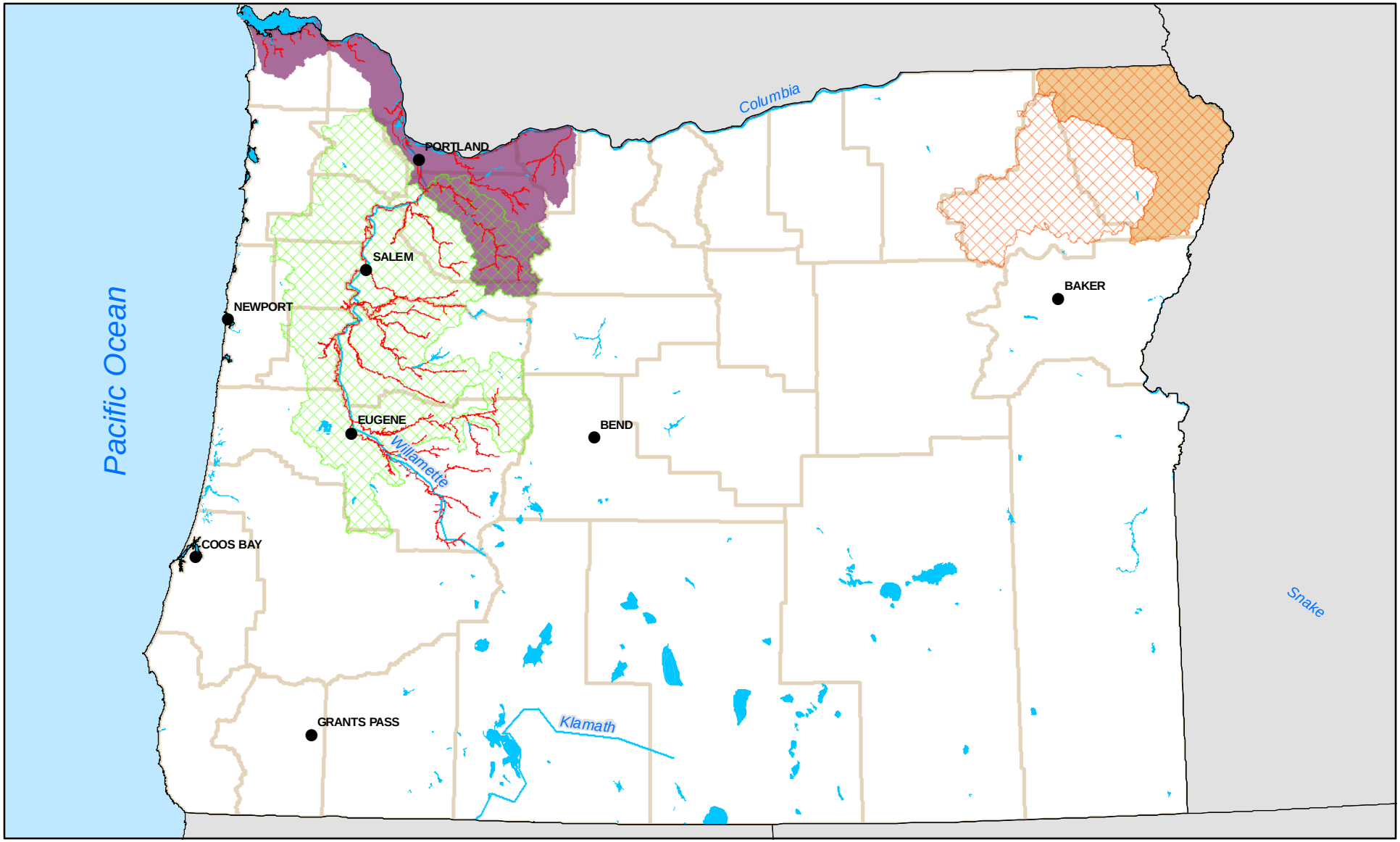


Figure 3.2-1. Chinook Salmon Evolutionary Significant Units and Designated Critical Habitat in Oregon
Oregon NFIP Program Level Biological Assessment

* Critical Habitat has been designated for Snake River ESUs, but spatial data is not available.

Evolutionarily Significant Units
- Lower Columbia River
- Snake River Fall
- Snake River Spring/Summer
- Upper Willamette River

- Chinook Distribution
- Designated Critical Habitat

- Open Water/Ocean
- Major Rivers

Sources: NOAA Fisheries, ODFW

N

0 50 100 Miles

File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-2-1_Chinook_ESU.mxd

Print Date: July 11, 2011

Table 3.2-2. Typical Life-cycle Timing for Chinook Salmon ESUs in Oregon.

ESU	Adult Freshwater Entry	Spawning	Incubation	Freshwater Rearing	Outmigration	Source
Lower Columbia	Mid-Aug	Aug–Sep	Fall–Winter	Sep–Mar	Spring	McElhany et al. 2007
Snake River Spring/Summer-run	Mar-Aug	Aug–Sep	Fall–Winter	12 months	Spring of second year	Good et al. 2005
Snake River Fall-run	Jul–Aug	Oct–Dec	Oct–Apr	Mar–May	Jun–Fall	Good et al. 2005
Upper Willamette River Spring-run	Jan–Apr, over Willamette Falls Apr–Aug	Aug–Oct	Aug–Dec	12–14 months	Winter–Spring	Beamesderfer et al. 2010

Lower Columbia River ESU

The Lower Columbia River ESU encompasses naturally spawning populations of Chinook from the mouth of the Columbia River upstream to the Hood River on the Oregon side (Figure 3.2-1). This includes the Willamette River and its tributaries up to the Willamette Falls. The threatened status of this ESU was re-affirmed on June 28, 2005 (70 FR 31760). Critical habitat has been designated for this ESU (Figure 3.2-1; 70 FR 52630).

This ESU contains several different sub-populations of Chinook. According to McElhany et al. (2007), on the Oregon side of the river it includes:

- Fall-run populations in Youngs Bay, Big Creek, and the Clatskane, Scappoose, Clackamas, Sandy, Lower Gorge, and Hood rivers.
- A late-fall-run population in the Sandy River.
- A spring-run population in the Sandy and Hood rivers.

All of these naturally reproducing populations are reported as severely depressed compared to historic levels. In their stock assessment of Oregon, McElhany et al. (2007) concluded that all the Lower Columbia River stocks within the ESU were at a high risk of extinction, except those in the Sandy River where the late-fall run was considered at low risk and the spring-run was a moderate risk.

Snake River Spring/Summer-run ESU

The Snake River spring/summer-run ESU includes all naturally spawning populations in the mainstem Snake River and major tributaries (Figure 3.2-1). This ESU also includes 15 artificial propagation programs. The threatened status of this ESU was re-affirmed on June 28, 2005 (70

FR 31760). Critical habitat was revised and designated for this ESU in 1999 (Figure 3.2-1; 64 FR 57399). A recovery plan is being prepared for this ESU but is not yet available.

The number of returning fish in this ESU has been reduced since the 1960s (70 FR 31760). Returns increased dramatically in 2001, but the value of this to the overall naturally spawning population is unclear because almost 80 percent of the fish were of hatchery origin (Good et al. 2005).

Spring-run Chinook are those that pass Bonneville Dam in early March through the first week in June; summer-run are Chinook that return from June through August (Good et al. 2005). All of these fish hold in mainstem pools until late summer before migrating into the tributaries to spawn. The spring-run spawns higher in the basin than do the summer-run (Good et al. 2005).

Snake River Fall-run ESU

The Snake River fall-run ESU includes all naturally spawning populations in the mainstem Snake River downstream of Hells Canyon Dam and major tributaries including the Grande Ronde, Clearwater, Tucannon, and Imnaha basins (Figure 3.2-1). This ESU also includes four artificial propagation programs. The threatened status of this ESU was re-affirmed on June 28, 2005 (70 FR 31760). Critical habitat was designated for this ESU in 1993 (58 FR 68543) and reaffirmed in 2005 (Figure 3.2-1; 70 FR 52630). A recovery plan has not been prepared for this ESU.

The current population of Snake River fall-run Chinook is apparently larger than when stock assessments were conducted prior to listing in previous years, but according to Good et al. (2005) this is attributed to larger releases of hatchery-raised fish and increases in ocean survival. Regardless, the population remains below the delisting criteria of an 8-year average of 2,500 natural spawners (Good et al. 2005). Natural spawning is limited to an area between the upstream end of Lower Granite Reservoir and Hells Canyon Dam along with the lower reaches of the Grande Ronde, Clearwater, Tucannon, and Imnaha rivers (Good et al. 2005).

Upper Willamette River Spring-run ESU

The population of Chinook classified into the Upper Willamette River Spring-run ESU was listed as threatened, a status that was re-affirmed on June 28, 2005 (70 FR 31760). Critical habitat has been designated for this ESU (Figure 3.2-1; 70 FR 52630). This ESU includes all naturally spawned Chinook in the Clackamas River and the Willamette River upstream of the Willamette Falls and their tributaries. Seven artificial propagation programs are considered to be part of this ESU. Adult Chinook in this ESU enter the Columbia River in January through April, passing over Willamette Falls between April and August (Table 3.2-2), reaching spawning areas in late summer through early fall.

When the first status review of this ESU was conducted in 1998, there was only one naturally spawning population (McKenzie River), and there was concern about the level of hatchery supplementation and the degree of interaction (Myers et al. 1998). Good et al. (2005) provides an update on the overall population viability of this ESU. The only natural-origin population that remains is in the McKenzie River; with adult returns in the 1,000s, this population remains at risk of extinction.

3.2.2 COHO SALMON

Coho salmon are smaller than Chinook with returning adults averaging about 4 kg and between about 45 and 70 cm in length (Laufle et al. 1986; Weitkamp et al. 1995). Coho are often characterized as a short-run fish that primarily use smaller tributaries to large river. There are three ESUs of coho within Oregon that are addressed in this PLBA: Lower Columbia, Oregon Coast, and Southern Oregon-Northern California (Table 3.2-3; Figure 3.2-2). All three are considered threatened under the ESA, and critical habitat has been developed for all but the Lower Columbia River ESU.

Table 3.2-3. Typical Life-cycle Timing for Coho Salmon ESUs in Oregon.

ESU	Adult Freshwater Entry	Spawning	Incubation	Freshwater Rearing	Out-migration	Source
Lower Columbia	Aug–Oct Dec-Feb	Sep–Oct Nov–Jan	Mar–July	18 months	Apr–June	Johnson et al. 1991
Oregon Coast	Sep–Oct	Oct–Feb	Oct–Mar	12 months	Feb–June	Weitkamp et al. 1995
Southern Oregon-Northern California	Sep–Oct	Nov–Feb	Nov–Mar	12 months	Feb–June	Weitkamp et al. 1995

Lower Columbia River ESU

The Lower Columbia River ESU for coho includes all naturally spawning populations in the Columbia River and its tributaries (including the Willamette River to Willamette Falls) and the Big White River and Hood River (Figure 3.2-2; 70 FR 37160). This listing also includes 25 artificial propagation programs. Critical habitat is currently being developed for this ESU.

In a stock review conducted in 2001, NOAA Fisheries determined that over 90 percent of historic populations of coho in the Lower Columbia had been extirpated. The only rivers with self-sustaining populations were the Sandy and Clackamas rivers. However, these two populations were considered to be at risk because of low populations, declining numbers of returning adults, and several other factors (NMFS 2001). Large numbers of hatchery fish were also a concern in the 2001 assessment, and they continue to dominate the Lower Columbia ESU (Good et al. 2005). Good et al. (2005) concluded that the only two populations with natural production were those in the Clackamas and Sandy rivers, with all other naturally spawning populations dominated by hatchery-origin fish and unlikely to persist if supplementation were curtailed.

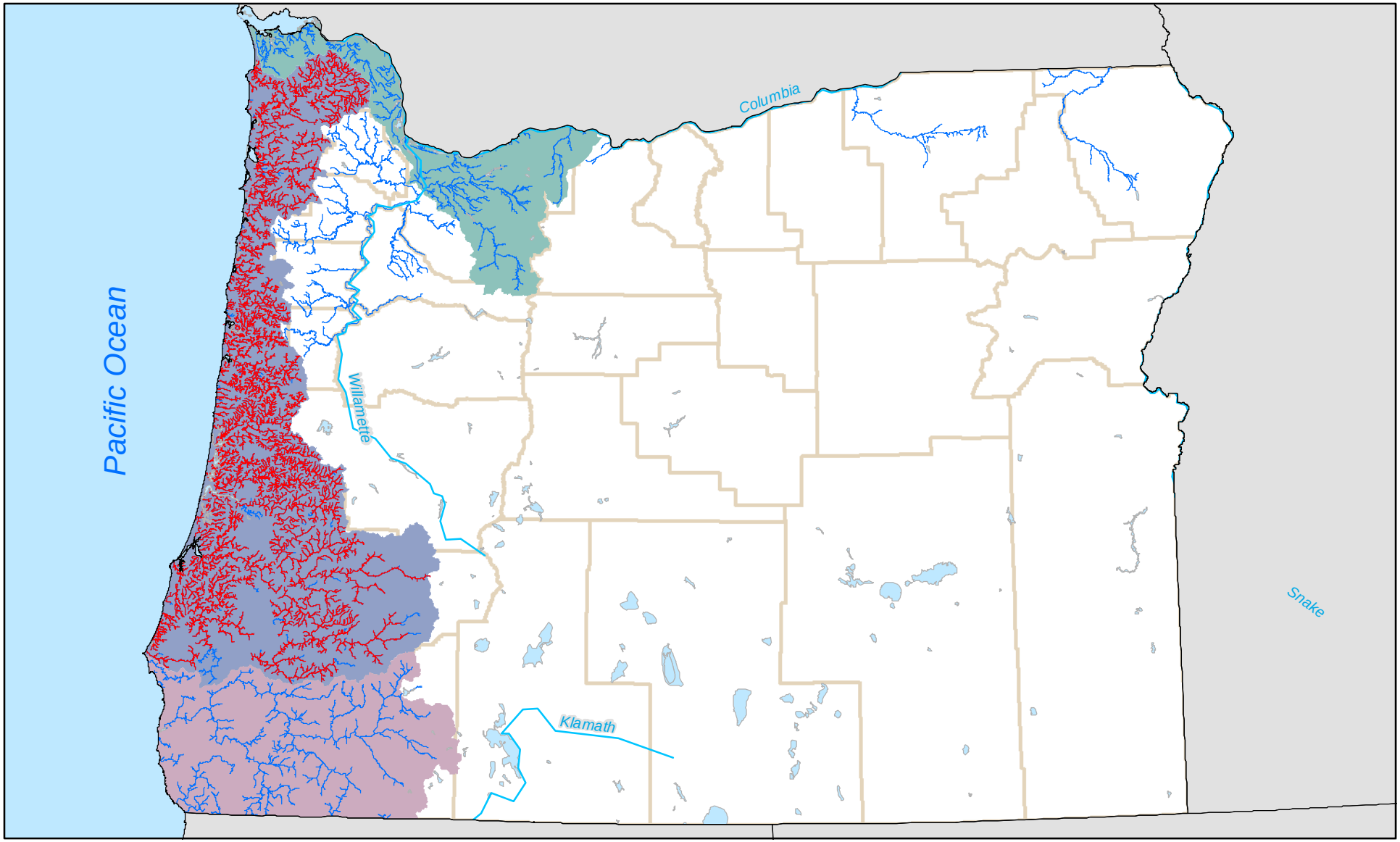


Figure 3.2-2. Coho Salmon Evolutionarily Significant Units and Designated Critical Habitat in Oregon
Oregon NFIP Program Level Biological Assessment

Evolutionarily Significant Units
- Lower Columbia River
- Oregon Coast
- Southern Oregon/Northern California Coasts*

- Coho Distribution
- Designated Critical Habitat*
- Open Water/Ocean
- Major Rivers

Sources: NOAA Fisheries, ODFW

* Critical Habitat has been designated for Southern Oregon/Northern California Coasts Coho Salmon ESU, but spatial data is not available.

N

0 50 100 Miles

File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-2-2 Coho ESU.mxd

Print Date: July 11, 2011

More recently, McElhany et al. (2007) reported a resurgence of wild coho spawning in the Clackamas and Sandy rivers, but also in the Scappoose and Clatskanie rivers where they had been essentially non-existent for a decade. Regardless of this population surge, they determined that the only population that was likely viable was the Clackamas River population; all the other populations were at high risk of extinction (McElhany et al. 2007).

Oregon Coast ESU

The coho Oregon Coast ESU extends from south of the Columbia River to Cape Blanco and includes all naturally spawning populations within that stretch of coast (Figure 3.2-2; 73 FR 7816). This ESU was listed as threatened on February 11, 2008 and the listing was retained in 2011 (76 FR 35755). Critical habitat was designated at the same time as the original listing in 2008.

In the 1991 stock review for the Oregon Coast ESU, Weitkamp et al. (1995) noted that wild coho populations had been reduced by about 90 percent from historic levels. About half of this decline was attributed to habitat that was unsuitable to support fish. While noting the great amount of uncertainty, they concluded that if the trend continued, recruitment could fall below replacement levels even if harvest was completely stopped (Weitkamp et al. 1995). The Oregon Fish and Wildlife Commission adopted the Oregon Coast Coho Conservation Plan in March of 2007 (ODFW 2007). The 2008 annual report for the conservation plan indicates that returning adults were more abundant in 2008 than since 2002, but still well below the goal set in the plan (ODFW 2009).

Run timing and spawning vary quite a bit for the runs within this ESU. The southern fish tend to enter streams a little later than the northern runs. Differences in run timing correlate with differences in spawning timing, time to emergence, and freshwater residency. A good summary of run timing in the different streams can be found in Weitkamp et al (1995) and Nickelson (2001).

Southern Oregon-Northern California ESU

The Southern Oregon-Northern California ESU extends from Cape Blanco, Oregon to Punta Gorda, California (Figure 3.2-2). The listing was reaffirmed in 2005 and includes all naturally spawning populations within this area and three artificial propagation programs; the Cole River Hatchery is the only program in Oregon (70 FR 37160). The two main rivers in Oregon within this ESU are the Rogue and Chetco rivers; many other smaller coastal streams also support coho. Critical habitat has been designated for this ESU and includes all those streams accessible to listed coho between Cape Blanco and the Oregon state line (64 FR 24049).

The discussion of the Oregon coho within the Southern Oregon-Northern California ESU relies heavily on the population in the Rogue River. This is simply because this is the largest Oregon

stream in the ESU, and this population has been the most intensively studies over the years. In the first stock assessment, Weitkamp et al. (1995) concluded that coho in this ESU were likely to become endangered in the near future. Not much had changed when the 1997 review was conducted, and the conclusion was that coho in this ESU remained in danger of becoming endangered in the foreseeable future (Good et al. 2005). Trends in naturally produced spawning fish have been upward, but the true status of coho in the Rogue River continues to be complicated by the presence of naturally spawning hatchery fish (Good et al. 2005).

3.2.3 STEELHEAD

Steelhead exhibit perhaps the most diverse life-history patterns of any salmonid (Table 3.2-4). The term "steelhead" is applied to *Oncorhynchus mykiss* that have spent at least several months in the ocean. Rainbow trout, also *O. mykiss*, spend their entire lives in freshwater. NOAA Fisheries only considers the anadromous forms in their listings; therefore, this PLBA considers only steelhead. The reasoning behind this decision is described in the 2005 listing notice for steelhead (74 FR 834). Upper Columbia steelhead are included in the analysis, but this species DPS does not occur in Oregon. This population uses the lower Columbia River as a travel corridor and could be affected by floodplain actions.

Table 3.2-4. Typical Life-cycle Timing for Steelhead DPSs in Oregon.

DPS	Adult Freshwater Entry	Spawning	Incubation	Freshwater Rearing	Out-migration	Source
Lower Columbia River	Nov–Mar (WR) Jun–Oct (SR)	Dec–May (WR) Jan–Jun (SR)	Dec–Jun (WR) Jan–Jun (SR)	1–2 years	Sep–Jun	LCFRB 2004
Middle Columbia River	Jun–Oct	Mar–May				Good et al. 2005
Snake River Basin	Jun–Oct	Mar–May				Good et al. 2005
Upper Willamette River	Jan–Apr Feb–May (Willamette Falls)	Mar–Jun	Mar–Aug	1–4 years, 2 most common	Apr–May	Beamesderfer et al. 2010

WR – winter run; SR = summer run.

Lower Columbia River DPS

The Lower Columbia River DPS includes all naturally spawned steelhead in the mainstem and tributaries from the mouth of the Columbia River upstream to and including the Hood River on the mainstem and to Willamette Falls on the Willamette River (Figure 3.2-3). Ten propagation programs are included within this DPS, only four of which (Clackamas and Sandy rivers and two stocks on the Hood River) are in Oregon. Critical habitat was designated for this DPS in September 2005 (70 FR 52630) and includes Primary Constituent Elements (PCEs) such as freshwater spawning and rearing sites, freshwater migration corridors, estuarine areas, and nearshore and offshore marine areas, all of which are necessary for the conservation of steelhead.

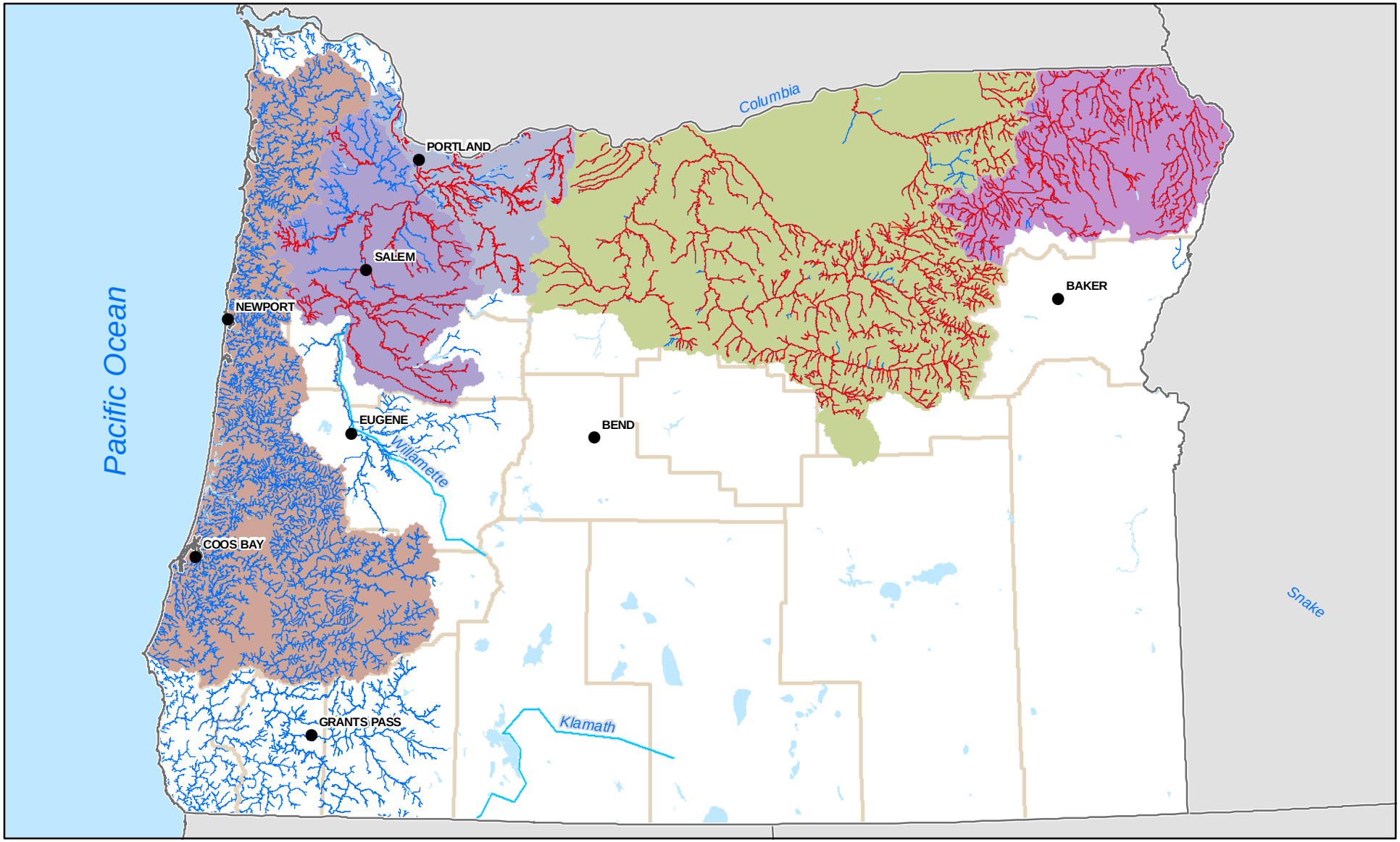


Figure 3.2-3. Steelhead Distinct Population Segments and Designated Critical Habitat in Oregon

Oregon NFIP Program Level Biological Assessment

Sources: NOAA Fisheries, ODFW

Distinct Population Segments

- Upper Willamette River
- Snake River Basin
- Oregon Coast
- Upper Columbia River
- Middle Columbia River
- Lower Columbia River
- Designated Critical Habitat
- Steelhead Distribution
- Open Water/Ocean
- Major Rivers

N

0 50 100 Miles

File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-2-3_Steelhead ESU.mxd

Print Date: July 11, 2011

Previous reviews concluded that this DPS was likely to become endangered in the foreseeable future due to a combination of factors, including widespread intermingling of hatchery and wild fish, substantial declines in abundance, and potential adverse effects on native winter-run from introduced summer-run steelhead. Only the Hood River in Oregon supported a native summer-run of steelhead in this DPS (Good et al. 2005). Good et al. (2005) concluded that many of the populations in this DPS are likely sustained by hatchery-origin fish. Overall, the 2005 review concluded that the populations within this DPS were likely to become endangered and that all of the risk factors identified in previous reviews remained (Good et al. 2005).

Middle Columbia River DPS

This threatened DPS includes all naturally spawned populations upstream of the Hood River to the Yakima River, Washington, not including the Snake River (see below) (Figure 3.2-3). Six propagation programs are included in this listing, only two of which (Umatilla and Deschutes rivers) are in Oregon. Critical habitat was designated for this DPS in September 2005 (70 FR 52630) and includes PCEs such as freshwater spawning and rearing sites, freshwater migration corridors, estuarine areas, and nearshore and offshore marine areas, all of which are necessary for the conservation of steelhead. The major Oregon streams that support Middle Columbia River DPS steelhead are the Umatilla River, John Day River, Deschutes River, upper Walla Walla River, Fifteen Mile Creek, and numerous smaller tributaries to these streams, and the Columbia River.

These fish are almost all summer-run steelhead that enter the Columbia River in the late summer and fall. A winter-run that returns to Fifteen Mile Creek is included in this DPS. Hatchery production and straying of hatchery fish in the Yakima and Deschutes rivers along with habitat degradation and water quality concerns (primarily temperature) were identified as areas of concern in previous assessments (61 FR 41541). More recent trend data reported in Good et al. (2005) indicate that some stocks had 5-year average returns that were higher than previous years (e.g., Yakima River, Umatilla River), while other stocks were lower (e.g., upper and lower mainstem John Day River). However, even though the Yakima population was reported as increasing, it is still well below recovery targets. The latest review concluded that this DPS was likely to become endangered (Good et al. 2005).

Snake River Basin DPS

Steelhead in this DPS include all naturally spawned fish upstream of the confluence with the Columbia River to impassable barriers (Figure 3.2-3). This DPS includes six propagation programs, only one of which (Imnaha River Hatchery) is in Oregon. Critical habitat was designated for this DPS in September 2005 (70 FR 52630) and includes PCEs such as freshwater spawning and rearing sites, freshwater migration corridors, estuarine areas, and nearshore and offshore marine areas, all of which are necessary for the conservation of steelhead. The major

streams in Oregon that support Snake River Basin DPS steelhead are the Imnaha River, upper Grande Ronde River, Joseph Creek, and numerous smaller tributaries.

Steelhead in this DPS migrate an extremely long distance from the mouth of the Columbia River to holding and spawning areas in the tributaries to the Snake River. These are summer-run fish that enter the river in late summer and fall, and overwinter near their spawning grounds before spawning the following spring. Unfortunately, data on returns of adult fish to specific areas occupied by this DPS are not available. An upward population trend was reported by Good et al. (2005) for the DPS based on counts at Lower Granite Dam through 2001; however, a large component of the run was hatchery origin fish. The 2005 status review concluded that this DPS was likely to become endangered, but this determination is made less certain by incomplete information on adult escapements and interactions with resident fish (Good et al. 2005).

Upper Willamette River DPS

This DPS includes all naturally spawning steelhead populations from the Willamette Falls upstream to and including the Calapooia River (Figure 3.2-3). No artificial propagation programs are included within this DPS. Critical habitat was designated for this DPS (70 FR 52630) and includes a variety of tributary and mainstem habitat from the mouth of the Columbia River in the Pacific Ocean upstream to headwaters on smaller creeks in the Coast and Cascade Mountain ranges (Figure 3.2-3). This designation includes all the PCEs previously listed for the other steelhead populations. The major streams that support steelhead in this area include the Willamette River and all its forks; the Clackamas, McKenzie, Santiam, Molalla, and Calapooia rivers; and a host of minor tributaries.

While the 2005 status review concluded that this DPS was likely to become endangered, no specific critical risks to the population were identified (Good et al. 2005). The review noted that while returning adults were more common in 2001 and 2002, overall abundance for the DPS remained relatively low. However, even though the populations are lower than historically present, all of the populations remain in existence and produce what are described as “moderate” numbers of wild steelhead (McElhany et al. 2007).

3.2.4 Columbia River Chum Salmon

Only one population of chum salmon is afforded protection under the ESA within Oregon. The Columbia River ESU was listed as threatened in June 2005 (70FR 37160), and critical habitat was designated in September 2005 (70 FR 52630). This ESU includes all naturally spawned populations within Oregon and Washington (Figure 3.2-4).

Based on general information presented by Lower Columbia Fish Recovery Board (LCFRB 2010), adult chum enter the Columbia River in October through November and quickly move onto spawning grounds.

Figure 3.2-4. Chum Salmon Evolutionary Significant Units and Designated Critical Habitat in Oregon
Oregon NFIP Program Level Biological Assessment

Evolutionarily Significant Units
Columbia River
Designated Critical Habitat
Chum Distribution
Open Water/ Ocean
Major Rivers

Sources: NOAA Fisheries, ODFW

N

0 50 100 Miles

File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-2-4_Chum_ESU.mxd

Print Date: July 11, 2011

Spawning begins as early as October in lower river locations and continues through December, with eggs remaining in the gravel through February and March. Emergence and rearing take place in February and March, with migration to the ocean largely completed by the end of May. Populations on the Oregon side of the Columbia River appear to be limited to the Columbia River itself (Kostow 1995).

The Columbia River once supported a large run of chum salmon, with millions of pounds of fish landed in an in-river commercial fishery (Johnson et al. 1997). By the mid-1950s, the number of returning fish had plummeted to around 4,000 fish and continued to decline through the late 1970s (Johnson et al. 1997). Returns have been somewhat stable since the 1970s at a few thousand fish per year (Good et al. 2005) but are a fraction of what they once were. The only extant population of chum in the Oregon portion of the Columbia River ESU is found in the lower gorge tributaries. These fish spawn in both the mainstem Columbia River near Multnomah and Ives islands downstream of Bonneville Dam (Good et al. 2005). Their numbers have declined since the 1950s, and all other Oregon populations are considered extirpated (Good et al. 2005).

3.3 GREEN STURGEON

The southern DPS of green sturgeon is listed as threatened and includes green sturgeon south of the Eel River, California (71 FR 17757). The only known spawning in this DPS is found in the Sacramento River. Oregon-spawning sturgeon are part of the northern DPS and are not afforded protection under the ESA but are considered a species of concern. Critical habitat was proposed for the southern DPS in 2008 (73 FR 52084). Even though green sturgeon in Oregon were not listed, designated critical habitat includes portions of the lower Columbia River, Coos Bay, Winchester Bay, and Yaquina Bay (Figure 3.3-1); Tillamook Bay and the Rogue, Alsea, and Suislaw rivers to the head of tidewater were specifically excluded from critical habitat (74 FR 52300)

Green sturgeon are a long-lived anadromous fish. Adults migrate from the ocean to spawning locations in freshwater starting in February with spawning likely occurring in March to June (NMFS 2009). In Oregon, spawning is known from Rogue River (NMFS 2009) but is also reported as infrequently occurring in the Umpqua River (NMFS 2005). Spawning locations and behavior are not well understood or documented, but are believed to take place at the transition from riffles to deep pools over cobble and boulder substrate (NMFS 2009). Eggs are adhesive and hatch in 6–9 days depending on water temperature. Larval green sturgeon appear to be bottom-oriented and gradually move downstream into rearing habitats as they mature. The period of freshwater residency is not well understood for green sturgeon. Juveniles are capable of surviving in brackish water at almost any age, but survival in seawater is apparently not high until after about 18 months (NMFS 2009). Once in the ocean, sturgeon spend several years near coastal areas.

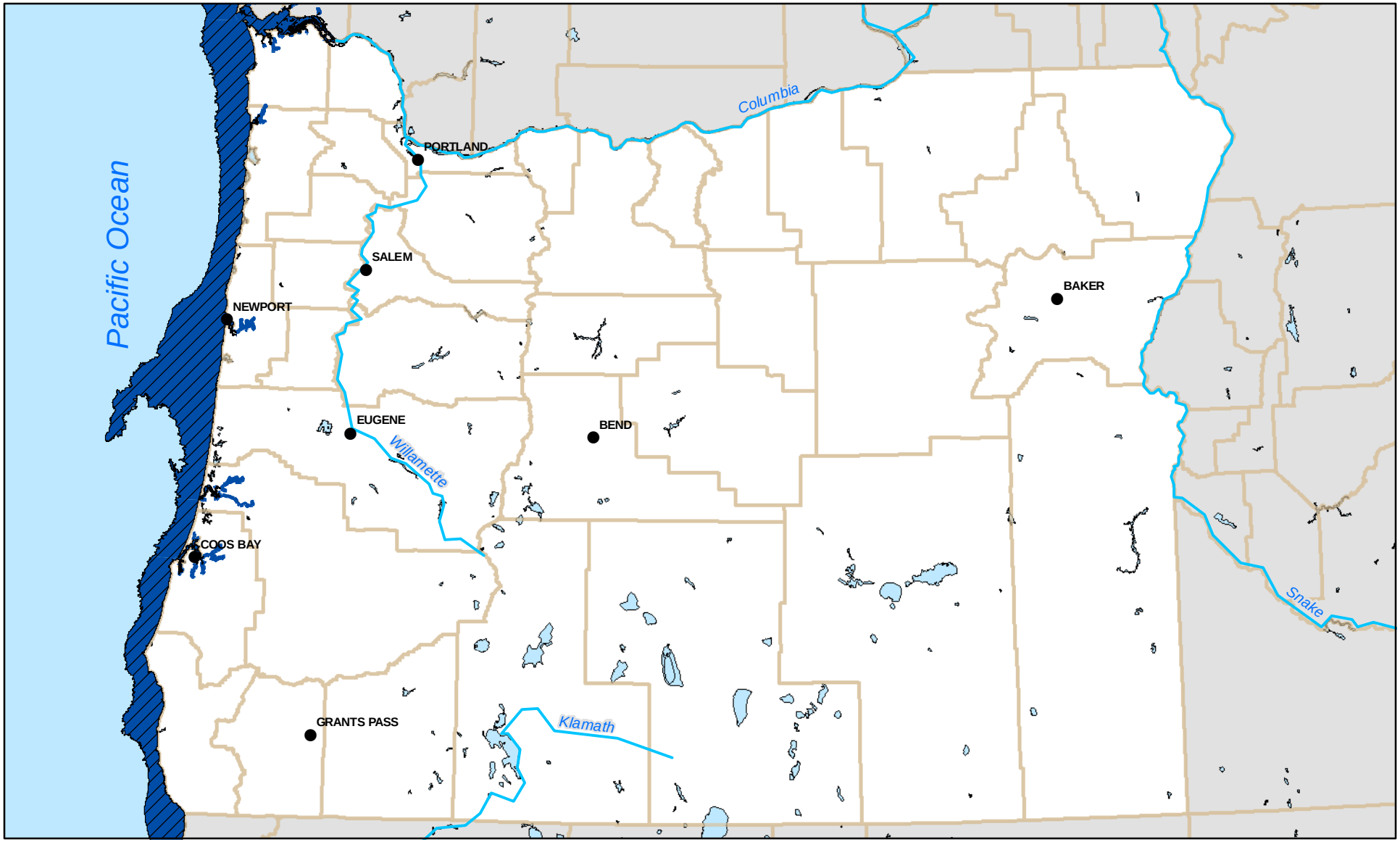


Figure 3.3-1. Green Sturgeon Southern Distinct Population Segment and Designated Critical Habitat in Oregon
Oregon NFIP Program Level Biological Assessment

Green Sturgeon Distinct Population Segment
Proposed Critical Habitat Areas
Freshwater Habitat
Marine and Estuarine Habitat
Major Rivers
Interstate
State Highway
Oregon Counties
Major Open Water/Ocean

Sources: NOAA Fisheries, ODFW

N

0 25 50 100 Miles

File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-3-1_Green_Sturgeon_DPS.mxd

Print Date: July 12, 2011

Outside of their freshwater range, adults from both the southern and northern DPSs mix (NMFS 2009). Adults from throughout the sturgeon's range have been documented using estuaries in Oregon in the summer (NMFS 2009).

In the 2005 stock assessment, the northern DPS was considered to not be at risk of becoming extinct in the near future (NMFS 2005). Part of the reasoning for this is the relatively good spawning conditions in the Rogue River, a substantial population in the Klamath River, and the possibility of infrequent spawning in other Washington and British Columbia streams, all of which spreads the risk to the population. However, there was a great degree of uncertainty associated with the species because so little is understood about adult distribution or requirements of the juvenile fish.

3.4 EULACHON

The southern DPS of eulachon was listed as a threatened species under the ESA in March 2010 (75 FR 13012). The southern DPS includes all eulachon found in streams from the Skeena River, British Columbia south to and including the Mad River in Northern California. In Oregon, populations exist in the Columbia, Sandy, and Umpqua rivers and Tenmile Creek (Figure 3.4-1). Critical habitat was proposed for this DPS on January 5, 2011 (76 FR 515). Proposed critical habitat includes areas used by eulachon in these streams for the width of the stream channel as defined by the OHWL. In the Umpqua River, critical habitat was designated from the mouth to the confluence with Mill Creek; in Tenmile Creek, from the mouth to the Highway 101 crossing; in the Sandy River from the confluence with the Columbia River upstream to the confluence with Gordon Creek; and in the Columbia River from the mouth to Bonneville Dam (76 FR 515).

Eulachon are an anadromous species of smelt that spend several years in the ocean before returning to freshwater to spawn. Entry into freshwater appears to be temperature dependant, with migration halting at temperatures below 4°C or above 8°C (Moyle 2002). The adults spawn in freshwater from January through March in the Columbia River and coastal Oregon Rivers (NMFS 2010a). Spawning occurs en masse, and eggs are released into the water column where they sink and adhere to the bottom (NMFS 2010a). Hatching time is temperature dependant and reported as 14–40 days (NMFS 2010a; Molyle 2002). Larval eulachon drift downstream into the estuary and ocean after hatching.

When they were originally proposed for listing in 2007, there was difficulty determining the true DPS boundary, especially the northern boundary. The highest risks to the population identified at that time included climate change impacts on ocean conditions, climate change impacts on freshwater habitat, bycatch, dams and diversions, and predation (NMFS 2010b). The review for the original proposal concluded that eulachon had experienced an abrupt decline throughout the southern portion of its range and was at a moderate risk of extinction (NMFS 2010b).

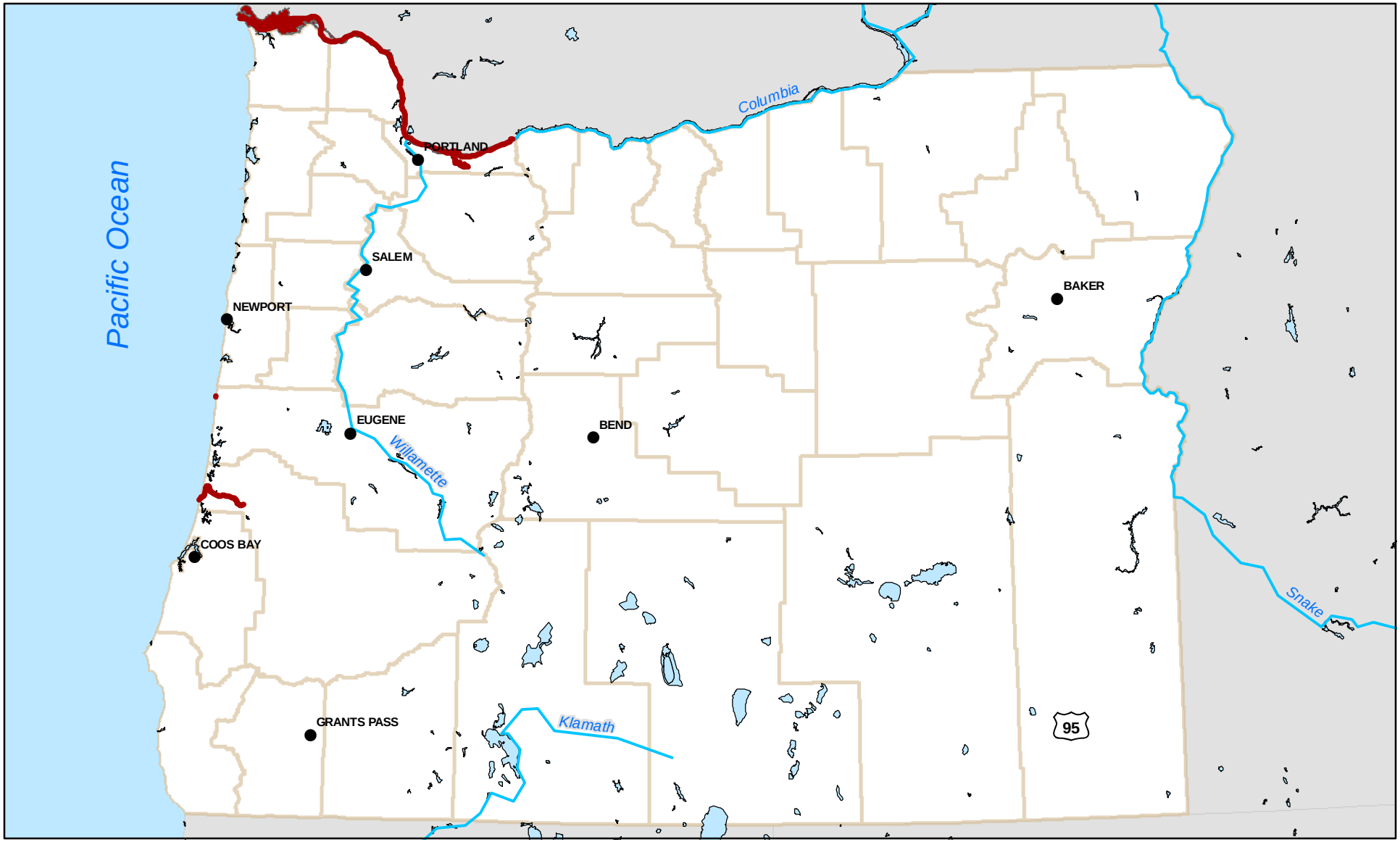


Figure 3.4-1. Pacific Eulachon Proposed Critical Habitat for the Southern Distinct Population Segment in Oregon
Oregon NFIP Program Level Biological Assessment

Proposed Eulachon Critical Habitat
Major Rivers
Major Open Water/Ocean

Note: Spatial data for proposed eulachon critical habitat is not avaliable at this time. Information displayed on this map was derived from the information published in Federal Register notice (76 FR 515).

N

0 50 100 Miles

Sources: NOAA Fisheries, ODFW

Additional information collected or discovered since the original listing provided clarification on the DPS boundary and population status in the southern portion of the range. The 2010 status review confirmed the risks to the populations described by the previous review team. In addition, concern was expressed that the remaining populations were at extremely low levels, approaching historic lows in the case of the Columbia River population, and therefore at a higher level of relative risk (NMFS 2010b). The 2010 status review concluded that eulachon were at risk of extinction throughout a significant portion of the southern DPSs range (NMFS 2010b).

3.5 EXAMPLE COMMUNITIES

Seven local government jurisdictions in Oregon were selected as example communities for the effects analysis presented in this PLBA (Table 3.5-1). These communities were chosen because they participate in the NFIP program, have recorded NFIP land use actions in the SFHA, issued LOMR-Fs, are located within the geographic range occupied by the ESUs/DPSs of listed fish species that are the focus of this document, and offer a diverse sample of community size and location. For each community, this section presents an overview of watershed conditions, species and habitat conditions, a summary of how the communities implement the NFIP, and a summary of other local regulatory programs that affect floodplain development. Figure 3.5-1 shows the location of the seven example communities. Table 3.5-2 provides summary statistics on NFIP actions in these example communities.

Data on the percent of developed land for the example communities were analyzed two ways, one for the cities and one for the counties. For the cities, an environmental planner digitally overlaid the SFHA and the city boundary and then drew polygons around all land considered developed including parking lots, buildings, construction sites, and other man-made structures. Open spaces such as green-space parks and woodlands were considered undeveloped.

Because this would not be an efficient process for the much larger land areas of the counties, Landsat cover data were used to analyze the percent of developed land for the counties (Umatilla and Lane counties). Because of the relatively small size of the cities compared to the counties, Landsat data, with a precision of 30 meter square pixels, were not an appropriate tool to apply to the cities. For the counties, a GIS specialist excluded all incorporated areas in the counties, overlaid the SFHA, and then calculated all land covers classified as developed within the SFHA.

Table 3.5-1. Example Communities and ESUs/DPSs Found in those Communities.

Example Community	Chinook-Lower Columbia Fall, Late-fall, and Spring-run	Chinook-Upper Willamette Spring-run	Chinook- Snake River-Fall	Chinook-Snake River-Spring-Summer	Chum-Columbia River	Coho-Lower Columbia	Coho-Oregon Coast	Coho-Southern OR-Northern CA	Steelhead- Lower Columbia	Steelhead-Middle Columbia	Steelhead-Upper Willamette	Steelhead-Snake River Basin	Southern DPS Green Sturgeon	Eulachon
Fairview	X				X	X			X				X	X
Eugene		X									X			
Lane County		X					X							
La Grande				X								X		
Coos Bay							X						X*	X*
Medford								X						
Umatilla County										X				

* Green sturgeon and eulachon reported from Coos Bay, but populations not established there.

Table 3.5-2. Summary of NFIP Implementation in Example Communities.

Community	Initial FIRM Date	Current FIRM Date	Contracts-in-Force (Total)	Contracts-in-Force (in SFHA)	Post-FIRM Contracts in SFHA	LOMR-Fs	Repetitive Loss Claims	CRS Rating
Coos Bay	1984	2009	145	115	21	9	13	-
Eugene	1986	1999	929	527	282	48	0	7
Fairview	1986	2009	39	10	2	15	1	-
La Grande	1980	1996	57	49	12	2	0	-
Lane County	1985	1999	2,587	1,643	480	18	13	7
Medford	1981	2011	230	163	102	9	0	8
Umatilla County	1978	2010	186	80	23	2	0	-

Sources: FEMA 2010e,f; BureauNet 2011.

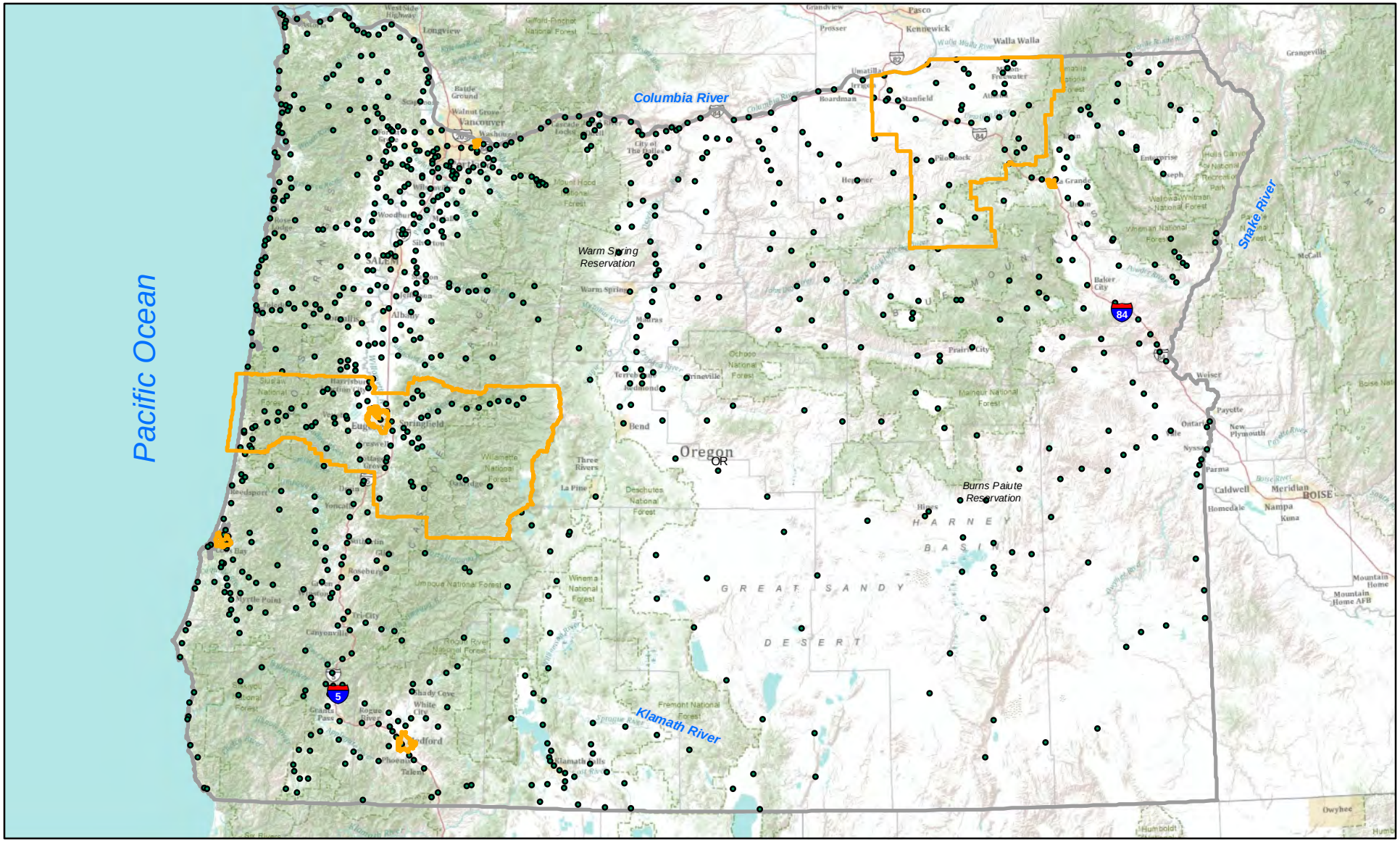


Figure 3.5-1. Representative Communities
Oregon NFIP Program Level Biological Assessment

- City
- Representative Community

3.5.1 CITY OF FAIRVIEW

General Watershed Conditions

Fairview is a largely residential community. The residential center straddles Interstate-84 (I-84) with some industrial development in the northeast part of the town. Blue Lake Regional Park occupies a majority of the Columbia River frontage; although Fairview Lake and Blue Lake are not within the city boundaries, the surrounding land is within the city (Figure 3.5-2). Recreational marinas, an aggregate and wood chip port terminal, and other commercial port terminals occur on the Columbia River shoreline.

Fairview Creek, the primary surface water feature of the town, flows through the middle of town and drains into Fairview Lake. The portion of Fairview south of, and including Fairview Creek and Fairview Lake, is within the Columbia Slough Watershed (BES 2005). The Columbia Slough was once part of the Columbia River floodplain, until 1919 when numerous actions were taken to control flooding and allow full agricultural and industrial use of protected areas (BES 2005). These modifications, and those to come following the Vanport Flood of 1948, created the existing system. Water from Fairview Lake drains to the west through the slough before eventually entering the Willamette River just upstream from the confluence with the Columbia. The vast majority of this larger watershed has been urbanized and supports a mix of residential, industrial, commercial, and public infrastructure. Open spaces are relatively abundant and include the Smith and Bybee lakes complex, and golf courses.

Columbia Slough, including Fairview Creek, is on the DEQ 303(d) list of impaired waterbodies. As might be expected from its urbanized surroundings the impairments are from a suite of chemicals, heavy metals, and organic products; temperature; dissolved oxygen; pH; and sediment. The TMDL for Columbia Slough (DEQ 1998) indicates that the cool water aquatic life threshold of 6.5 milligram per liter (mg/L) for dissolved oxygen is violated throughout the lower slough, which is completely anoxic at times. Dissolved oxygen problems in the lower slough result from runoff of de-icing chemicals from Portland International Airport, which generate a high biological oxygen demand. The TMDL does not present any information for dissolved oxygen in the upper reach that includes Fairview; however, the next reach downstream has no reported dissolved oxygen violations (DEQ 1998). The Willamette River TMDL includes a temperature element (DEQ 2006). The Columbia Slough routinely exceeds the beneficial use criterion of a 7-day average temperature of 20°C for migrating salmonids (DEQ 2006). Many of the other pollutants in Columbia Slough are legacy contaminants from urbanization and industrial land uses. In general, DEQ considered the level of information available on these materials inadequate to make a decision regarding the impairment of water quality (DEQ 2010f).

Arata Creek, in the northeastern portion of the city, is a tributary to an unnamed stream that flows into the Columbia Slough upstream of a barrier near Northeast 18th Avenue.

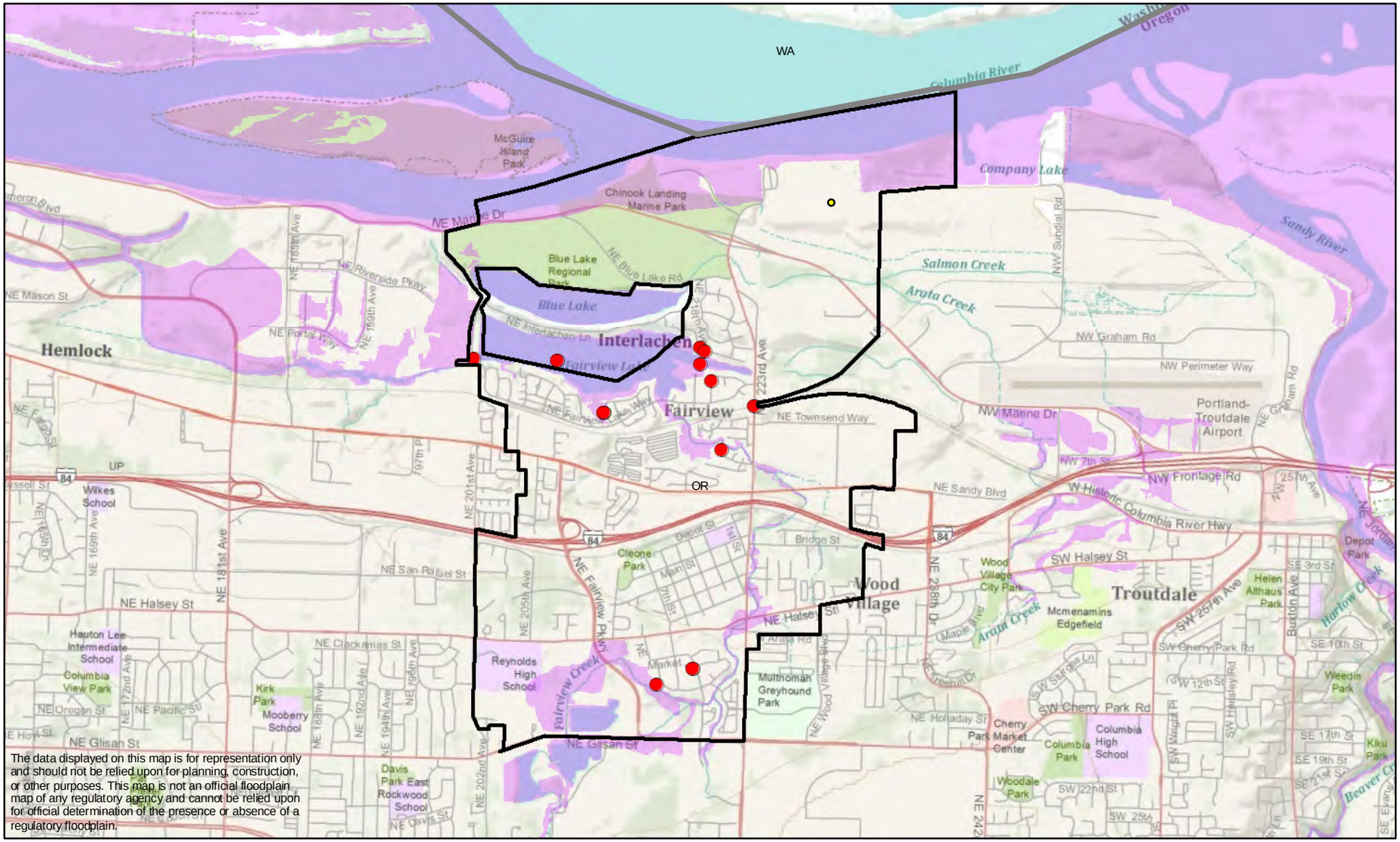


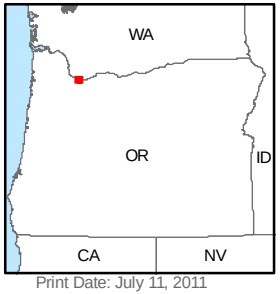
Figure 3.5-2. City of Fairview Depicting SFHA, Local LOMR-F Actions, and Repetitive Loss
Oregon NFIP Program Level Biological Assessment

- LOMR-F
- 100-year Flood Zone

Repititve Loss
- 1 or less
- 2
- 3-4
- More than 4

N

0 0.5 1 Miles



File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-5-2_City of Fairview.mxd

Print Date: July 11, 2011

The mapped SFHA for the city includes Fairview Creek, land around Fairview Lake, and the Columbia River shoreline.

Species and Habitat Conditions

Fairview is adjacent to the Columbia River, and fish species in the river pass by the city during up and downstream migrations. This includes Lower Columbia Fall, Late-fall, and Spring-run Chinook, Snake River Fall and Spring-run Chinook, Lower Columbia River coho ESU, the Columbia and Snake River ESUs of steelhead, Columbia River chum, green sturgeon, and eulachon

Salmonids

There is no spawning habitat for salmonids within Fairview, including the Columbia River. A review of aerial photographs indicates that the Columbia River shoreline within the city is mostly unvegetated. This represents low quality rearing habitat for most salmonids, which prefer some form of cover such as large wood, aquatic vegetation, or structural complexity for long-term residence (e.g., Moyle 2002; McMahon and Holtby 1992). Smaller juvenile salmonids tend to be found closer to the stream margins compared to larger fish of the same species (Carter et al. 2009). While juvenile salmonids are likely found within this area during downstream migration, long-term residency is unlikely for two reasons: there is a lack of suitable rearing habitat, and many of these fish are actively migrating to the ocean. Juvenile Chinook move through the system on average at rates of about 80 km a day (Carter et al. 2009).

Salmonid use of the Columbia Slough watershed is limited to the lower slough downstream of about Northeast 18th Avenue (BES 2005). Thus, listed salmonids do not occur within Fairview or Arata creeks (pers. comm., Alsbury 2011).

Population trending of salmon in the Columbia River is an extremely complicated topic and beyond the level of detail required in this PLBA. However, in their stock assessment of Oregon Chinook populations, McElhany et al. (2007) concluded that all of the Lower Columbia River stocks within the Lower Columbia River ESU were at a high risk of extinction, except those in the Sandy River where the late-fall run was considered at low risk and the spring-run was a moderate risk. These at-risk conclusions are similar to other populations that pass through Fairview on their way to spawning grounds upstream. This includes the Snake River Chinook, of which a large percentage of returning fish are of hatchery origin (Good et al. 2005).

Sturgeon

Green sturgeon belonging to the southern DPS enter the Columbia River estuary in spring through late summer (NMFS 2009); the upstream distribution of these individuals is unclear. Spawning from this DPS does not occur in the Columbia River (NMFS 2005). Population trend information for the southern DPS sturgeon that could be using the Columbia River is not readily

available. These fish are transitory residents in the river, and separating them out from the northern DPS is not practical. ODFW (2005) indicated that there was no discernable population trend, either positive or negative, in Oregon populations of green sturgeon.

Eulachon

Eulachon make spawning migrations up into the Sandy River just east of Fairview. Mainstem Columbia River eulachon spawning areas have not been specifically documented, but spawning itself has been documented in the Columbia River through capture of spawned and partially spawned eulachon (NMFS 2010b). Because eulachon spawn in the mainstem and are known to migrate through Fairview, spawning could occur adjacent to the city in the Columbia River. According to the NMFS (2010b), eulachon returns to the Columbia River increased between 2001 and 2003 then dropped substantially in 2005, a similar pattern to that of the commercial landings of eulachon the marine fishery.

Interaction with Floodplain

The mapped SFHA for all of Fairview is approximately 35 percent developed. The mapped SFHA of Fairview Creek does not provide habitat for, nor directly interact with, listed species of fish because they do not have access to this area. Land use action in the SFHA could potentially affect downstream resources, including the Columbia River and associated fish stocks. The mapped SFHA of the Columbia River may provide refuge habitat from high flows for listed salmonids because only about a third of the SFHA is developed with industrial and residential land uses. The remainder is either recreational open space (e.g., Blue Lake Regional Park) or what appears to be riparian forest, which provides some floodplain function and benefit to fish habitat.

The current habitat along the Columbia River is marginal quality for fish use. Fish access from the river to Fairview surface waters is blocked, but land use actions in the city's SFHA contribute to downstream water quality effects in the Columbia River (see Chapter 4). In general terms, the floodplain function in Fairview is quite poor. Because of past development and land clearing, limited vegetation is available in the SFHA. Flood water storage and some limited filtration capacity are the main functions afforded by the existing conditions, and these functions are provided by open space parks near the Columbia River. Fish refuge, recruitment of woody debris, off-channel resting/rearing areas, and shading, for instance, are functions generally not provided by the floodplain in Fairview.

NFIP Implementation

The City of Fairview entered the NFIP regular program in 1987. The initial FIRM became effective in 1986, and their current FIRM map became effective as of 2009. FEMA completed an FIS for Fairview in 1995, which identified flooding of Fairview Creek in the Old Town area (downtown Fairview) as the main flooding concern. A summary of the number of contracts-in-

force in the community, contracts-in-force in the SFHA, post-FIRM contracts in the SFHA, number of LOMR-Fs that have occurred since 1990, and number of repetitive loss claims that have occurred since 1990 is found in Table 3.5-2. Fairview does not participate in the CRS.

Fairview has a high number of recorded LOMR-Fs relative to its small size, as shown on Figure 3.5-2. The majority of these are associated with residential development adjacent to Fairview Lake, with several farther upstream, adjacent to Fairview Creek. There are no recorded LOMR-Fs in the SFHA along the Columbia River.

Development within floodplains is regulated by a Flood Damage Prevention Ordinance that complies with NFIP minimum standards (described in Section 2.2), as well as the higher standards required by Oregon State Law (i.e., elevation of the lowest floor to 1 foot above the BFE). Floodplain development is also addressed in the city's Comprehensive Plan, a floodplain zoning overlay, a Significant Environmental Concern (SEC) overlay, a Wetlands and Riparian Buffer Overlay, and within the subdivision ordinance. Fairview has adopted Oregon State Building Codes, which contain provisions for flood-proof construction.

Comprehensive Plan

Flooding, along with other natural hazards, is addressed in the city's 2004 Comprehensive Plan (Fairview 2004). The Comprehensive Plan makes reference to Metro's (the Portland metropolitan area regional planning agency) Urban Growth Management Functional Plan Title 3, which requires balanced cut and fill within floodplains and the elevation of the lowest floor of structures to be 1 foot above the BFE. The Comprehensive Plan establishes policy that directs the city to incorporate these standards within the Flood Damage Prevention Ordinance.

Flood Damage Prevention Ordinance

The Flood Damage Prevention Ordinance is codified in Chapter 16.05 of the Fairview Municipal Code (FMC). The ordinance contains typical NFIP minimum standards including requiring permits for development in an SFHA and elevation and flood-proofing of structures. As noted above, residential and non-residential structures are required to be elevated 1 foot above the BFE. Manufactured homes are required to be elevated 18 inches above the BFE. The ordinance allows for variances, in accordance with FEMA guidance. Variances are not allowed where flood heights are raised, or where an increased threat to public safety is created. The ordinance requires that Critical Facilities be located outside of the SFHA where possible or be elevated to 3 feet above the BFE or to the height of the 500-year flood, whichever is higher. Critical Facilities are defined as schools, hospitals, nursing homes, police, fire, and other emergency services, and installations producing, using, or storing hazardous materials or waste.

Floodplain Overlay

The city's development code establishes a Floodplain Overlay (FMC 19.105), which is identified on the city's zoning map. The Floodplain Overlay corresponds to the SFHA and requires compliance with the Flood Damage Prevention Ordinance. The overlay designation allows outright excavations and fills required for the planting of vegetation or trees, and habitat restoration or enhancement. Compensatory storage is required for fills within the overlay. Storage of hazardous materials is prohibited.

Significant Environmental Concern Overlay

The city has established a Significant Environmental Concern (SEC) Overlay on its official zoning map, and regulates development within the overlay pursuant to the standards of FMC 19.100. SECs include wetlands or riparian habitat or other areas with significant environmental value. SECs are mapped within portions of the SFHAs of Fairview Creek, Fairview Lake, and the Columbia River. Permits are required for uses proposed within an SEC, with an exception for the maintenance or repair of flood control structures. Buildings are prohibited within the SEC unless there is no practicable alternative. In all cases where development is allowed in the SEC, the development must be the minimum necessary to allow lawful use of the site. Recreation areas and pedestrian trails are allowed in SECs, provided that construction takes place between May 1 and October 30, and provided that no excavation, fill, or alteration of existing topography occurs.

Wetlands and Riparian Buffer Overlay

Fairview regulates development in or adjacent to wetlands and riparian areas through a Wetlands and Riparian Buffer Overlay (FMC 19.106). The stated purpose of the overlay includes protection of fisheries and wildlife habitat, prevention of property damage from storms and floods, to allow storage and conveyance of streamflows, and to maintain water quality. Undeveloped buffers of 50 feet are required for both wetlands and streams, with limited exceptions. Permits are required for any alteration proposed within a buffer. Any buffer area that is also within an SFHA must also comply with the Flood Damage Prevention Ordinance.

Subdivision Ordinance

The city's subdivision ordinance (FMC 19.430) requires that the design of land divisions minimize the risk of flood damage. Creation of lots entirely within the floodway is prohibited, and any land division within the SFHA is required to meet FEMA requirements. When any land division of two or more lots is proposed in a flood-prone area where a BFE has not been identified, the ordinance requires that the project proponent hire a qualified professional to establish the BFE.

3.5.2 CITY OF EUGENE

General Watershed Conditions

Eugene is located in the central portion of the Willamette River valley just upstream of the confluence with the McKenzie River (Figure 3.5-3). The Willamette River and Amazon Creek watersheds are the primary watersheds within the city boundaries. Amazon Creek is a subwatershed of the Long Tom River watershed. Amazon Creek flows from its headwaters on the north side of Spencer Butte through the southern portion of the city, eventually entering the Long Tom River downstream of Junction City, Oregon about 12 miles downstream of Eugene. According to DEQ (2006), most of the flow in Amazon Creek is diverted to Fern Ridge Lake via the Amazon Diversion Channel.

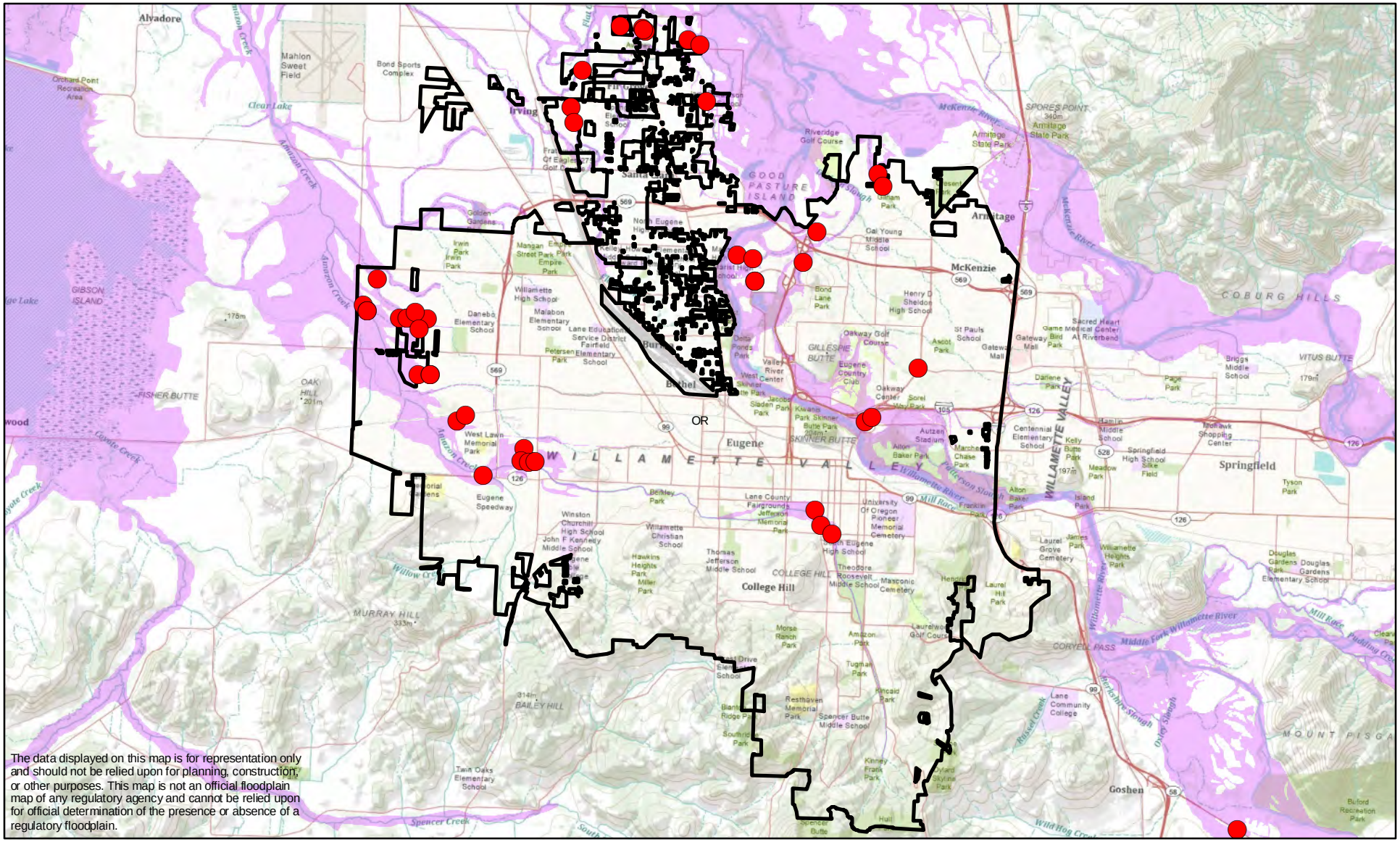
The outflow from the lake is Long Tom River, which eventually enters the Willamette River downstream of Monroe, Oregon. A small portion of the McKenzie River watershed is within the northeastern portion city.

Willamette Watershed

Land use within Eugene is a mix from residential to industrial. The SFHA along the Willamette River supports residential developments, commercial and educational facilities, and open space. The south bank of the river floodplain is relatively undeveloped and supports mostly parks and open space.

Dedrick Slough is a remnant meander that connects to the Willamette River in two places within the city. The upstream end is just downstream of the Valley River Center, and the downstream end is just north of Goodpasture Island. Dedrick Creek originates on the southeast side of Gillespie Butte and enters Dedrick Slough near where the Delta Highway crosses the south slough boundary. The creek and slough complex collects much of the surface water and local small creeks from the northern portion of the watershed before entering the Willamette River. Much of the floodplain within the city is associated with this slough and the area between the slough and the Willamette River. The SFHA here includes the Delta Ponds Habitat Restoration Project, where the City of Eugene, in cooperation with numerous state, federal, and local stakeholders, has restored more than 150 acres of abandoned gravel pits into functional wetlands that provide habitat for numerous species, including listed salmon (LCOG 2005).

Patterson Slough diverges from the north bank of the Willamette River at the upstream end of Alton Baker Park in central Eugene. This waterway is a complicated system of slough, creek, and artificial channels and ponds. Water from this complex flows back into the Willamette River at the downstream end of Alton Baker Park. The shortest route from intake to outlet is about 2.5 miles, while the longest is almost 3 miles. The shorter route borders the north side of the park while the longest flows around the north side of Autzen Stadium parallel to I-105 before rejoining the original channel.



The data displayed on this map is for representation only and should not be relied upon for planning, construction, or other purposes. This map is not an official floodplain map of any regulatory agency and cannot be relied upon for official determination of the presence or absence of a regulatory floodplain.

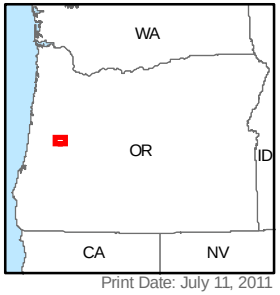
Figure 3.5-3. City of Eugene Depicting SFHA, Local LOMR-F Actions, and Repetitive Loss
Oregon NFIP Program Level Biological Assessment

- LOMR-F
- 100-year Flood Zone

Repetitve Loss
- 1 or less
- 2
- 3-4
- More than 4

N

0 0.5 1 Miles



Minor tributaries feed this longer route from urban areas of the city east of I-5. This combination of channels has created an area between I-105 on the north and I-5 on the east where the majority of the land is within the SFHA.

DEQ (2006) has prepared a basin-wide TMDL for the Willamette River; Eugene is within the Upper Willamette Basin. The Upper Willamette is listed as not complying with standards for bacteria, temperature, and mercury. Of these three, temperature is the key issue for fish and exceeds the criteria considered beneficial for rearing, migration, and spawning. The Willamette River within Eugene and in Amazon Creek is designated as salmon and trout rearing and migration habitat in the Willamette River TMDL (DEQ 2006). Within the Upper Willamette, the temperature criteria are 13.0°C for periods of salmon and steelhead spawning and 18.0°C for periods of salmon and steelhead rearing and migration (DEQ 2006). Temperature in these surface waters has been altered by changes to riparian vegetation, channelization, and flow alteration, among other factors.

Amazon Creek Watershed

The Amazon Creek watershed within the city is highly urbanized; a 2000 watershed assessment mapped all but the fringes of the Amazon Creek watershed as urban (LTWC 2000). Review of recent aerial photos confirms this description. The dissolved oxygen TMDL for Amazon Creek describes the creek channel in this area as "significantly altered from its natural condition" (DEQ 2006). Most of the watershed is residential with some commercial/industrial land uses found primarily north of West 11th Avenue.

The Amazon Diversion Channel that connects Amazon Creek to Fern Ridge Reservoir is 303(d) listed as impaired for dissolved oxygen (DEQ 2006). The threshold for this impairment is 8.0 mg/L. The pollutants of concern are those that create a direct or indirect oxygen demand (e.g., plant respiration, decaying biological matter, nutrient loading, etc.). Actions within the floodplain that influence this condition are similar to those that influence temperature (e.g., shading, flow, channelization).

McKenzie Watershed

Only a small fragment of the McKenzie River watershed is within Eugene's city boundaries. Most of this area is residentially developed with remnant agricultural lands and open space (e.g., golf course). Just outside the Eugene city boundaries are what appear to be relatively large gravel mining facilities. The small areas of SFHA within the city (near Gilham Park) are likely associated with a small tributary to the McKenzie River. This area was modeled as having relatively lower quality habitat for fish (Alsea Geospatial, Inc. et al. 2000), probably because of the channel modifications from instream aggregate extraction and from urbanization. Please see the detailed discussion of water quality issues for the McKenzie River as presented in Section 3.5.3.

Species and Habitat Conditions

Eugene straddles the Willamette River, and the species of concern in this area are those that make long-distance migrations to and from spawning areas. Green sturgeon and eulachon are not found within the Willamette River above Willamette Falls and are therefore not described in this section.

Salmonids

The listed species that occur within this urban area include Upper Willamette River spring-run Chinook and Upper Willamette River steelhead. Both of these species are listed as threatened. Critical habitat has been designated for Chinook (Figure 3.2-1). This includes the Willamette River and select tributaries up to the ordinary high water elevation or to bankfull width in areas where ordinary high water has not been defined (70 FR 52630). Spring-run Chinook and steelhead use within Eugene is probably limited to upstream adult migration, juvenile rearing, and downstream migration. While fall-run Chinook spawn and rear in the mainstem Willamette River, spring-run Chinook do not. Spring-run Chinook use this area as a migration corridor for both adults and juveniles, and this segment of the river also provides juvenile rearing habitat. The status of the wild population of spring-run Chinook in the Upper Willamette River is unclear and difficult to determine because of the magnitude of hatchery supplementation (ODFW 2005). The productivity of this area is presumed to be low because relatively few adults return despite the large numbers of naturally spawning hatchery fish (ODFW 2005).

Steelhead typically spawn in smaller tributaries to larger rivers such as the mainstem Willamette River. Fish distribution mapping indicates that steelhead use the mainstem Willamette River within Eugene as a rearing and migration corridor only (StreamNet 2011). The Long Tom River Watershed Assessment does not report the presence of any listed salmon or steelhead species within the Amazon Creek watershed (LTWC 2000). Although the assessment is circumspect on the reasons why there are no listed fish, substantial watershed changes are likely the reason. These include dams that block access, channelization and levee construction, dredging, agriculture and associated removal of riparian habitat, logging, and urbanization.

The watershed conservation strategy indicates that juvenile spring-run Chinook access the lower portions of the Long Tom River from the Willamette River (Dedrick and Thieman 2005), but this is well outside Eugene. Steelhead populations in the Willamette River appear to have reached low levels in the early to mid-1990s, after which population trends have generally been positive both in terms of abundance and recruits per spawner (ODFW 2005). Hatchery supplementation does not appear to be a problem for these populations, which are mostly wild fish (ODFW 2005).

Interaction with Floodplain

In its predisturbance state, the Willamette River floodplain was a wide swath of riparian forest interconnected with sloughs and creeks (LCOG 2005). As with many areas, development,

channel alteration, and water projects changed the floodplain characteristics. Approximately 40 percent of the SFHA is developed. Natural floodplains are constrained by development and provide little or no habitat for fish at high flows. Extensive wetland restoration in the Amazon Creek basin over the past 15 years has improved general floodplain functions and benefits to downstream surface waters. In addition, the Delta Ponds Restoration project along the Willamette River in Eugene has illustrated the importance of floodplain rearing habitat for salmon and steelhead. What was once a series of invasive species-laden gravel pits is now providing important habitat for both Chinook and steelhead amongst a variety of other fish species. Thus, floodplain function in Eugene is mixed. Water quality is poor, but there are some large areas of wooded riparian habitat and emergent wetland that provide water filtration, shading, and woody debris input to the floodplain. The Eugene area is flat and historically the streams and rivers in the vicinity ranged widely in the floodplain. Diking and development over the past 150 years have severely constrained the surface water features, limiting their function for off-channel habitat and fish refuge and rearing. Increased mitigation and restoration efforts around Amazon Creek and the Willamette River have restored some functions, such as floodwater storage and fish refuge, to these water bodies.

Summary of NFIP Activities

Eugene entered the NFIP regular program in 1986, adopting its initial FIRM that same year. The current FIRM is dated 1999. The City has participated in the CRS since 1991 and has achieved a rating of 7.

Of the seven example communities examined here, Eugene has the largest population, the second greatest number of NFIP-insured properties, and the greatest number of LOMR-Fs, as shown on Figure 3.5-3 and Table 3.5-2. There are extensive floodplain areas within the city's jurisdiction due to the presence of the Willamette and McKenzie rivers, Amazon Creek, and the flat valley topography. Portions of the SFHAs within the city are highly urbanized. In particular, the Amazon Creek SFHA bisects the city's primary industrial area in west Eugene. As a result, the level of NFIP activity in the community is relatively high, with a correspondingly high number of LOMR-Fs associated with residential and other urban development.

Eugene implements the standards of the NFIP through a Floodplain Development Ordinance. The city also implements other overlapping regulations that may affect development in floodplains. These include a natural resource zone, and waterside protection, wetland buffer protection, water quality, and water resources conservation overlay zones. The City implements the West Eugene Wetlands Plan through these ordinances and through the establishment of a wetland mitigation bank. Development proposed on land adjacent to the Willamette River requires a Willamette River Greenway permit. These elements are described further below.

Floodplain Development Ordinance

Eugene has a Floodplain Development Ordinance found in section 9.6705 – 9.6709 of the Eugene Code (EC) that implements the NFIP minimum standards and the State of Oregon requirement to elevate the lowest floor of a structure to 1 foot above the BFE. The city requires a no rise certification for development in floodways and prohibits development in floodways where it would result in an increase of flood heights.

Natural Resources Zone

Eugene has applied a Natural Resource zoning designation (EC 9.2500) to portions of the floodplain of Amazon Creek. Uses within the zone are generally limited to trails, interpretive centers, natural area restoration, or similar uses.

Waterside Protection Overlay Zone

Riparian and wetland protection in Eugene is provided through the use of overlay zones. The Waterside Protection Overlay Zone (EC 9.4700) requires buffers of 60 feet from the top-of-bank for streams within a floodway and 40 feet from top-of-bank for streams outside a floodway. Where the top-of-bank cannot be identified, the buffers are 75 and 50 feet, respectively, measured from the OHWL.

Water Quality Overlay Zone

The city applies a Water Quality Overlay Zone (EC 9.4770) to waterways identified pursuant to Section 303(d) of the Clean Water Act, waterways that are tributary to those waterways, and headwater streams. The Water Quality Overlay Zone requires setbacks of 25 feet from top of high bank for 303(d) waterways and 40 feet from the centerline of headwater streams.

Wetland Buffer Overlay Zone

The Wetland Buffer Overlay Zone (EC 9.4800) is applied to wetlands identified in the city's West Eugene Wetlands Plan, and requires setbacks based on wetland value categories (i.e., high, moderate, and low value). Buffers can either be Type I or Type II. Type II setbacks are smaller but require vegetation and stormwater quality enhancements. The Type I and Type II setbacks for high value wetlands are 100 feet and 50 feet, respectively. For moderate value wetlands, the setbacks are 50 feet and 25 feet, respectively. Low value wetlands do not require setbacks outside the jurisdictional boundary of the wetland.

Water Resources Conservation Overlay Zone

The Water Resources Conservation Overlay Zone (EC 9.4900) applies to resource sites identified in the city's Goal 5 Water Resources Conservation Plan (Eugene and Lane County 2004), prepared pursuant to Statewide Planning Goal 5. The overlay zone establishes required conservation setbacks based on stream classifications. For Category A, B, C, D, and E streams, the setbacks are 100, 60, 40, 20, and 0 feet, respectively, measured from the top of high bank. If

there is no identifiable high bank, the setbacks are measured from the OHWL and are increased to 125, 75, 50, 25, and 0, respectively. The overlay zone also establishes setbacks for wetlands that are not identified in the West Eugene Wetlands Plan. Setbacks for Category A, B, and C wetlands are 50, 25, and 0 feet, respectively.

West Eugene Wetlands Plan

In 1989, Eugene began a planning process that resulted in the West Eugene Wetlands Plan (Eugene and Lane County 2004). First adopted in 1992, and subsequently revised and updated with the current plan dated 2004, the plan seeks to balance development needs and environmental values in a highly developed, largely industrial area of west Eugene, which includes portions of the Amazon Creek SFHA.

The plan conducted an inventory of wetlands within the planning area and applied three designations: Protection, Restoration, and Development. Wetlands that are primarily located within a 100-year floodplain are generally designated for protection. The city intends for public acquisition of areas designated for protection and establishes stricter development regulations for these wetlands. Lower quality or isolated wetlands, or areas that were identified as being of particular importance for industrial development, are designated for development. The proponent of fill of wetlands with a development designation that requires compensatory mitigation pursuant to a state or federal permit can purchase credits through a city-established mitigation bank. The mitigation bank enhances disturbed or lower quality wetlands that have been designated for restoration as part of the plan.

In addition to the acquisition and mitigation components of the plan, development regulations, as described above, implement goals and policies of the plan.

Willamette River Greenway Permits

Permits are required for proposed uses in the Willamette River Greenway, which includes portions of the Willamette River SFHA (EC 9.8800). The permits require that the maximum amount of landscaped area or open space be provided between the activity and the river, provide for public access, and protection or enhancement of the natural vegetative fringe.

3.5.3 LANE COUNTY

General Watershed Conditions

Lane County covers more than 4,600 square-miles of Oregon. It stretches from the coast where fresh surface waters (the largest of which is the Siuslaw River) have their headwaters in the Coast Range, to the Willamette Valley, where streams have origins in both the Cascade Mountains and Coast Range (Figures 3.5-4 to 3.5-6). The Long Tom River, for example, originates in the Coast Range as does the Coast Fork Willamette River. The McKenzie, Middle Fork Willamette, and Mohawk rivers all have headwaters in the Cascade Mountains. The

mainstem Willamette River is formed by the joining of the Coast Fork and Middle Fork Willamette rivers just upstream of Eugene.

Because this is an extremely large area, this discussion focuses on major fish-bearing surface waters, where the majority of development concentrations exist. The resources of the Willamette River are described to a degree in Section 3.5.2 and are only elaborated upon here to reflect the larger geographical area. Overall, the same forces described previously for other rivers are acting on watershed condition, channel structure, water quantity and quality, and riparian habitat within Lane County.

Siuslaw River

Much of the following information is summarized from the Siuslaw Watershed Assessment (Ecotrust 2002). The Siuslaw River watershed covers more than 770 square-miles of the Coast Range. The headwaters are found just southwest of Eugene in the Siuslaw National Forest and near the town of Lorane. The hydrology of the Siuslaw River is driven primarily by rainfall because the Coast Range does not typically accumulate a long-term snowpack such as the Cascade Mountains. The watershed is largely undeveloped, but extensive logging and associated road building have resulted in relatively young forests covering much of the watershed. Extensive logging has substantially increased the sediment washed from the hills into the river.

The Siuslaw Watershed Assessment concluded that the condition of the watershed was poor for a number of reasons, including:

- Historic logging has reduced the supply of large wood, increased sediment loads, and increased unstable slopes. Large wood is an important element that creates both channel stability and fish habitat.
- Floodplains have been disconnected from the main river channels, and the once complex wetland and forest systems have been replaced by agricultural fields, which have eliminated important nutrient and sediment storage areas as well as productive seasonally available fish habitat.
- Riparian habitats are reduced and fragmented from their original extent. These habitats helped moderate water temperatures and sediment delivery, and provided an important source of large woody material.

Water quality is subsequently considered impaired by DEQ, largely a result of these historic land uses. Currently, DEQ lists the Siuslaw an impaired waterbody under Section 303(d) of the Clean Water Act. The impairments are mostly for temperature (high temperatures reduce the ability of water to hold dissolved oxygen and are directly harmful to fish), sedimentation (reduces spawning and rearing habitat and decreases food production for fish), dissolved oxygen, and fecal coliform (DEQ 2010g). DEQ has not yet developed TMDLs to address these impairments.

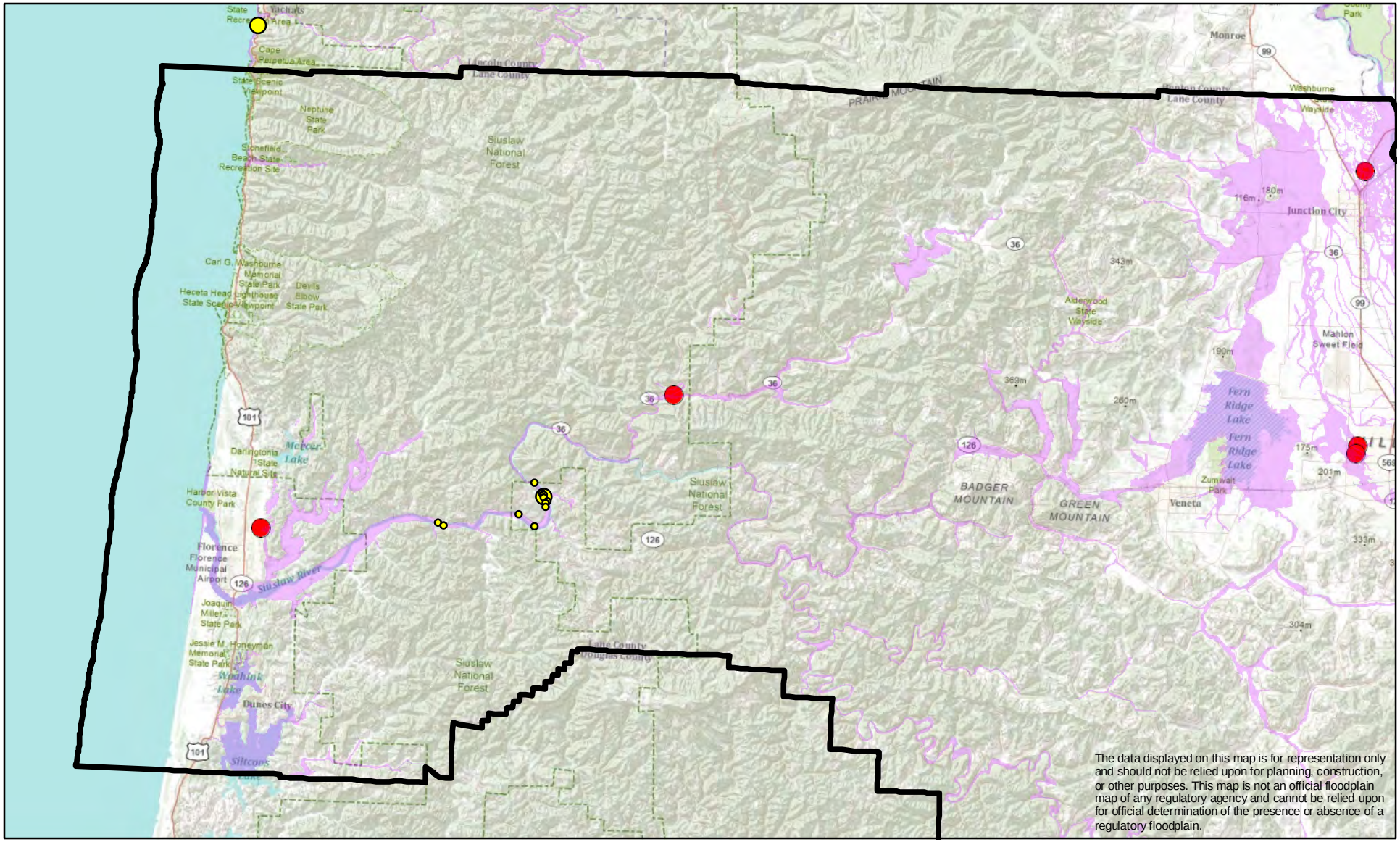


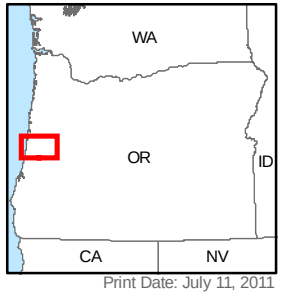
Figure 3.5-4. Western Lane County Depicting SFHA, Local LOMR-F Actions, and Repetitive Loss
Oregon NFIP Program Level Biological Assessment

LOMR-F
100-year Flood Zone

Repetitve Loss
1 or less
2
3-4
More than 4

N

0 2.5 5 10 Miles



File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-5-4_ West Lane County.mxd

Print Date: July 11, 2011

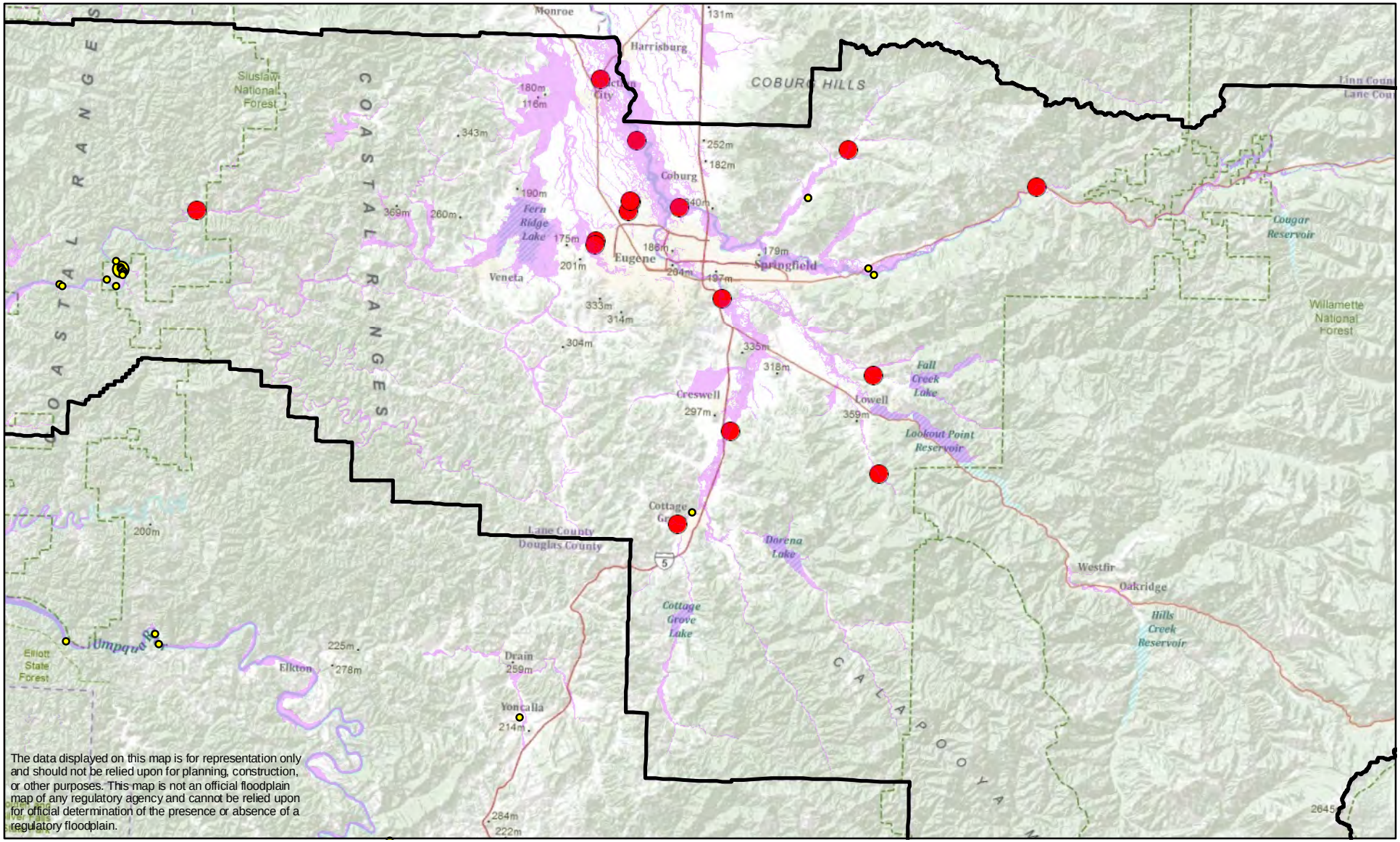


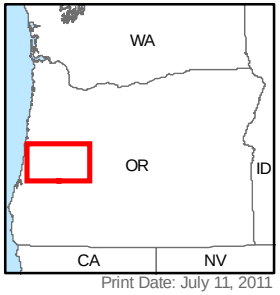
Figure 3.5-5. Central Lane County Depicting SFHA, Local LOMR-F Actions, and Repetitive Loss
Oregon NFIP Program Level Biological Assessment

LOMR-F
100-year Flood Zone

Repetitve Loss
1 or less
2
3-4
More than 4

N

0 2.5 5 10 Miles



File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-5-5_ Central Lane County.mxd

Print Date: July 11, 2011

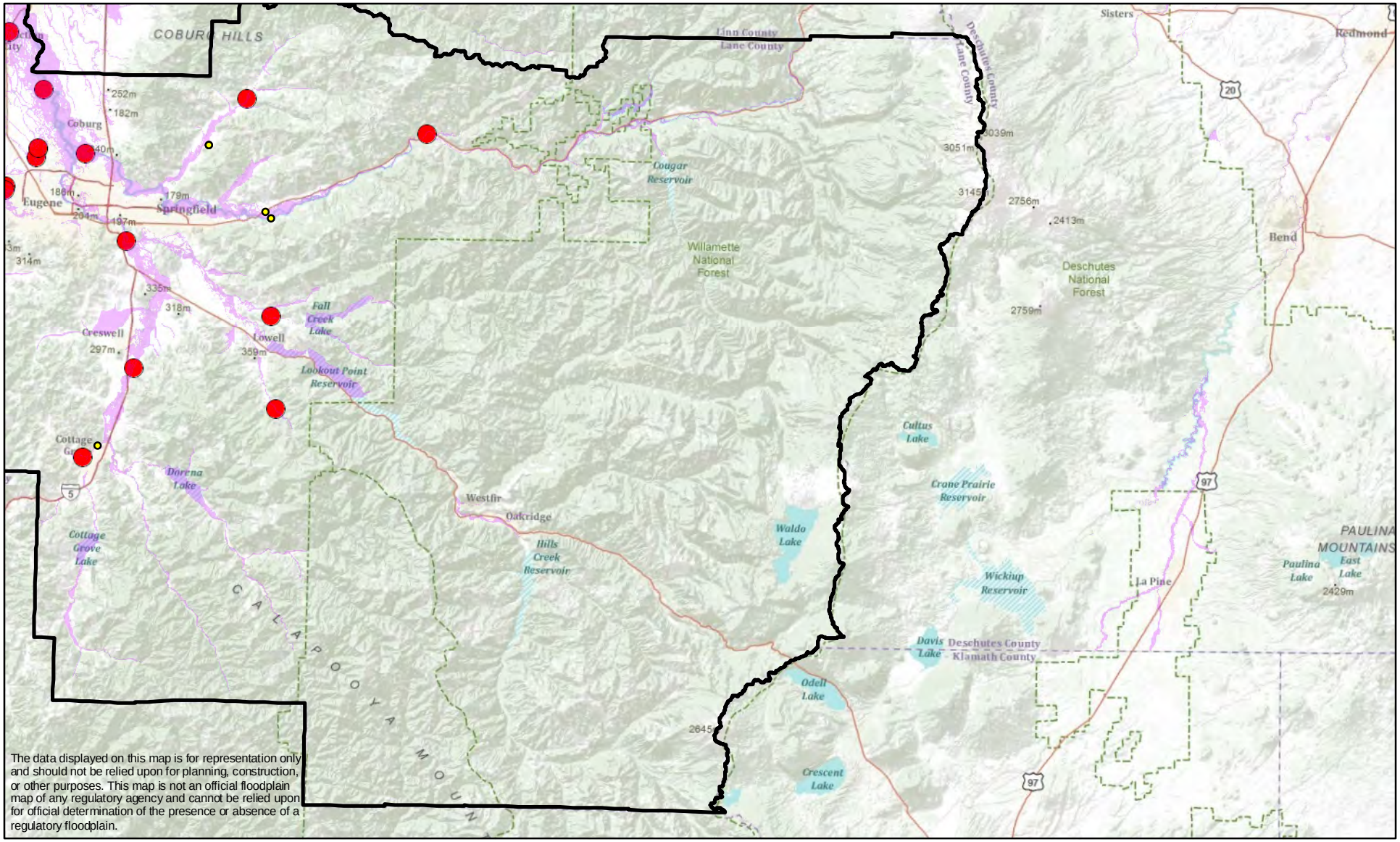


Figure 3.5-6. Eastern Lane County Depicting SFHA, Local LOMR-F Actions, and Repetitive Loss
Oregon NFIP Program Level Biological Assessment

LOMR-F
100-year Flood Zone

Repetitve Loss
1 or less
2
3-4
More than 4

N
0 2.5 5 10 Miles

WA
OR
ID
CA
NV

File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-5-6_ Eastern Lane County.mxd

Print Date: July 11, 2011

Long Tom River

The Long Tom River watershed occupies more than 400 square-miles in the southern end of the Willamette Valley. The river originates on the eastern slopes of the Coast Range and includes ten subbasins. Several tributaries in the upper watershed flow into Fern Ridge Lake, which is the largest waterbody in the watershed. Land uses are a mix of national forest, agriculture, and urbanized areas. The most heavily urbanized area is the upper Amazon Creek subunit, described in Section 3.5.2. Most of the agricultural areas are on the valley floors where slopes and soils are conducive to farming. The foothills and mountains on the south and west sides of the watershed support forest habitats. Collectively, over 45 percent of the watershed is forested, about 30 percent is agricultural, and about 17 percent rural residential or urban (LTWC 2000).

Similar to most watersheds in Oregon, land use practices over time have degraded instream conditions for fish. Streams have been channelized, diverted, and straightened, and riparian vegetation removed. This is especially true in areas subject to agricultural practices, timber harvest, and urbanization. All of these actions have resulted in impaired water quality according to DEQ (2006). Coyote Creek and the Amazon Diversion Channel are impaired by low levels of dissolved oxygen (see Section 3.5.2), and the Long Tom River is considered impaired because of high water temperatures (DEQ 2006).

Coast Fork Willamette River

The Coast Fork Willamette River is formed at the confluence of Big River and Garoutte Creek, upstream of Cottage Grove Lake in the Coast Range foothills. The watershed assessment for the Coast Fork is focused on the area below the confluence with the Row River just north of Cottage Grove (CFWWC 2005). Primary land uses in this area are agriculture, urban development, and forested (both private timber holdings and national forest). The USACE operates two reservoirs (Cottage Grove Lake and Dorena Lake) upstream of the assessment area that control over half the flow in the Coast Fork Willamette River (CFWWC 2005). The same forces described for other rivers are acting on channel structure, water quantity and quality, and riparian habitat within the Coast Fork Willamette River. The floodplain associated with this stream is found from Cottage Grove downstream to the confluence with the Middle Fork Willamette where in places, most of the river valley is within the SFHA. The associated Camas Swale Creek SFHA is likely the largest off-channel floodplain in this watershed.

Water quality in the Coast Fork Willamette River is generally considered to be meeting targets established to protect beneficial uses, including those for fish. It is, however, considered impaired because of relatively high summer water temperatures, low levels of dissolved oxygen in some tributaries, high levels of mercury, and fecal coliform contamination (DEQ 2006). Of these, temperature has the largest direct effect on fish. High summer water temperatures reduce habitat quality for species that spend the summer in the river, such as adult spring-run Chinook and juvenile steelhead. While high water temperatures directly affect fish by increasing

respiration and metabolic rates, they also decrease dissolved oxygen levels. Water temperatures are affected by a variety of human-caused landscape alterations including diversion, impoundments, removal of riparian vegetation, urbanization, and stream channelization.

Middle Fork Willamette River

The major tributaries that combine to form the Middle Fork Willamette River have their headwaters in the high-elevation Cascade Mountains at Waldo Lake and the north slope of Sawtooth Mountain. The assessment area for the Middle Fork Willamette River focused on the area downstream of Dexter Dam, about 12 percent of the overall watershed (Runyon et al. 2002). The vast majority of the entire watershed is forested. There are three major reservoirs within the lower watershed: Dexter and Lookout Point reservoirs on the Middle Fork Willamette River and Fall Creek Reservoir on Fall Creek. The only other artificial water feature in the upper watershed is Hills Creek Reservoir on the Middle Fork Willamette River. The 100-year floodplain downstream of Dexter Reservoir is relatively narrow and confined to the land immediately adjacent to the Middle Fork Willamette River. Similar to the Coast Fork and for analogous reasons, water quality in the Middle Fork Willamette River is generally considered to be meeting targets established to protect beneficial uses; however, it is considered impaired because of relatively high summer water temperatures in the mainstem and many of the tributaries (DEQ 2006).

McKenzie River

The McKenzie River meets the Willamette River just downstream of Eugene. The McKenzie River headwaters lie in the central Cascade Mountains within the Willamette National Forest. The watershed covers about 1,300 square-miles of mostly National Forest lands. There are two major reservoirs on the system, Cougar Reservoir on the South Fork McKenzie and Blue River Lake on the Blue River. Most of the watershed upstream of about Blue River is managed by state or federal agencies. Downstream of this point and in the floodplain, the watershed is mostly privately owned. Of the roughly 41,000 acres of floodplain in the watershed[11], over 90 percent is privately owned (Alsea Geospatial Inc. et al. 2000). The vast majority of the watershed is managed by the guidelines published in the Northwest Forest Plan (USFS and BLM 1994), but the privately owned floodplains are subject to local regulations that implement the NFIP. An excellent overview of the river's geomorphology is presented in the McKenzie River Subbasin Assessment (Alsea Geospatial Inc. et al. 2000), which is incorporated by reference. Primary changes to the watershed over the years have been alteration of natural flow patterns through dam construction and diversion for hydropower, channelization and bank stabilization, and removal of large wood (Alsea Geospatial Inc. et al. 2000).

[11] While most of the watershed is within National Forest, the floodplains are found primarily in relatively flatter areas of the larger valleys lower in the watershed. These areas are excellent agricultural land and therefore largely privately owned.

The McKenzie River floodplain is mostly associated with the lower gradient valleys found downstream of about Leaburg. In this area, the valley widens between the confining ridges and alluvial floodplains are formed where the SHFA occurs. As with the Coast and Middle forks of the Willamette River, the lower McKenzie River is considered impaired because of water temperatures (DEQ 2006). Degraded water quality in the McKenzie River is a result of similar reasons as other watersheds. In contrast to other watersheds, water storage and diversion are probably larger factors in the McKenzie River watershed than are urbanization and agriculture.

Species and Habitat Conditions

Lane County covers a wide array of habitat types, climatic conditions, and supports two different listed species: Chinook and coho. Because of this, the following discussion of the relationship between the species that occur in Lane County and the watersheds described above is relatively general.

Chinook

Chinook are relatively widespread in Lane County watersheds. They occur within the larger rivers including the Siuslaw and Willamette rivers and their major tributaries. Coastal populations of Chinook are not afforded ESA protection. The ESU of concern is the Upper Willamette River spring-run Chinook. Chinook occur in most of the major Willamette River tributaries at least during some portion of their life cycle.

Coast Fork Willamette River

Surveys prior to 1983 of the Coast Fork Willamette River have documented spawning of spring-run Chinook (CFWWC 2005), but the size of the population is unclear. A downstream migrant trap operated near the downstream end of the Coast Fork Willamette River resulted in capture of young-of-the-year Chinook fry, indicating that successful reproduction had occurred (pers. comm., Ziller 2011).

Middle Fork Willamette River

Use of the Middle Fork Willamette River by spring-run Chinook historically occurred before construction of the Dexter and Fall Creek dams. The watershed assessment (Runyon et al. 2002) presents evidence that some adult spring-run Chinook trapped and hauled around the dams managed to produce a few viable smolts. Even though these smolts were able to pass the downstream lakes and dams the contribution of these to the population is unclear. There are conflicting reports over timing of Chinook spawning downstream of the Dexter and Fall Creek dams (Runyon et al. 2002). Spawning surveys conducted by ODFW document very few wild fish spawning in these reaches (ODFW 2005). The watershed assessment conducted in the lower Middle Fork Willamette River indicated that habitat for fish was within the acceptable range of values for some features (pool frequency and size) and unacceptable for others (riffle width to depth ratio and large wood abundance). The dams at all of these facilities are barriers to the

upstream movement of salmonids and have blocked access to over half the pre-dam habitat (ODFW 2005). However, there is an experimental program in which ODFW traps, hauls, and releases adult spring-run Chinook above Lookout Point and Hills Creek reservoirs (pers. comm., Ziller 2011)

McKenzie River

Spring-run Chinook use the mainstem McKenzie River from the confluence with the Willamette upstream to Trail Bridge Dam (just inside Linn County). They also use most of the other tributaries up to the limit of anadromous access (ODFW 2005). Although relatively numerous, the population in recent years is over 40 percent hatchery fish (ODFW 2005). The success of the Chinook population in the McKenzie River is due in part to a good supply of cold water that provides adequate over-summering habitat. The main spawning areas in this watershed include the mainstem and South Fork McKenzie River and Horse, Gate, and Lost creeks (Alsea Geospatial Inc. et al. 2000). Channel simplification has reduced available rearing habitat for spring-run Chinook in the McKenzie River by removing side channels, large wood, and islands (Alsea Geospatial Inc. et al. 2000). Regardless of this, the McKenzie River supports an excellent population of spring-run Chinook, and the long-term population trend has been positive (ODFW 2005).

Coho

Coho are found in most coastal drainages within Lane County. They were once incredibly abundant before a combination of overharvesting, poor land use practices (especially logging), loss of habitat, and poor ocean conditions in the 1990s caused populations to crash (Ecotrust 2002). Coho remain the dominant species in most of these drainages, including the Siuslaw River. The Siuslaw River has almost 700 miles of suitable coho habitat. This population has been relatively stable with just under 10,000 fish returning on average each year (ODFW 2005). Because most of the watershed is private and federally managed timber lands, it is likely that instream habitat has been negatively impacted by logging but is still accessible to fish. No hatcheries supplement this population. Population information is not available for the smaller coastal streams that also support coho.

Interaction with Floodplain

Most of the floodplains are described above in reference to their specific watersheds. In unmodified systems, floodplains generally increase in extent from headwaters in relatively higher gradient confined canyons to wider valley floors. The headwaters of most of the rivers in Lane County are in the National Forests of the Coast Range and Cascades. Large valleys with their associated floodplains are typically found farther downstream and are often primarily privately owned. These areas have often been developed for agricultural uses or urbanized. Thus, the floodplain functions vary within the county and within particular watersheds. Agricultural areas may have reduced functions due primarily to loss of woody vegetation, but these open lands still provide valuable flood storage, off-channel habitat, and in some areas nutrient

filtering. Conversely, some livestock pastures can increase water quality problems and are limiting the fish habitat function of floodplains. Approximately 3.4 percent of the SFHA in Lane County is developed.

Listed fish in the Willamette River and other relatively large rivers use mainstem habitat primarily as adult and juvenile migration corridors, with holding (spring-run Chinook) and spawning occurring in higher elevation smaller streams. Actual fish habitat in these areas has generally been reduced to migration corridors by the removal of complex braided channels, diking and straightening, and removal of riparian forests. The historic floodplain associated with these mainstem habitats has been correspondingly reduced and is often not accessible to fish. Because of this, the interaction between fish and the SFHA is relatively limited to those areas where the floodplain remains connected to the stream in a somewhat natural fashion, and fish can access and use seasonally flooded habitats as refuge from high flow conditions.

Summary of NFIP Activities

Lane County joined the NFIP in 1985 and its initial FIRM became effective the same year. The current FIRM effective date is 1999. Lane County has more river miles of floodplain than any other county in the state, resulting in a relatively high number of LOMR-Fs, and high number of repetitive loss claims, as shown on Figures 3.5-4, -5, and -6 and Table 3.5-2. These fill activities are dispersed throughout the rural and unincorporated urban areas of the county, with many in the SFHAs of the Willamette and McKenzie rivers and their tributaries. Lane County has participated in the CRS since 2009, with a rating of 7.

Lane County implements floodplain development ordinances, as well as other overlapping regulations that affect development in floodplains, including riparian regulations and permit requirements within the Willamette River Greenway. The county does not regulate development of wetlands. However, applicants are required to obtain permits from DSL for wetland impacts. The county participates in planning efforts in coordination with four watershed councils: the Long Tom, McKenzie, Middle Fork Willamette, and Siuslaw.

Floodplain Ordinance

Lane County has two floodplain ordinances within the Lane Code (LC), one applicable to rural areas (LC 16.244) and the other applicable to unincorporated parts of the Urban Growth Boundaries (UGBs) of smaller cities (LC 10.271). The ordinances are substantively similar and implement higher regulatory standards than the NFIP minimum standards. In unnumbered A zones, structures are required to be elevated 2 feet above the highest adjacent grade. For numbered A1-30, AE, and AH zones, structures must either be elevated to 1 foot above the BFE or be flood-proofed. Development is prohibited in floodways unless a professional engineer certifies that it will not increase flood levels during the base flood discharge.

Riparian Regulations

The Lane County Riparian Regulations (LC 16.253) establish riparian setbacks and limits on the total amount of native vegetation that can be altered within the setback. The riparian setback area generally ranges from 50 to 100 feet, depending on the underlying zoning, whether the stream is located in the unincorporated portion of the Eugene-Springfield UGB, and the size of the stream.

Willamette River Greenway

The county requires a permit for most development within the Willamette River Greenway (LC 16.254), which is of variable width from the Willamette River. The Greenway permit requires a 100-foot setback from the OHWL for developments that are not water-related or water-dependent. Greenway permit approval criteria require that development be located away from the river to the greatest possible degree, that the proposal protects significant fish and wildlife habitat and preserves areas of annual flooding and floodplains, and that riparian vegetation is maintained.

Land Division

The county's Land Division Ordinance (LC Chapter 13) requires that floodplains be preserved in their natural state to the extent practicable to preserve overflow and natural functions.

3.5.4 COOS BAY

General Watershed Conditions

The City of Coos Bay is located on a peninsula surrounded on three sides by the waters of Coos Bay (Figure 3.5-7). Coos Bay is greater than 13,000 acres in size. The Coos River empties into the bay upstream of the City. Coos Bay also receives water from Isthmus and Catching sloughs as well as numerous smaller creeks.

The watershed that contains Coos Bay is a mix of open space. The edges of the city closely associated with the bay are almost completely urbanized. Pony Creek drains the central hill on the peninsula and has been dammed to form Lake Merritt (also known as Lower Pony Creek Reservoir) and Upper Pony Creek Reservoir. Both of these facilities are owned and operated by the Coos Bay-North Bend Water Board. The land surrounding the reservoirs is largely forested although areas appear to have been logged.

Most of the floodplain within the city is associated with the fringe of the bay. Other areas of SFHA extend up Blossom Gulch and Coalbank Slough on the east side of the peninsula. Although most of the Pony Creek watershed is within the City of Coos Bay, the floodplain associated with this creek is found within the city limits of North Bend just north of the City of Coos Bay.

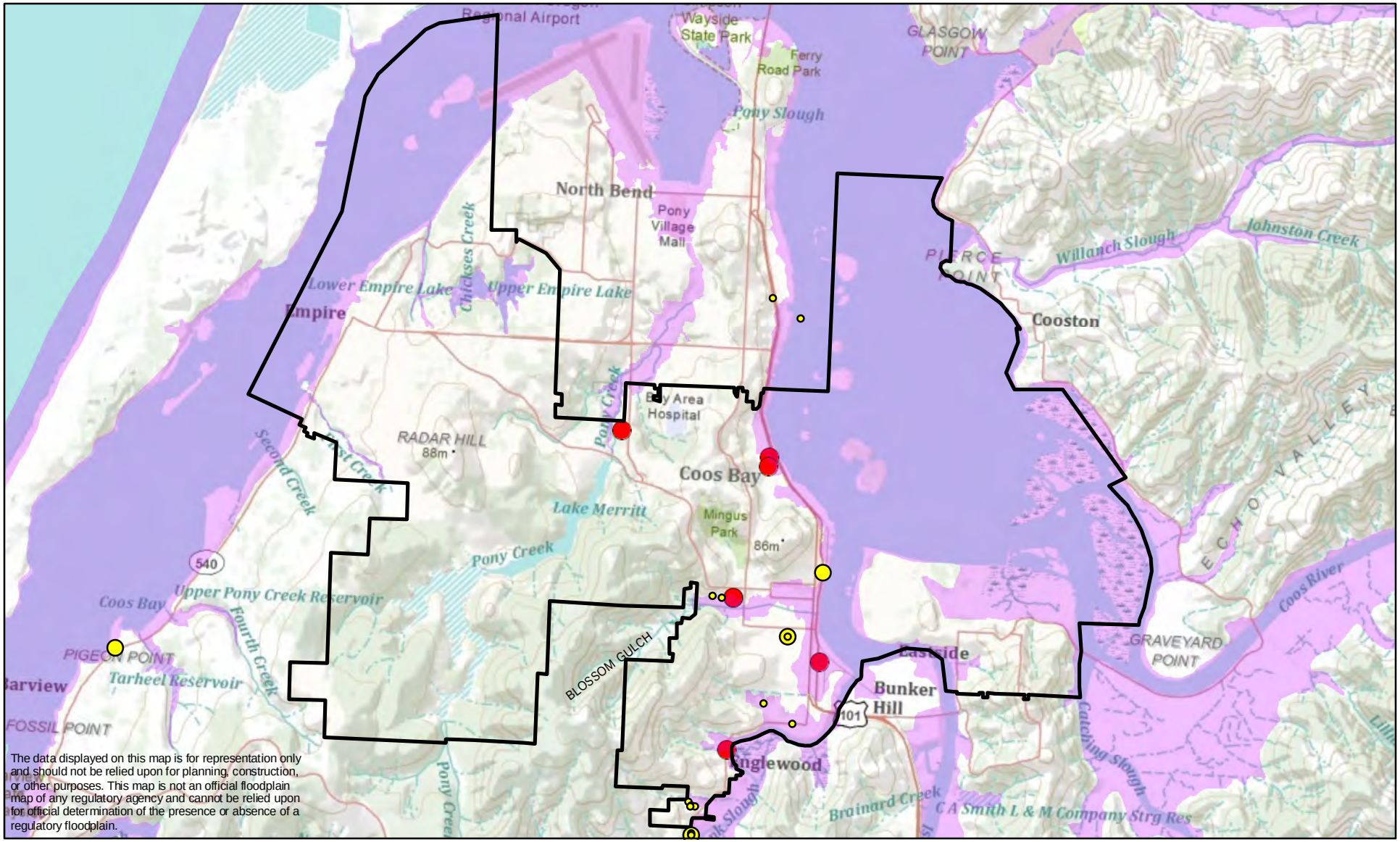


Figure 3.5-7. City of Coos Bay Depicting SFHA, Local LOMR-F Actions, and Repetitive Loss
Oregon NFIP Program Level Biological Assessment

LOMR-F
100-year Flood Zone

Repetitve Loss
1 or less
2
3-4
More than 4

N
0 0.5 1 Miles

WA
OR
ID
CA
NV

File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-5-7_City of Coos Bay.mxd

Print Date: July 11, 2011

Blossom Gulch Creek traverses through the downtown section of the city and provides little salmonid habitat. The floodplain of this creek includes a swath of the downtown developed area. The Coalbank Slough SFHA includes residential and developed areas affording little natural floodplain function.

Many small watersheds associated with Coos Bay are listed as impaired by DEQ under Section 303(d) of the Clean Water Act, but TMDLs have not been developed (DEQ 2010a). These watersheds are listed because they have, in most cases, exceeded acceptable levels for bacterial contaminants. Isthmus Slough is listed as impaired for dissolved oxygen, low levels of which impair the use of this area by fish. Concerns about poor water quality in Pony Creek (temperature, bacteria, turbidity, and sedimentation) resulted in the formation of the watershed group and assessment and action plan (LPCWC 2002). Coalbank Slough is listed as impaired because of high year-round levels of fecal coliform; Blossom Gulch is not listed as an impaired waterbody (DEQ 2010a).

Species and Habitat Conditions

The estuarine habitat that surrounds the City of Coos Bay is important for Oregon Coast coho. Populations of these fish are found in many of the smaller tributaries to the bay and the Coos River. With over 400 miles of accessible coho habitat, the Coos River supports the largest coho population on the central Oregon Coast (ODFW 2005). Although supported in part by hatchery supplementation, the wild returns have numbered in the tens of thousands in recent years (ODFW 2005). Aside from a substantial drop in the late 1990s, the overall trend in this population has been positive since 1990 (ODFW 2005). Pony Creek historically supported a small population of Oregon Coastal coho (LPCWC 2002). Fish access to the Pony Creek watershed was restored when tidegates were removed or locked open; however, coho have not been documented in the watershed (pers. comm., Gray 2011). The tributaries to Pony Creek are reported to have low summer flows that limit summer rearing and gravel that is too small to attract spawning coho (pers. comm., Gray 2011). Approximately 1.4 miles of Coalbank Slough also is within, and immediately adjacent to, the city limits (Figure 3.5-7). Open to Coos Bay, this tidal slough may provide some rearing habitat for juvenile coho and be used as a migration pathway to spawning locations in the Coalbank Creek and associated tributaries (pers. comm., Gray 2011). Blossom Gulch is a small creek that is a tributary to Isthmus Slough within central Coos Bay. Within the city, most of the creek is culverted and a tidegate controls access and flow at the downstream end; however, coho have passed through this pipe and been documented spawning in the upper Blossom Gulch watershed (pers. comm., Gray 2011).

Eulachon have been reported within Coos Bay in small numbers and green sturgeon are known to appear within the estuary (pers. comm., Gray 2011). Established runs of eulachon have not been documented, and the southern DPS of green sturgeon do not spawn in this area.

Interaction With Floodplain

As indicated above, the majority of the SFHA within the City of Coos Bay is limited to the shoreline and adjacent land of the bay and the urbanized fringe of the city around the edge of the bay. About 45 percent of the SFHA is developed. Most of the urbanized fringe provides no habitat for listed fish species. The developed areas provide little floodplain function important to fish – there is little overhanging vegetation, no off-channel habitat, an abundance of paved areas that inhibit water infiltration, and flood storage is limited. The tidal sloughs may provide habitat for fish. However, the only slough within the city limits is the western bank of Coalbank Slough, which is almost completely urbanized and therefore provides no habitat for fish. The developed areas with the SFHA have replaced natural floodplain functions and adversely affected fish habitat by removing vegetation, affecting stormwater flow and infiltration, and providing a source of non-point urban runoff pollution. An excellent example of this is Blossom Gulch, which is contained within a culvert through the city, providing essentially no fish habitat, but which is still associated with a portion of the SFHA. Thus, floodplain function in Coos Bay is very low.

Summary of NFIP Activities

The City of Coos Bay joined the NFIP regular program in 1984, with its initial FIRM becoming effective that year. An FIS was conducted in 2009 with an updated FIRM effective the same year. The City of Coos Bay does not participate in the CRS.

A moderate amount of floodplain activity has occurred in Coos Bay, including several LOMR-Fs in the developed areas of the Coalbank Slough and Blossom Gulch SFHAs and near Highway 101 on the east side of the peninsula in the Coos Bay SFHA, as shown on Figure 3.5-7. The community also has a high number of repetitive loss properties, primarily residential properties in the Coalbank Slough and Blossom Gulch SFHAs.

The City of Coos Bay implements the NFIP through its Flood Damage Prevention Ordinance. An Estuary Management Plan (Coos County 1975) has also been developed that affects development of some land within the SFHA adjacent to Coos Bay.

Flood Damage Prevention Ordinance

In 2009, the City of Coos Bay adopted their current Flood Damage Prevention Ordinance, Chapter 17.195 of the Coos Bay Municipal Code (CBMC). The ordinance implements the NFIP minimum standards and includes a provision to ensure that required state and federal permits are obtained prior to issuance of a floodplain development permit. The ordinance requires residential and non-residential structures to be elevated to 1 foot above the BFE. Manufactured homes are required to be elevated to 18 inches above the BFE. The ordinance also contains restrictions on the storage of hazardous materials and the location of critical facilities within the SFHA.

Coos Bay Estuary Management Plan

The Coos Bay waterfront is subject to provisions of the Coos Bay Estuary Management Plan, which was developed in accordance with Statewide Planning Goal 16: Estuarine Resources. The Coos Bay Estuary is designated as a "Deep-Draft Development Estuary." The plan identifies portions of the Coos Bay waterfront as Natural, Conservation, and Development Management Units. The Coos Bay Land Development Ordinance (CBMC 17.205) requires that proposed development within a designated Management Unit be evaluated against the policies of the plan. The plan places limits on the types of uses allowed within each Management Unit, with Natural being the most restrictive and Development allowing the greatest range of uses. The plan prioritizes uses such as water-dependent uses and requires mitigation for estuary impacts, such as filling or dredging.

3.5.5 CITY OF MEDFORD

General Watershed Conditions

Medford is located within the Bear Creek valley in southern Oregon. Medford is bisected by Bear Creek, which flows from southeast to northwest toward its confluence with the Rogue River about 4 miles northwest of Medford and almost 130 river miles from the Pacific Ocean (Figure 3.5-8). Bear Creek originates in the Cascade Mountains upstream of Emigrant Lake and Hyatt Reservoir. Land ownership within the Bear Creek watershed is a mix of private and federal ownership (primarily Bureau of Land Management). The valley itself, however, has been highly developed over the years, and much of this area is privately owned; the bulk of the publically owned land is found in the hills and mountains adjacent to the valley (DEQ 2007). The major urban areas include the cities of Medford, Phoenix, Talent, Central Point, Jacksonville, and Ashland.

The watershed assessment prepared for the mainstem of Bear Creek identified the following as major issues for the watershed: water supply, wildfire, development, and flooding (Horton 2001). The amount of water in the stream is altered by diversion for agricultural, municipal, and industrial use. Wildfire suppression has resulted in less frequent but higher intensity fires that have substantial impacts on the watershed and vegetation (Horton 2001).

Development of the valley floor has resulted in a confined channel with reduced amounts of riparian vegetation, off-channel wetlands, and channel complexity. This in turn has increased the frequency and severity of flooding, along with increased sediment transport and stream bank instability.

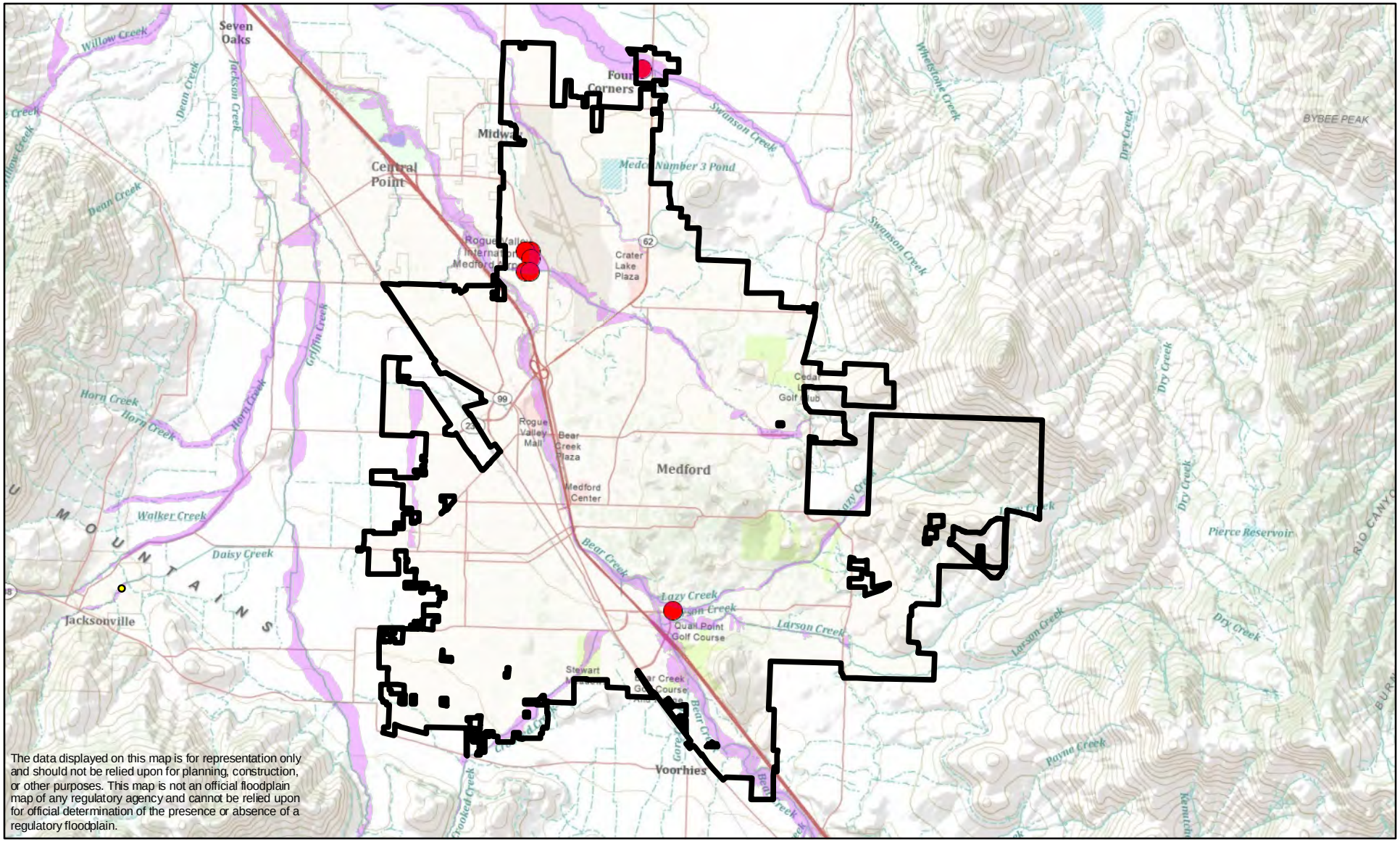


Figure 3.5-8. City of Medford Depicting SFHA, Local LOMR-F Actions, and Repetitive Loss
Oregon NFIP Program Level Biological Assessment

LOMR-F
100-year Flood Zone

Repetitve Loss
1 or less
2
3-4
More than 4

N

0 0.5 1 Miles

According to Horton (2001), the DEQ considered Bear Creek impaired for temperature, dissolved oxygen, and turbidity at different times of the year. Although the 2010 integrated water quality database does not contain any records of impairment for Bear Creek (DEQ 2010b), a TMDL was developed for pH, weeds and algae, and dissolved oxygen in 1992 (DEQ 2007, Appendix C) and for temperature, sedimentation, and bacteria in 2007 (ODEQ 2007). Bear Creek is listed as impaired for summer water temperatures for over 25 miles upstream from the confluence with the Rogue River, for 7-day average water temperatures over 18°C between May 16 and October 14 (DEQ 2007). This date range is outside the salmonid spawning season but within the rearing period. Compounding the water quality problems in Bear Creek are the extensive water diversions for agricultural use. In the summer, DEQ (2007) reports that flows are determined by irrigation deliveries, operational spill, and return water. This complicated system of water management creates mainstem habitat conditions within Bear Creek in Medford that are not suitable for year-round use by coho because water temperatures are too warm. The TMDL for sedimentation applies only to tributaries to Reeder Reservoir south of Ashland.

Species and Habitat Conditions

Although a variety of species have been observed in Bear Creek, the primary species of concern for this analysis is the Southern Oregon-Northern California ESU of coho. The population of coho in Bear Creek does not appear to be large; only 10–20 fish were found at several sample locations (Horton 2001). The mainstem of Bear Creek within Medford is in poor condition to support a substantial population of coho. Streamflows have been reduced by diversions and do not always meet the minimum flow established by ODFW (Horton 2001). This can lead to high instream temperatures and restricted access. In addition, habitat conditions have declined over time as urbanization has removed riparian habitat, simplified and channelized the creek, and created barriers to movement (Horton 2001).

The Bear Creek population of coho is a small part of the overall Rogue River population. In their assessment of the Rogue River population, ODFW (2005) indicated that the population met all the assessment criteria for sustainability. Although the overall population trend in the upper Rogue River population has been positive since 1980, there is an extreme amount of variability in both adult returns and recruits per spawner (ODFW 2005). This could indicate an unstable population. So although the overall population may be relatively stable, relatively fewer may use Bear Creek within Medford than did historically. In addition, impaired water quality issues (including low streamflows and high water temperatures as described above) create habitat that is unsuitable for year-round use by coho.

Interaction with Floodplain

The floodplain mapped within Medford is associated with Bear Creek and other minor tributaries that flow through the city (Medford 2010). Most of this channel has been straightened and confined, which combined with alterations in flow from upstream storage have removed a great

deal of the habitat complexity, floodplain function, and historically accessible floodplain from the system. Off-channel habitat and rearing areas are not available; woody recruitment, flood water storage, nutrient filtration, and fish prey input are severely restricted in the Medford floodplain. About 45 percent of the SHFA is developed. The lack of these functions in combination with water diversions are severely limiting the function of the floodplain and the corresponding fish habitat.

Summary of NFIP Activities

Medford joined the NFIP regular program in 1981, and its initial FIRM became effective that year. The current FIRM became effective in May, 2011, upon adoption of a Floodplain Protection Ordinance meeting NFIP minimum criteria. An FIS was completed in 2011 as well, establishing the SFHA. Medford has participated in the CRS since 1994 with a rating of 8.

Floodplain development activity in the city has been modest, with the majority of the recorded LOMR-Fs occurring within the last 10 years associated with commercial development in the SFHA of a Bear Creek tributary west of the Rogue Valley International-Medford Airport, as shown on Figure 3.5-8. Other recorded LOMR-Fs include those associated with a recently constructed medical center near the convergence of the Lazy Creek, Larson Creek, and Bear Creek SFHAs in a developed highway interchange area, and a development adjacent to the overcrossing of the Crater Lake Highway with Swanson Creek. Medford implements a Flood Damage Protection Ordinance, and addresses flooding issues in a Pre-Disaster Mitigation Plan. The city also has riparian corridor regulations.

Flood Damage Prevention Ordinance

In 2011, Medford adopted a Flood Damage Prevention Ordinance (Sections 9.701 – 9.707 of the Medford Municipal Code) that incorporates the NFIP minimum standards. New structures are required to be elevated to 1 foot above the BFE. The ordinance directs the floodplain administrator to ensure that all required state and federal permits are obtained prior to issuing a floodplain development permit. For developments in SFHAs where no BFE has been established, no structures or fill are allowed within 50 feet of the OHWL or the width of the stream, whichever is greater, unless a registered professional engineer establishes a BFE. The ordinance also contains restrictions on the storage of toxic materials in the SFHA and recommends avoiding locating critical facilities in the SFHA.

Pre-Disaster Mitigation Plan

In 2008, the city submitted to FEMA an updated Pre-Disaster Mitigation Plan that addresses multiple natural hazards, including floods (Medford 2008). The plan proposes several mitigation measures to prevent flood damage. These measures include pursuing public acquisition of open space within floodplains, implementing stormwater and urban design BMPs, participation in regional partnerships (including the Bear Creek Watershed Council) to reduce flood losses,

continuing to improve the community's CRS rating, and strengthening floodplain development regulations (such as by adding setbacks to additional streams).

Riparian Corridors

Medford is currently updating its Riparian Corridors Ordinance, Sections 10.920 – 10.928 of the Municipal Code. The existing ordinance was adopted in 2000. The current proposal is, as of May 2011, in the process of being reviewed by the Planning Commission, prior to hearing and adoption by the City Council.

The existing ordinance defines a riparian corridor as being 50 feet from the top-of-bank of specific portions of fish-bearing streams named in the ordinance. Prohibited uses within a riparian corridor include the placement of new structures or impervious surfaces, excavation, grading, fill, stream alteration or removal of vegetation (except for perimeter mowing for fire protection purposes), and expansion of existing non-native landscaping.

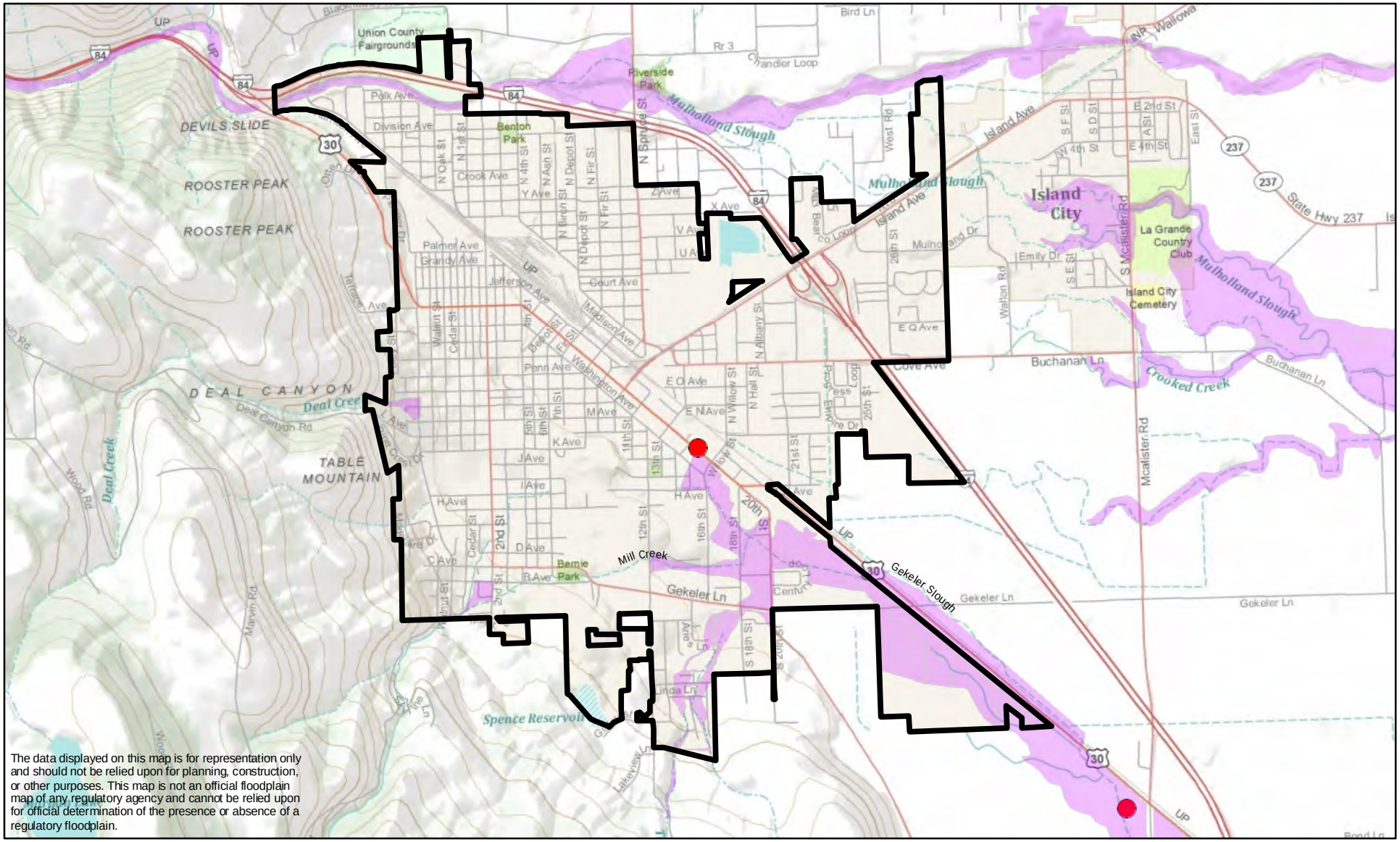
The revisions to the ordinance allow for a reduction of the riparian corridor, but in no cases to less than 25 feet, provided that restoration or enhancement or other means are employed to minimize adverse habitat or other impacts, and that the resulting corridor is protected through a conservation easement or similar long-term protection mechanism.

3.5.6 CITY OF LA GRANDE

General Watershed Conditions

La Grande is located on the western edge of the Grande Ronde Valley in eastern Oregon. The Grande Ronde River flows from west to east through the northern corner of the city. Other streams include Mill Creek, Gekeler Slough, and Mulholland Slough. The Grande Ronde has its headwaters in the Blue Mountains of the Wallowa-Whitman National Forest. The Grande Ronde watershed upstream of La Grande is undeveloped and supports a mix of grassland that grades into coniferous forest as the elevation increases (Nowak 2004). This area is relatively steep and rugged with limited amount of development or habitat modification. As the river enters the Grande Ronde Valley, the terrain is essentially flat, and land uses outside the city limits are mostly agricultural. Within the city, the watersheds of the various streams and sloughs mentioned above are almost entirely urban. Open space in the city limits appears to be associated with neighborhood parks and schools.

Floodplains in La Grande are associated with Mill Creek and Gekeler Slough in the southern part of the city (Figure 3.5-9). This floodplain is relatively extensive; the 100-year floodplain covers most of the southeastern portion of the city. On the western side of town, Deal Creek has a small area of 100-year floodplain that eventually connects to that of Gekeler Slough via Washington Avenue. SFHA associated with the Grande Ronde River is limited to an area immediately along the river itself.



The data displayed on this map is for representation only and should not be relied upon for planning, construction, or other purposes. This map is not an official floodplain map of any regulatory agency and cannot be relied upon for official determination of the presence or absence of a regulatory floodplain.

Figure 3.5-9. City of La Grande Depicting SFHA, Local LOMR-F Actions, and Repetitive Loss
Oregon NFIP Program Level Biological Assessment

LOMR-F
100-year Flood Zone

Repetitve Loss
1 or less
2
3-4
More than 4

N

0 0.5 1 Miles

WA
OR
ID
CA
NV

File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-5-9_City of La Grande.mxd

Print Date: July 11, 2011

A TMDL has been developed for the upper Grande Ronde basin (upstream of the Wallowa River) to address temperature, dissolved oxygen, and pH (DEQ 2000). Related to dissolved oxygen and pH are TMDLs for sedimentation, bacterial, nutrients, and habitat and flow modifications. Increased water temperatures are attributed to human-caused reductions in riparian shading, channel widening, riparian soil saturation, and summer flows (DEQ 2000). Nutrient loading is the primary cause of the periphyton growth, which when coupled with warm water temperatures results in daily cycles of dissolved oxygen and pH. Because of this, the TMDL establishes criteria for nitrogen and phosphate loading at both point and non-point sources (DEQ 2000). Many of the smaller tributaries in the area are listed as either attaining some criteria or lacking sufficient data to make a determination regarding a specific pollutant and the potential need for a TMDL (DEQ 2010c).

The Grande Ronde River downstream of the Wallowa River is on the 303(d) list as impaired for dissolved oxygen in January through May, during the spawning period for salmon and steelhead (DEQ 2010c). Although well downstream of the City of La Grande, salmonids moving up to La Grande must pass through this area during migration. Increased temperatures are reportedly caused primarily by removal of streamside vegetation (Butcher et al. 2010). A TMDL has not been prepared for dissolved oxygen; however, because the dissolved oxygen levels in water are directly related to water temperature, improvements in temperature should improve dissolved oxygen levels.

Species and Habitat Conditions

Two listed species are of concern in the upper Grande Ronde River and the City of La Grande: Snake River Spring/Summer-run Chinook and Snake River steelhead. The upper Grande Ronde supports a run of wild spring/summer-run Chinook (Nowak 2004). One of the more important habitat elements for the long-term survival of this species is suitable over-summering habitat. Adults spend the summer in pools before spawning, and an ample supply of cool water is important to their survival. The other critical element is adequate rearing habitat for juveniles, which typically spend a full year in freshwater. Most of the watershed upstream of La Grande likely provides more of this habitat than does any of the streams and sloughs within La Grande. The urbanization of the city has removed much of the riparian habitat, reduced channel complexity, and resulted in increased water quality issues as evidenced by the TMDLs. As a result, this area is identified as rearing and migration habitat only (Nowak 2004).

The Snake River Spring/Summer-run Chinook population is apparently very small in the Upper Grande Ronde watershed. The assessment conducted by ODFW (2005) indicated that production was extremely low, with fewer than five redds per mile in index survey sections attributed to wild fish and a correlated very low productivity. The naturally spawning hatchery component of this population is also very high, and there has been a long-term decline in the population of wild fish (ODFW 2005).

Snake River steelhead are found throughout the Grande Ronde basin, where they continue to use all accessible habitat (Nowak 2004). ODFW (2005) estimated that almost 800 miles of habitat was accessible to steelhead in the upper Grande Ronde River. This population has appeared relatively stable through time, if at very low levels (ODFW 2005). Cessation of hatchery stocking in recent years has likely reduced the overall productivity but should help preserve the wild stock. Steelhead use a variety of habitats throughout the year and even use streams that are only available for a short period of time. The models used in the watershed assessment indicate that key limiting factors for steelhead in the upper Grande Ronde are sediment and habitat quantity; for rearing fish, the most important factors are reduced channel width and reduced flow (Nowak 2004). Habitat for steelhead has been affected by the same activities that have affected salmon habitat.

Interaction with Floodplain

It is expected that most of the Chinook found in the city would be confined to the active channel of the Grande Ronde River. They may use the immediately adjacent floodplain as refuge habitat from extreme flow events, and residual pools may provide rearing habitat if they remain connected to the main channel. Most of the floodplains within the City of La Grande are highly urbanized and provide no habitat value to fish. Chinook would not be expected to occur in these smaller creeks and sloughs, but steelhead could move through them on their way to and from spawning areas upstream of the city. Floodplain function within the city has been severely disrupted over the past 150 years from diking, land clearing, and urbanization. About 50 percent of the SFHA is developed. Limited fish refuge and off-channel habitat are available in the floodplain, shading and woody material recruitment are limited, as is flood water storage capacity.

Summary of NFIP Activities

The City of La Grande entered the NFIP regular program in 1980, with its initial FIRM becoming effective the same year. The current FIRM is effective as of 1996. The City of La Grande does not participate in the CRS. The City has experienced a very low level of floodplain activity, as shown on Figure 3.5-9.

The City of La Grande regulates development within floodplains through a Floodplain Protection Ordinance contained in the city's development code. Related regulations include riparian protection and wetland ordinances.

Floodplain Ordinance

The City of La Grande's floodplain ordinance (Article 3.12 of the City's Land Development Code) regulates development within SFHAs that were established by the FIS conducted in 1996.

The ordinance generally implements the NFIP minimum standards, except that structures (including manufactured homes) are required to elevate the lowest floor to 1 foot above the BFE.

Riparian Protection Area Ordinance

The purpose of the City of La Grande's Riparian Protection Area Ordinance (Article 3.9 of the Land Development Code) includes the protection of water quality, minimizing damage to property from flooding, and the maintenance and enhancement of fish and wildlife habitat, by providing protective measures for the riparian area of the Grande Ronde River, defined as being 100 feet from the top of bank. Grading or placement of structures or impervious surfaces is prohibited in the riparian area, with the exception of certain uses, including streets, water-related or water-dependent uses, and maintenance of existing shoreline stabilization or flood protection structures. The ordinance limits the removal of riparian vegetation with some exceptions, and requires mitigation to be reviewed by ODFW for certain permanent alterations within the riparian area.

Wetland Protection Areas Ordinance

The stated purpose of the city's Wetland Protection Areas Ordinance (Article 3.19 of the Land Development Code) includes the protection of fish and wildlife habitat as well as to reduce the effects of flooding. A 25-foot buffer is required from the edge of a wetland. The ordinance prohibits grading and filling, the placement of new structures or impervious surfaces, the expansion of landscaping with non-native species, and the discharge of untreated stormwater. Applications for a permit for development in a wetland protection area require that the wetland be protected through a conservation easement or other mechanism that ensures its long-term protection. Applications for permits require DSL notification.

3.5.7 UMATILLA COUNTY

General Watershed Conditions

The major rivers in Umatilla County addressed in this section are the Columbia, Umatilla, and West Little Walla Walla rivers (Figure 3.5-10). The largest tributaries to the Umatilla River are Birch, McKay, and Butter creeks.

Columbia River

The Columbia River forms the northern border of Umatilla County. Much of this area is open space or used for irrigated agriculture. The only large urbanized area is the complex of Umatilla, McNary, and Hermiston, all closely associated with McNary Dam on the Columbia River. Very little floodplain is associated with the Columbia River in this area, likely a function of how flows are controlled by the major Columbia River dams. Water quality in the Columbia River within Umatilla County is generally acceptable for use by salmonids.

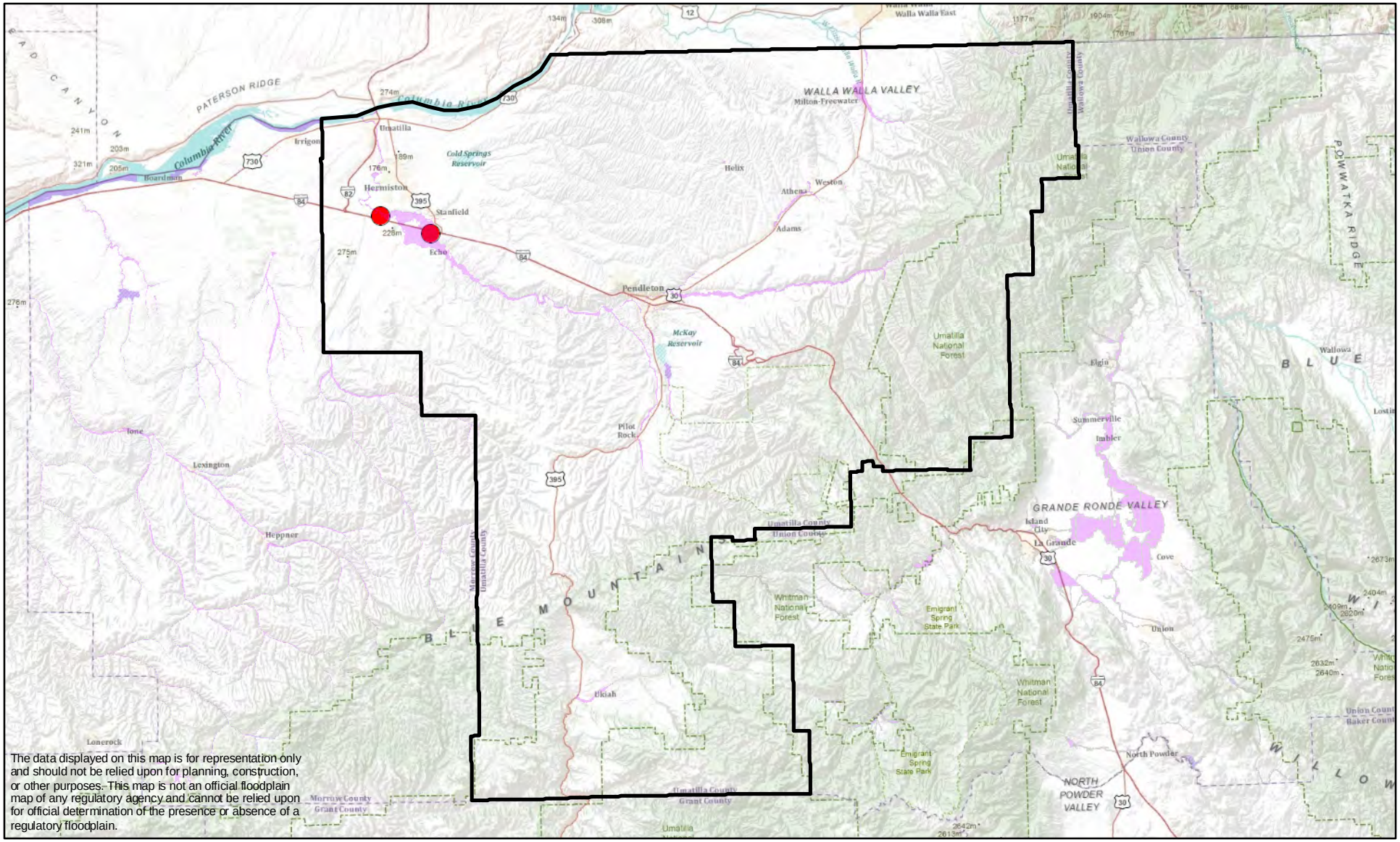


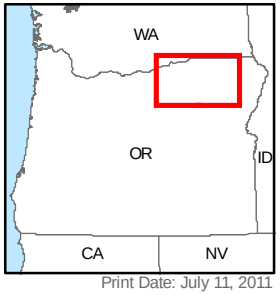
Figure 3.5-10. Umatilla County Depicting SFHA, Local LOMR-F Actions, and Repetitive Loss
Oregon NFIP Program Level Biological Assessment

LOMR-F
100-year Flood Zone

Repetitve Loss
1 or less
2
3-4
More than 4

N

0 2.5 5 10 Miles



File: P:\2010\10100417_01BAOregonNFIP\06GIS\6.3Layout\2011\BA_Figures\Figure 3-5-10_Umatilla County.mxd

Print Date: July 11, 2011

The main concern relates to high levels of total dissolved gas that result from spill of water over hydroelectric dams where levels of dissolved gas can become supersaturated. High levels of total dissolved gas can cause a wide array of damage (e.g., bleeding, embolisms, tissue necrosis) to fish. A TMDL has been developed by DEQ and the Washington Department of Ecology (Ecology) to address this issue (Pickett and Harding 2002). McNary Dam is within Umatilla County just under 3 miles upstream of where the Umatilla River meets the Columbia River. Long-term solutions to this problem will likely require modification of McNary Dam (Pickett and Harding 2002).

Umatilla River

The Umatilla River flows from its headwaters in the Blue Mountains to the Columbia River just downstream of McNary Dam, draining about 2,500 square-miles of land. Butter Creek drains the most area of any tributary (over 460 square-miles). Most of these streams flow from the rugged canyons of the Blue Mountains onto the relatively flatter terrain of the plateau. Over time, the increased use of the land for crop production and livestock grazing has occurred over much of the plateau as populations increased and transport of products became more efficient. Local urbanization in the northwestern part of the county and diversion of water from the Columbia for irrigated agriculture have substantially changed the area along the Columbia River. The original sagebrush and bunchgrass prairie has been restricted to small areas (Maudlin 2000).

The largest area of SFHA mapped on the Umatilla River expands to the south of the river channel downstream of the town of Echo before contracting back to the river channel just upstream of the confluence of Butter Creek. The south side is bounded by the Hunt Irrigation ditch. There are also areas of SFHA mapped along most of the river channel.

In the Umatilla River, water temperatures are generally high from late spring through early fall (Maudlin 2000). High temperatures are exacerbated by low streamflows, loss of riparian vegetation, high width-to-depth ratio (which creates shallow water), and high ambient air temperatures. As a result, the Umatilla River was listed on the 303(d) list as impaired not only for temperature but also for sediment, aquatic weeds and algae, nitrates, ammonia[12], and bacteria (DEQ 2001, 2010d). DEQ and other stakeholders developed a TMDL and water quality management plan to address these issues (DEQ 2001). The TMDL establishes loading limits, points of compliance, and attainment standards. These water quality issues are all interrelated. For example, high water temperatures, low flows, and high nutrient loads create excellent growing conditions for aquatic weeds and algae. This can in turn causes problems with dissolved oxygen as plants use oxygen in the water and decay of dead plant material creates high levels of biological oxygen demand.

[12] Ammonia loading is primarily from wastewater treatment plants in the lower Umatilla River watershed (DEQ 2001).

Walla Walla River

The Walla Walla River drains over 1,700 square-miles, roughly three-quarters of which is in the state of Washington. It flows from its headwaters in wilderness areas of the Blue Mountains through the same plateau area as the Umatilla River before leaving Umatilla County and Oregon just downstream of Ferndale. The Walla Walla River eventually enters the Columbia River just downstream of Wallula, Washington. Historically, downstream of Milton-Freewater the river divided into several distributaries. The smaller distributaries were eventually disconnected from the northernmost channel that became the mainstem Walla Walla River (DEQ 2005). Much of this channel network remains in place today and is part of the irrigation water distribution system during the growing season (DEQ 2005).

The bulk of the Walla Walla River watershed is privately owned and used for agriculture (WWC 2004). Review of aerial photographs indicates that downstream of about Milton-Freewater, the primary land use is irrigated agriculture. Upstream of Milton-Freewater to about the base of the foothills of the Blue Mountains, the primary land use is pasture or dryland farming. Even in areas where the bulk of the land is not irrigated, some irrigated land can be found immediately adjacent to streams, likely all on the floodplains. Small remnant areas of native prairie grassland remain in areas unsuitable for agriculture (WWC 2004). The lower foothills of the Blue Mountains are mostly grassland, which grades into scrub and brush and eventually forested areas as elevation increases. Riparian areas are generally narrow and confined to areas immediately adjacent to the streams, although DEQ reports them as being substantial in some areas (DEQ 2005).

Most of the town of Minton-Freewater appears to be within the 100-year floodplain from about the confluence with Couse Creek downstream. The floodplain is a fan shape that starts as the Walla Walla River leaves the foothills. As the terrain continues to flatten, the floodplain fans out, eventually reaching the 500-year level in the agricultural lands downstream of Minton-Freewater.

Flows in the Walla Walla River are low in the summer because in part that is the natural hydrograph pattern. However, diversion for municipal and agricultural use has also resulted in less water in the rivers. Most of the Walla Walla River is listed on the Oregon 303(d) list as impaired because of high water temperatures (DEQ 2010e). The criterion used for this was a 10°C threshold for bull trout and when the salmonid rearing threshold is applied, only about 10 miles are listed as impaired (DEQ 2010e). Other listings include flow, pesticides, pH, bacteria, and nitrates. DEQ has developed a TMDL and water quality management plan to address the temperature problems (DEQ 2005). Recent work between state and federal agencies and private landowners and water management groups has resulted in summer flows in the previously dewatered mainstem Walla Walla River downstream of Milton-Freewater (DEQ 2005).

Species and Habitat Conditions

The Columbia River within Umatilla County provides a migratory pathway for salmon and steelhead on their way to the upper Columbia and Snake River basins. While these species migrate through as adults and juveniles, the county contains no spawning habitat for any of these species.

Although a variety of salmonids including fall and spring-run Chinook and coho exist within the Umatilla River, most of these are supported by the Umatilla Hatchery located on the shores of the Columbia River. This hatchery releases fish at various facilities within the Umatilla River. The population of primary concern for this analysis is the mid-Columbia River ESU of steelhead. Steelhead are widely distributed in the basin, with more than 400 miles of stream estimated as accessible (ODFW 2005). The main areas of year-round use are Birch Creek upstream of its confluence with the Umatilla near Pendleton and the mainstem Umatilla River from about Mission Creek upstream and all of Meacham Creek (Maudlin 2000). Conditions within the mainstem channel downstream of Mission Creek are reported as unsuitable for year-round use, separating the population in Birch Creek from that upstream (Maudlin 2000). Juvenile steelhead have been found rearing in Butter Creek in the lower watershed, but the stream does not apparently support a spawning population and is separated from the upper Umatilla River by about 40 miles of stream that is unsuitable in the summer because of low flows and high water temperatures (Maudlin 2000).

The steelhead population in the Umatilla River watershed appears relatively stable if at a lower level than was historically present. ODFW reports a 30-year average return of about 1,700 adults at Three Mile Dam; however, in recent years over 30 percent of those fish are of hatchery origin (ODFW 2005)

Within the Walla Walla River, summer steelhead are relatively widespread having access to over three quarters of the historically accessible watershed with spawning and rearing habitat found throughout the basin (ODFW 2005; WWC 2004). The metrics used to assess this population indicate that it appears to be relatively stable and productive over the period for which data are available (ODFW 2005). Limiting factors for steelhead in the Walla Walla River include habitat quantity and quality, flow, temperature, sediment loads, and obstructions (WWC 2004).

Interaction with Floodplain

The use of floodplains by fish in the Umatilla and Walla Walla rivers is likely somewhat different than in the other rivers addressed in this analysis. Prior to levee construction, channel modifications, and reservoir construction, floodplains were likely accessed temporarily as refuge from high flows. The hydrograph pattern of very low summer flows would not tend to support longer term access to floodplain habitat. About 7.8 percent of the SFHA is developed. Because much of the county is rural with substantial tracts of farmland interspersed with more densely

developed cities, floodplain functional condition varies. In more rural areas, farmland adjacent to surface waters may provide riparian vegetation strips along creeks and rivers that, while providing diminished floodplain function, provide relatively more function than more densely developed areas. Flood water storage and ground water recharge, woody debris recruitment, and some off-channel habitat functions are offered by these more rural areas. Conversely, the Umatilla and Walla Walla rivers have water quality concerns from nutrient inputs and water diversion – neither of which is associated with NFIP development.

Summary of NFIP Activities

Umatilla County has participated in the NFIP regular program since 1978, with its initial FIRM adopted that year. The current FIRM effective date is 2010. Umatilla County does not participate in the CRS. Umatilla County has experienced a low level of floodplain activity, with only two recorded LOMR-Fs, both in the Umatilla River SFHA.

Umatilla County applies a Flood Hazard Overlay Zone that implements NFIP standards. The county has developed a Natural Hazards Mitigation Plan that addresses flooding (Umatilla County 2009). The county also applies a Natural Area Overlay Zone that contains additional protections for riparian areas, wetlands, and other habitat for rare or endangered species.

Flood Hazard Overlay Zone

Umatilla County applies a Flood Hazard Overlay Zone (Sections 152.351 – 152.359 of the Umatilla County Development Code) to the SFHA, which is based on an FIS performed in 2010. The Flood Hazard Overlay Zone meets the minimum criteria of the NFIP, with the addition of several higher regulatory standards. The Overlay Zone outlines responsibilities of the Floodplain Administrator. This includes a provision to review Floodplain Development Permit applications to ensure that appropriate permits have been obtained, where required by state or federal law, including the ESA. For developments proposed in A zones where no BFE has been established, no structures or fill are allowed within 50 feet of the OHWL or the width of the stream, whichever is greater, unless a registered professional engineer establishes a BFE. The lowest floor of any structure is required to be elevated to 2 feet above the highest adjacent grade, where no BFE has been established, or 1 foot above the BFE, when a BFE has been established. The Overlay Zone contains restrictions on the storage of toxic materials and petroleum products in the SFHA and standards for flood-proofing of storage tanks. The Overlay Zone recommends not placing critical facilities within the SFHA where possible or, where it cannot be avoided, elevating the lowest floor to 2 feet above the BFE or to the elevation of the 500-year flood, whichever is higher.

Natural Area Overlay Zone

The Umatilla County Development Code contains a Natural Area Overlay Zone (Sections 152.470 – 152.475 of the Development Code) that applies to areas that are habitat for rare or

endangered species, wetlands, and areas within 100 feet of the OHWL. The Natural Area Overlay Zone allows those uses that would be allowed by the underlying zoning, provided that filling, drainage, vegetation removal, or other alteration that would reduce the ecological value of a significant natural area do not occur. The Overlay Zone allows the county to review proposals for development to ensure the protection of ecological values. Proposals for dwellings or subdivisions within the Overlay Zone require coordination with the ODFW.

Natural Hazards Mitigation Plan

In 2009, the county completed a Natural Hazards Mitigation Plan (Umatilla County 2009), which addresses flood hazards and updated an earlier plan. The revised plan includes several flood protection and mitigation actions. The county completed its earlier 1997 Flood Plan (Umatilla County 19977) using funds obtained from HUD after experiencing the significant county-wide flood events of 1996/1997. The uncompleted flood protection measures identified in that plan are carried forward to the current plan. The current plan also identifies additional actions. One action is to develop the Flood Hazard Overlay Zone ordinance described above, which implements NFIP minimum standards as well as some higher regulatory standards and best practices. Other items include working with landowners to secure conservation easements within floodplains, and to provide riparian planting of these areas, mapping and outreach activities, upgrades to existing levees, and prioritization of bridge improvements where existing bridges exacerbate flooding problems.

4.0 Analysis of Effects

This section describes how the proposed changes to NFIP implementation in Oregon, as defined in the Proposed Action, would affect floodplains and fish under NMFS jurisdiction. The narrative structure is parallel to the description of the watershed and regulatory conditions for example communities. Example communities are used to explore the changes in how local jurisdictions would have to implement the NFIP. This programmatic analysis provides a good overview of the expected effects on local communities and how this can be extrapolated to the range of participating NFIP communities within Oregon.

4.1 METHODS

The three elements that potentially affect floodplains and fish are analyzed for each example community. These elements are the Mapping Program, Floodplain Management, and the CRS. Within each community narrative, a comparison is made of how the local jurisdiction currently implements the NFIP, how this will change under the Proposed Action, and what effects on floodplains and fish are anticipated from these changes. Many of the changes are procedural and involve additional coordination and monitoring by the local communities, with oversight from FEMA Region X staff. Recognizing that these changes require increased coordination with local communities, education, and monitoring, a subsection describes the effects of the time lag between the present and when implementation of the new policies is complete.

4.2 ASSUMPTIONS

Assumptions for this analysis are:

- This is a programmatic approach to impact analysis using example communities.
- Effects on floodplains and fish for the example communities can reasonably be extrapolated to participating NFIP communities across Oregon.
- All NFIP effects are indirect effects, as defined by the ESA. FEMA does not make local land use decisions but can affect these decisions through NFIP implementation. The actions are taken by third parties.
- The analysis covers only FEMA actions with a nexus to the NFIP discretionary actions of the Mapping Program, Floodplain Management, and the CRS.
- FEMA's jurisdiction extends to actions only within the SFHA.
- All participating communities elect to remain within the NFIP.
- Land use actions that occur within the floodplain but have no nexus with the NFIP (e.g., vegetation removal with no fill) are not under FEMA's purview and are not analyzed.
- Extrapolations of past trends are used to estimate future trends.
- LOMR-Fs assume the whole property was removed, although that is generally not the case.

4.3 INDIRECT EFFECTS

There are no direct effects from the proposed changes to NFIP implementation in Oregon. FEMA is not directing any land use changes or actions in the floodplain – these are at the discretion of the local community. Thus, all effects under the Proposed Action are considered indirect effects and are analyzed under this heading.

The changes to NFIP implementation are described in the Proposed Action in Sections 2.4 and 2.5. Some of these actions are the sole responsibility of FEMA and involve internal process changes. Others require individual communities to institute changes in how they implement the NFIP, particularly dealing with the analysis of effects on ESA-listed species and FEMA and NMFS coordination. Those elements implemented primarily by FEMA are described first in a statewide context (Section 4.3.1). This is followed by a description of the elements implemented by communities, using the selected example communities as the basis for analysis (Sections 4.3.2 to 4.3.9).

4.3.1 STATEWIDE ELEMENTS

The statewide elements that FEMA will implement (see Section 2.5.2) with minimal community involvement include revising mapping study priorities, modeling protocols, and incorporating of ESA species information. Providing mitigation through technical assistance and monitoring of the Oregon NFIP communities is also addressed under this heading. Table 4.3-1 summarizes all of the major change elements – shaded ones are described here, and unshaded ones (which will occur on the local level) are described under the example communities section that follows.

Table 4.3-1. NFIP Elements and Resulting FEMA Action as Implemented in Oregon (shading indicates FEMA statewide elements).

Section Reference*	Element	Action
Mapping		
2.5.1	**Mapping**	
	-1A: CLOMCs	CLOMCs will be denied unless ESA compliance demonstrated.
	-1B: Mapping Priorities	ESA species and habitat to be considered when prioritizing Flood Insurance Studies.
	-1C: Modeling	Guidance to be provided for modeling used in hydraulic and hydrologic studies that considers future changes due to land use change or climate change.
Floodplain Management Criteria		
2.5.2	Implementation of Regulations	-
	-Requirement to obtain permits prior to issuing floodplain development permit	Communities required to implement element.

Section Reference*	Element	Action
	-2A. Limitations of development/ adverse effects in RBZ and floodway	Communities required to implement element.
	-2B. RBZ width of 50 – 170 ft	Communities required to implement element.
	-2C. Mitigation for adverse effects on floodplain functions	Communities required to implement element.
Community Rating System		
2.5.3	CRS	Volunteer program - additional credits available to participating communities for habitat protection.
Administration/Other		
2.5.4	Floodplain Mitigation Activities	Require communities to assess impacts, and provide mitigation where necessary. Provide guidance, technical assistance, and outreach to communities regarding habitat and effects analysis.
2.5.5	Monitoring and Adaptive Management	Provide guidance, technical assistance, and outreach to communities; prioritize CAVs, CACs, and enforcement actions based on presence of ESA species and other risk factors; incorporate into the JPA process
* Numbers refer to sections within Chapter 2 where the specific elements of the Proposed Action are discussed in detail.		

Mapping and Modeling

This element would add listed fish and their habitat as factors to consider in approving LOMC's, prioritizing flood insurance studies, and providing more specific data to guide the appropriate model use when mapping floodplains and identifying risk.

This change in the mapping process would help protect species as floodplain maps are updated and provided to local communities. Proposed changes to the FIRM for proposed removal of properties from the floodplain due to development would be required to undergo a separate Section 7 ESA review prior to FEMA approval. Areas with critical habitat or with important spawning areas, for instance, would be given consideration for priority in mapping studies compared to the current procedures. With up-to-date maps, local communities can more appropriately manage the floodplains within their jurisdiction, including areas used by listed fish. Overall, these elements would not result in immediate changes but would contribute to better-informed management decisions in the long term. Similarly, modifications to modeling efforts will incorporate ESA concerns as a topic of analysis and long-term floodplain management. Implementation of this element would provide a long-term benefit from the existing baseline for listed species habitat and listed fish species throughout Oregon.

Floodplain Mitigation Activities

FEMA's role in implementing this element is to provide technical assistance, guidance, and oversight. An intense level of activity is expected during the implementation phase of the Proposed Action when local communities will need guidance from FEMA on how best to address the new requirements. It is expected that FEMA will follow a similar general outline of how it proceeded in Washington with changes to the NFIP by providing website information, holding workshops, conducting community outreach, and working closely with the communities. Communities are required to specifically log their floodplain activities, the nexus with the NFIP, and how they met the requirements of the new NFIP ESA elements.

It is important for local communities to understand the concept of "effects" under the ESA and how this applies to the NFIP and their land use decisions, how habitat assessments must be conducted with scientific rigor as required under the ESA, and the process steps they must comply with under these new implementation measures. FEMA's role would ensure that local communities have the appropriate tools to evaluate impacts on floodplains and associated listed species as development proposals are made. Technical elements will not be successfully implemented without such continued support by FEMA. Following the initial phase of coordination, it is expected that FEMA will continue its outreach to communities through its standard community interactions within the bounds of NFIP coordination. A coordinated effort between FEMA and NFIP communities will provide for an accurate assessment of potential effects from local land use actions, allow long-term corrective and preventive actions, develop appropriate mitigation as needed, and minimize adverse effects on listed species and designated critical habitat. Implementation of this element would provide a long-term procedural benefit over the existing baseline. Adverse effects may still occur at the individual site level due to residual and short-term effects, but communities will assess these effects and address them with mitigation.

Monitoring and Adaptive Management plus Oregon-specific Adaptive Management

The common thread through this element and the Oregon-specific monitoring and adaptive management measures is an extensive program of community involvement. This includes community assistance contacts and visits (CACs and CAVs), development of a community assistance program, and other outreach and education efforts. Priorities for outreach actions will be at least partially set based on the presence of listed species and habitats. Violations of required actions would result in enforcement actions that include probation status for a community and reporting the violation to NMFS for enforcement under the ESA.

By focusing their outreach efforts on communities where listed fish and designated critical habitat are found, FEMA will help ensure that compliance with the ESA is occurring at a local level. This action will address communities with the most sensitive resources early in the

implementation process and minimize the risk of ongoing impacts. There could continue to be adverse effects on listed fish as FEMA initiates the outreach and education process. Over the long term as communities bring local regulations into full compliance, the monitoring and management actions taken by FEMA will ensure that the regulations providing protection for listed species and designated critical habitat are being followed. Long-term monitoring will be incorporated into FEMA's regular monitoring program for continued community participation. Implementation of these long-term coordination and monitoring efforts will provide benefits to floodplain management and a corresponding benefit to fish and fish habitat compared to the baseline.

4.3.2 STANDARD COMMUNITY IMPLEMENTED ELEMENTS

This section provides a programmatic analysis of the effects of the new NFIP program elements, using the example communities described in Section 3.6. Several elements of the new requirements to be implemented by the local communities would have the same effects on listed species and critical habitat; these elements include coordination of LOMC compliance, the CRS, and Floodplain Management/Administrative recordkeeping, and are described first in the narrative. Where specific differences between the example communities are known (especially for the CRS), they are included in the description under specific example communities.

Mapping – LOMC

This element addresses mapping changes that are not required for a conditional approval by FEMA (CLOMC) as stipulated in Procedural Memorandum 64 (PM 64) (FEMA 2010b). The primary LOMC of interest is a LOMR-F, which deals with fill in floodplains. While only a procedural step, the underlying force of this element is to require a thorough science-based analysis of any proposed fill placement in the floodplain, effects of such actions on listed species and critical habitat, and provisions of appropriate mitigation as necessary to compensate for loss of floodplain habitat function.

It is difficult, if not impossible, to accurately gauge the benefit that this element would produce among the example communities and throughout the state. FEMA data on the extent of fill are not digitized and provide only point data for a LOMR-F. Application forms do not list the area of fill, only the meets and bounds of the area. Thus, trying to quantify the amount of fill that occurred in a community for a period of time is not practicable.

Under the assumption that some percentage of fill activity occurred that did not meet the new standards, application of the performance standards in the Proposed Action for all development involving fill (and associated map change) will provide a benefit for listed species and critical habitat in Oregon compared to the baseline. However, the number of LOMR-Fs is extremely small compared to the amount of available floodplain lands. On a program-wide basis, the effects of this action would be negligible. On a site-specific basis, the effect would vary from no effect

to likely to adversely affect, including beneficial for certain types of projects (e.g., habitat restoration).

Community Rating System

CRS is a voluntary FEMA program where communities can receive discounts for insurance rates based on scores for comprehensive floodplain management. Elements for ESA protection have been added to this program as a result of the changes in the Washington NFIP elements. These elements are applicable to Oregon and will provide for additional incentives for communities to manage floodplain resources in a manner that benefits listed fish and critical habitat. Because the program is voluntary, it does not necessarily apply to all NFIP communities. In addition, communities that currently participate in the CRS have no requirement to continue to do so, but the reduced cost of flood insurance is an attractive incentive. Overall, it is expected that implementation of the revised CRS standards will provide a benefit to ESA-listed species and critical habitat in Oregon compared to the baseline.

Floodplain Activities - Administrative

While oversight of this element is the primary responsibility of FEMA, local communities will be required to assess effects of their floodplain actions and ensure that they are meeting ESA compliance, documenting this, and providing a review of any related events with FEMA during standard program reviews. Although communities will be ultimately responsible for implementation of these measures, FEMA will provide guidance in implementation. Many of the new NFIP elements will initially require a coordinated effort by FEMA and the communities, with assistance from DLCD. Implementation of the new requirements for ESA compliance and associated record keeping will provide a benefit for listed fish and their habitat compared to the baseline. It will also provide for a structured approach to monitoring and compliance, and ensure adherence to ESA requirements associated with this program level consultation.

4.3.3 CITY OF FAIRVIEW

Community-Specific Implementation of the Floodplain Management Criteria

To meet the standards under the Proposed Action, the City of Fairview will be required to institute multiple changes to their implementation of the NFIP and related regulatory programs (Table 4.3-2). The most significant changes will be the implementation of the proposed minimum floodplain development regulations. Specifically, the city needs to incorporate additional standards for the issuance of floodplain development permits, limitation on development in the floodway and RBZ, assessing functional habitat elements and requiring appropriate mitigation.

Other Proposed Action elements that may affect the city's NFIP implementation include tracking floodplain development permits. The city does not currently participate in the CRS. Should the city choose to do so, it may seek credits for habitat protection.

Table 4.3-2. NFIP Elements and Resulting Action by the City of Fairview.

Section Reference*	Element	Fairview Action
Mapping		
2.5.1	Mapping	
	-1A: LOMCs	Community must ensure ESA compliance prior to issuance of floodplain development permit.
Floodplain Management Criteria		
2.5.2	Implementation of Regulations-	
	-Requirement to obtain permits prior to issuing floodplain development permit	Community must ensure ESA compliance prior to issuance of floodplain development permit.
	-2A. Limitations of development/ adverse effects in RBZ and floodway	Current riparian buffers require permits for alterations within buffers, minimization and mitigation required; may need to revise language to match proposed standards.
	-2B. RBZ width of 50 – 170 ft	Current 50-foot buffer may meet minimum standard if supported by BAS.
	-2C. Mitigation for adverse effects on floodplain functions	Need to incorporate specific no net loss/beneficial gain mitigation standards.
Community Rating System		
2.5.3	CRS	Fairview does not participate in the CRS, but could see potential changes if they choose to participate.
Administration/Other		
2.5.4	Floodplain Mitigation Activities	Community must log floodplain development and assess impacts.
* Numbers refer to sections within Chapter 2 where the specific elements of the Proposed Action are discussed in detail.		

The city currently enforces a Floodplain Protection Ordinance as well as other regulations affecting development in floodplains found in their Significant Environmental Concern (SEC) Overlay, Wetland and Riparian Buffer Overlay, and subdivision ordinances. The most significant potential revisions are described below.

Floodplain Permits

The city's Floodplain Protection Ordinance currently gives authority to the city to ensure that other required state or federal permits are obtained prior to issuance of a floodplain development permit. The ordinance would need to be revised to reflect the performance measures of the Proposed Action prior to issuance of a floodplain development permit. The variance criteria in the Floodplain Protection Ordinance would also need to be modified to include a standard for the avoidance of habitat impacts should a variance be issued.

The city currently implements a compensatory storage requirement for fill in the floodplain.

Protected Area

The standards under the Proposed Action would require that a protected area be established that includes the floodway and a riparian buffer zone (RBZ). The city currently requires 50-foot riparian buffers in their Wetland and Riparian Buffer Overlay Ordinance. This buffer may meet the minimum standard if supported by the BAS. Because of the small size of the surface water features within the city, it does not appear there would be a significant increase in the protected zone outside the current 50-foot riparian buffer.

The current RBZ regulations require permits for alterations within buffers and minimization of and mitigation for any impacts. The city will need to review the scientific basis for their existing regulations and may need to revise this language to match the standards under the Proposed Action (i.e., only short-term impacts allowed when associated with functionally dependent uses or habitat restoration or enhancement).

Habitat Assessment and Mitigation

The city needs to incorporate more specific and stringent requirements for the preparation of a Habitat Assessment and for mitigation for any impacts for development in the floodplain. The city must also ensure that the mitigation standards apply to the expansion of an existing structure footprint greater than 10 percent. These standards could be incorporated in the Floodplain Protection, SEC, or Wetland and Riparian Buffer Overlay ordinances or a separate ordinance.

Fish Impact Analysis

The only area where listed species (Lower-Columbia, Fall, Late-fall, and Spring-run Chinook; Columbia River chum, Lower Columbia Steelhead, Southern DPS green sturgeon, and eulachon) and designated critical habitat occur in Fairview is along the Columbia River waterfront (Section 3.5.1). While there is SFHA associated with Fairview and Arata creeks, these are tributaries to Columbia Slough and well above a barrier that prevents anadromous fish access.

Of the LOMR-Fs completed in the city, none appear to be in areas where they would have a direct effect on listed species or designated critical habitat (Figure 3.5-2). However, indirect effects can be attributed to fill in floodplain through the cumulative deterioration of water quality, increased runoff, and reduction of organic input. Given the number of LOMR-Fs issued to the community since 1990 (15) and assuming the same level of anticipated fills in the future (mostly residential small parcels), the effect on species and habitat would be small relative to the size of the floodplain.

Currently, approximately 35 percent of the city's floodplain is developed. Existing city regulations would allow for additional development within the SFHA without specific requirements for impact assessment, habitat avoidance, or mitigation that specifically addresses

the needs of federally listed fish. The following describes how the Proposed Action would change the existing regulations and the results that action would have on listed fish (Table 4.3-3).

Table 4.3-3. Summary of Existing Regulatory Conditions in the City Of Fairview, Changes that Could Occur Under the Proposed Action, and Effect Such Changes Could Have on Listed Fish and Designated Critical Habitat.

Proposed Action Element	Existing Conditions	Proposed Action	Resulting Fish Effects of Proposed Action
Section 2.5.2 Regulation Implementation	• Flood protection ordinance ensures state and federal permits are obtained • 50-ft RBZ • Minimization, mitigation, and permit required for modification	• Must document ESA compliance • RBZ may meet minimum, otherwise 170 ft • Update existing to match standards • Requires mitigation • Requires avoidance of habitats	• Long-term benefit • Potential site-specific adverse effects

Projects in the Columbia River SFHA would be required to show that all adverse effects on salmon, steelhead, sturgeon, and eulachon or the designated critical habitat for these species are avoided or mitigated. Projects within the Fairview Creek SFHA would be required to show they would not adversely affect water quality or quantity in Fairview Creek (a tributary to Columbia Slough), and those that do affect water quality or quantity would be appropriately mitigated.

Floodplain modification would still be allowed under the revised floodplain management ordinances; however, compliance with the performance standards of the Proposed Action would be required. For example, applicants requesting to modify the floodplain would be required to demonstrate that their projects' potential adverse effects on listed fish or designated critical habitat, both direct and indirect impacts, were mitigated. If the action were within the floodway or RBZ, only limited activities would be allowed. FEMA would provide assistance to the city through training and workshops on what constitutes an adequate assessment and the documentation required to comply with this requirement.

Because the city would be revising sensitive habitat ordinances and overlays (e.g., Floodplain, SEC, and Riparian and Wetland overlays), project proponents would know where sensitive habitats occurred and would be able to design projects to avoid these areas. Where impacts could not be avoided, applicants would have to incorporate appropriate mitigation into their designs.

Improved management of the floodplains within the City of Fairview is an expected outcome of the Proposed Action. Scientific verification that the existing 50-foot buffer requirement meets the new standards would be required. If these criteria are not met, then expansion of the RBZs would reduce non-source runoff, reduce sediment input, contain some upland-sourced contaminants, and generally improve water quality. Although runoff from the city into the Columbia River is miniscule in relation to typical flow in the river, this is especially important

on Fairview and Arata creeks. Both of these streams are tributaries to Columbia Slough. Water quality in the slough is poor at times (Section 3.5.1), and any improvement, even in areas not directly accessible to listed fish, should help water quality at points downstream that are accessible to fish. Young salmonids that may use the mouths of these creeks as temporary refugia would be the most likely to benefit from such changes.

Conclusion

In implementing the Proposed Action for this example community, the trend in the baseline of a continued decline of the quantity and quality of habitat would be reduced appreciably to the point of negligible impacts when viewed on a community-wide, program level scale. Additionally, activities with net beneficial effects or restoration objectives would be allowed within the protected area, potentially offsetting unavoidable adverse impacts occurring within the same spatial and temporal context. On a site-specific scale, the potential for unavoidable adverse effects (such as short-term construction related) would still occur. However, on a program level cumulative scale, any adverse effects would be negligible or discountable.

4.3.4 CITY OF EUGENE

NFIP Community-Specific Implementation

To meet the standards under the Proposed Action, the City of Eugene will be required to institute multiple changes to their implementation of the NFIP and related regulatory programs (Table 4.3-4). The most significant changes will be the implementation of the proposed minimum floodplain development regulations. Specifically, the city needs to incorporate additional standards for issuing floodplain development permits, limiting development in the floodway and RBZ, assessing functional habitat elements, and requiring appropriate mitigation.

Several city ordinances regarding floodplain development would be affected by the Proposed Action. These ordinances include the Floodplain Development, Waterside Protection, Water Quality, Wetland Buffer, and Water Resources Conservation overlay zones. Adoption of a model floodplain ordinance would ensure compliance with the standards under the Proposed Action, but would overlap with existing provisions in other ordinances, necessitating revisions to ensure regulatory consistency. The other approach of enforcing the standards through multiple existing ordinances would also require the adoption of revised ordinances. The most significant revisions are described below.

Other Proposed Action elements that may affect the city's NFIP implementation include tracking floodplain development permits. The city participates in the CRS and currently has a rating of 7. The city could choose to seek additional credits for habitat protection.

Table 4.3-4. NFIP Elements and Resulting Action by the City of Eugene

Section Reference*	Element	Eugene Action
Mapping		
2.5.1	Mapping	
	-1A: LOMCs	Community must ensure ESA compliance prior to issuance of floodplain development permit.
Floodplain Management Criteria		
2.5.2	Implementation of Regulations	
	-Requirement to obtain permits prior to issuing floodplain development permit	Community must ensure ESA compliance prior to issuance of floodplain development permit.
	-2A. Limitations of development/ adverse effects in RBZ and floodway	Current riparian buffers require permits for alterations within buffers, minimization and mitigation required; may need to revise language to match proposed standards.
	-2B. RBZ width of 50 – 170 ft	Current buffers vary in width and would require evaluation using BAS for any reduction of less than 170 ft.
	-2C. Mitigation for adverse effects on floodplain functions	Need to incorporate specific no net loss/beneficial gain mitigation standards.
Community Rating System		
2.5.3	CRS	City already participates in the CRS and could pursue additional credits for habitat protection.
Administration/Other		
2.5.4	Floodplain Mitigation Activities	Community must log floodplain development and assess impacts.
* Numbers refer to sections within Chapter 2 where the specific elements of the Proposed Action are described in detail.		

The city currently enforces a Floodplain Protection Ordinance as well as other regulations affecting development in floodplains (natural resource zone, waterside protection, wetland buffer protection, water quality, and water resources conservation overlay zones.

Floodplain Permits

The city's Floodplain Development Ordinance is the primary means for implementing the NFIP minimum floodplain development regulations. The ordinance requires a permit for development in the floodplains and contains a provision to ensure that other state and federal permits are obtained. The ordinance would need to be revised to reflect the performance measures of the Proposed Action prior to issuance of a floodplain development permit. The variance criteria in the Floodplain Protection Ordinance would also need to be modified to ensure the standards of the Proposed Action are addressed should a variance be issued. The ordinance does not contain compensatory storage provisions. The Proposed Action would require that any adverse impacts

on flood storage functions benefiting listed fish or critical habitat be mitigated, such as through compensatory storage.

Protected Area

The city currently enforces several overlapping ordinances regarding riparian area protection, with variable buffers depending on the overlay zone and the stream classification. The Willamette River is identified as a Category A stream, which requires a 100-foot buffer (per the city's Goal 5 inventory). Other floodplains in the city require 60-foot buffers per the Waterside Protection Overlay. The city has applied a Natural Resources zoning designation to portions of the Amazon Creek SFHA. The Natural Resources designation is intended to preserve areas for long-term protection of native vegetation, wetlands, waterways, wildlife habitat, rare plants, and surface and groundwater quality.

The city's buffers and other riparian protection standards may meet the standards of the Proposed Action, if supported by BAS, for the currently developed SFHAs. Buffers may need to be increased for some SFHAs where existing regulations or BAS is deemed insufficient in meeting the Proposed Action. The city's various ordinances place limits on development within riparian buffers and require permits for uses that are allowed. The city will need to review the scientific basis for their existing regulations and may need to revise this language to match the standards under the Proposed Action (i.e., only short-term impacts allowed when associated with functionally dependent uses or habitat restoration or enhancement).

The city places limits on the creation of new lots containing riparian buffers, but does not specifically prohibit the creation of new lots in floodplains. In implementing the Proposed Action, any subsequent development would require an assessment to identify and mitigate any adverse effects on listed species or critical habitat within the SFHA.

Habitat Assessment and Mitigation

The city requires minimization of and mitigation for habitat impacts through the various overlay zones. The city may need to incorporate more specific and stringent requirements for identifying and mitigating for any impacts resulting from development in the floodplain to implement the Proposed Action. The city must also ensure that the mitigation standards apply to the expansion of an existing structure footprint greater than 10 percent. These standards could be incorporated in the Floodplain Development Ordinance, other regulations with associated overlays or a separate ordinance.

Fish Impact Analysis

Listed fish within Eugene are the Upper Willamette River spring-run Chinook and Upper Willamette River steelhead. Designated critical habitat occurs along the Willamette River and its tributaries throughout Eugene for Chinook but not steelhead; there is no designated critical habitat in Amazon Creek (Section 3.5.1). Just over a third of the existing LOMR-Fs approved

within the city limits have been in the Willamette River watershed, and two-thirds on Amazon Creek (Figure 3.5-3). Those on the Willamette River had the potential to affect listed salmonids and their designated critical habitat when they were approved. The others along Amazon Creek, where there are no listed salmonids, may have affected streamflow and water quality (Figure 3.5-3). These past actions would be reflected in the baseline.

Currently, approximately 40 percent of the city's floodplain is developed. Existing city regulations would allow for additional development within the SFHA without specific requirements for impact assessment, habitat avoidance, or mitigation that specifically addresses the needs of federally listed fish. The following describes how the Proposed Action would change the existing regulations and the results that action would have on listed fish (Table 4.3-5).

Eugene is actively managing their waterways. They have a variety of ordinances to manage water quality, riparian areas, water resources, and wetlands. Each of these has a different set of buffers that apply depending on the stream type and location. There is a corresponding variety of allowable project types within the buffers depending on the buffer and location; all of these require minimization of impact and appropriate mitigation. A review of the scientific validity of the current buffer width requirements for surface waters will provide for better floodplain management. The 125 foot-wide buffers are among the largest for NFIP communities, so there could be a small, incremental improvement if a large buffer were shown to be more effective in protecting listed fish and habitat. At the least, verification of the science behind the current regulations would provide required clarity to the regulatory structure.

Projects in the Willamette River (and connected tributaries) SFHA would be required to show that all adverse effects on salmon, steelhead, sturgeon, and eulachon or the designated critical habitat for these species are avoided or mitigated. Projects within the Amazon Creek SFHA would be required to show that they would not adversely affect water quality or quantity downstream, and those that do affect water quality or quantity would be appropriately mitigated.

Floodplain modification would still be allowed under the revised floodplain management ordinances; however, compliance with the performance standards of the Proposed Action would be required. For example, applicants requesting to modify the floodplain would be required to demonstrate that their projects' potential adverse effects on listed fish or designated critical habitat, both direct and indirect impacts, were mitigated. If the action were within the floodway or RBZ, only limited activities would be allowed. FEMA would provide assistance to the city through training and workshops on what constitutes an adequate assessment and the documentation required to comply with this requirement.

Table 4.3-5. Summary of Existing Regulatory Conditions in the City Of Eugene, Changes that Could Occur Under the Proposed Action, and Effect Such Changes Could Have on Listed Fish and Designated Critical Habitat.

Proposed Action Element	Existing Conditions	Proposed Action	Resulting Fish Effects of Proposed Action
Section 2.5.2 Regulation Implementation	• Variety of streamside buffers ranging up to 125 ft depending on the overlay and area • Overlays for water quality, wetlands, water resources • Require minimization and mitigation	• Must document ESA compliance • RBZ may meet minimum, otherwise 170 ft • Update existing to match standards • Requires mitigation • Requires avoidance of habitats	• Long-term benefit • Potential site-specific adverse effects

Conclusion

The city appears to have all elements of the Proposed Action in place by the existing ordinances/overlays, but lacks in the breadth of coverage needed for full compliance. There would be some small incremental improvement in the processes for addressing floodplain functionality through implementation of the Proposed Action. In implementing the Proposed Action for this example community, the trend in the baseline of a continued decline of the quantity and quality of habitat would be reduced appreciably to the point of negligible impacts when viewed on a community-wide, program level scale. Additionally, activities with net beneficial effects or restoration objectives would be allowed within the protected area, potentially offsetting unavoidable adverse impacts occurring within the same spatial and temporal context. For example, Eugene has a sophisticated wetland bank program that has successfully improved wetlands and adjacent floodplain habitat along Amazon Creek. There will be an increasing beneficial intersection between the NFIP ESA protection measures and programs such as this. On a site-specific scale, the potential for unavoidable adverse effects (such as short-term construction related) would still occur. However, on a program level cumulative scale, any adverse effects would be negligible or discountable.

4.3.5 LANE COUNTY

NFIP Community-Specific Implementation

To meet the standards under the Proposed Action, Lane County will be required to institute multiple changes to their implementation of the NFIP and related regulatory programs (Table 4.3-6). The most significant changes will be the implementation of the proposed minimum floodplain development regulations. Specifically, the county needs to incorporate additional standards for the issuance of floodplain development permits, limit development in the floodway and RBZ, assess functional habitat elements, and require appropriate mitigation.

Table 4.3-6. NFIP Elements and Resulting Action by Lane County.

Section Reference*	Element	Lane County Action
Mapping		
2.5.1	Mapping	
	-1A: LOMCs	Community must ensure ESA compliance prior to issuance of floodplain development permit.
Floodplain Management Criteria		
2.5.2	Implementation of Regulations	
	-Requirement to obtain permits prior to issuing floodplain development permit.	Community must ensure ESA compliance prior to issuance of floodplain development permit.
	-2A. Limitations of development/ adverse effects in RBZ and floodway	Current riparian buffers require permits for alterations within buffers, minimization and mitigation required; may need to revise language to match proposed standards.
	-2B. RBZ width of 50 – 170 ft	May need wider buffers in undeveloped areas, smaller buffers in developed areas should be evaluated using BAS.
	-2C3. Mitigation for adverse effects on floodplain functions	Need to incorporate specific no net loss/beneficial gain mitigation standards.
Community Rating System		
2.5.3	CRS	Community could seek additional credits for habitat protection.
Administration/Other		
2.5.4	Floodplain Mitigation Activities	Community must log floodplain development and assess impacts.
* Numbers refer to sections within Chapter 2 where the specific elements of the Proposed Action are described in detail.		

Other Proposed Action elements that may affect the county's NFIP implementation include tracking floodplain development permits and assessing habitat impacts. The county participates in the CRS and currently has a rating of 7. The county could choose to pursue additional credits for habitat protection.

Several of the county's ordinances affect floodplain development and would be affected by the Proposed Action. The county enforces two floodplain ordinances, one affecting rural areas, the other affecting unincorporated areas within the UGBs of certain cities; both ordinances are essentially the same. The county also implements a Riparian Regulations Ordinance, and addresses floodplain impacts in its Land Division Ordinance. The County does not directly regulate wetlands, deferring to the DSL.

Floodplain Permits

The county's floodplain ordinances provide the primary means for implementing the NFIP minimum floodplain development regulations. The ordinances require permits for development in floodplains and contain a provision to ensure that other state and federal permits are obtained. Applicants are already required to consult with ODFW (see below). The floodplain ordinance language may need to be revised to specifically allow the withholding of a permit unless a proposed development demonstrates ESA compliance.

The floodplain ordinances allow for variances and make reference to the county's general approval criteria for variances of all types, found in LC 16.256 and 10.330. These criteria do not contain a provision regarding the avoidance of habitat impacts and would need to be updated or a separate provision created to address the standards of the Proposed Action. The ordinance does not contain compensatory storage provisions. The Proposed Action would require that any adverse impacts on flood storage functions benefiting listed fish or critical habitat be mitigated, such as through compensatory storage.

Protected Area

The standards under the Proposed Action would require that a protected area be established that includes the floodway and a riparian buffer zone (RBZ). The county enforces Riparian Regulations that require buffers ranging from 50 to 100 feet depending on the underlying zoning, whether the stream is located in the unincorporated portion of the Eugene-Springfield UGB, and the size of the stream. The Riparian Regulations set limits on vegetation removal within the required buffer based on a percentage of the total area within the buffer (75 percent retention required) as well as limits on the linear footage of vegetation removal allowed along a stream.

The county's Riparian Regulations also place limits on development within riparian buffers and require permits for uses that are allowed. The county will need to review the scientific basis for their existing regulations and may need to revise this language to match the standards under the Proposed Action (i.e., only short-term impacts allowed when associated with functionally dependent uses or habitat restoration or enhancement).

The Riparian Regulations contain specific exceptions to the buffer requirements for certain road maintenance and other road work activities conducted in areas regulated by the ESA for the protection of aquatic species, when such work is conducted pursuant to the current *Programmatic Biological Opinion and Magnuson - Stevens Act Essential Fish Habitat Consultation for Revisions to Standard Local Operating Procedures for Endangered Species to Administer Maintenance or Improvement of Road, Culvert, Bridge, and Utility Line Actions Authorized or Carried out by the US Army Corps of Engineers in Oregon* (SLOPES IV Roads, Culverts, Bridges and Utility Lines; NMFS 2008a), a site-specific biological opinion from NMFS, or other rules published in the Federal Register with concurrence from NFMS and

USFWS in accordance with the ESA. Some of this activity occurs in floodplains and would not be subject to the standards of the Proposed Action.

The county's floodplain ordinances and the Land Division Ordinance prohibit the creation of new lots that are entirely within the floodway. The Land Division Ordinance also contains a provision that the floodplain be kept in its natural state to the extent practicable. Proposed structures shall be located outside the floodplain in buildable lots that are partially within the floodplain. For lots entirely within the floodplain, proposed structures shall be located in the area with the least habitat impact.

Habitat Assessment and Mitigation

The Riparian Regulations require a preliminary investigation for proposals to alter vegetation within a required setback. The investigation is required to identify impacts on sensitive, rare, threatened, or endangered aquatic or terrestrial species. Restoration of altered vegetation is required if in excess of the allowable standards set forth in the ordinance. Proposals to alter vegetation within a buffer require the submittal of an alteration plan along with the investigation and a proposal for restoration or enhancement of vegetation. The applicant for such a proposal must also consult with the ODFW. The county would need to review these regulations to ensure that they meet the intent of the Habitat Assessment and mitigation provisions of the Proposed Action and to ensure that they apply to all development within the floodplain. The county must also ensure that the mitigation standards apply to the expansion of an existing structure footprint greater than 10 percent.

Fish Impact Analysis

Fish resources in Lane County streams are widespread. Populations of coho are found in most coastal rivers, and spring-run Chinook and steelhead on the Willamette River and its tributaries; federally protected species are found in many watersheds (Section 3.5.3). The populations potentially affected by the Proposed Action are Coastal coho, Upper Willamette River spring-run Chinook, and Upper Willamette River steelhead.

Currently, approximately 3.4 percent of the county's floodplain is developed. Existing county regulations would allow for additional development within the SFHA, but only after impact assessment, habitat avoidance, or mitigation that specifically addresses the needs of federally listed fish. The following describes how the Proposed Action would change the existing regulations and the results that action would have on listed fish (Table 4.3-7).

Similar to Eugene, Lane County is actively managing activities within and adjacent to their streams (Table 4.3-7). There are a variety of riparian setbacks ranging from the minimum of the Proposed Action (50 foot) to 100 feet depending on the size and location of the stream.

Table 4.3-7. Summary of Existing Regulatory Conditions in Lane County, Changes that Could Occur Under the Proposed Action, and Effect Such Changes Could Have on Listed Fish and Designated Critical Habitat.

Proposed Action Element	Existing Conditions	Proposed Action	Resulting Fish Effects of Proposed Action
Section 2.5.2 Regulation Implementation	• RBZs range from 50-100 ft depending on location and stream size • Rural and Urban floodplain ordinances prohibit development unless certified as no rise • Limited development allowed within riparian buffers • Riparian development requires assessment of impacts on ESA-listed species • Minimization and mitigation required within riparian buffers • Roadwork already complies with ESA (SLOPES)	• Must document ESA compliance • RBZ may meet minimum (BSA) within Urban areas, otherwise 170 ft • Requires no net loss or beneficial gain in Protected Area • Requires assessing effects and applying mitigation	• Long-term benefit • Potentially adverse effects at a site-specific project scale

Development in the floodplain is prohibited unless it is certified to not cause a rise in flood height. The only substantial changes required by the Proposed Action would be the increased documentation of ESA compliance, scientific review of the buffer zones for the unincorporated urban areas, and buffer zone expansion in rural areas. Depending on the outcome of a science review for unincorporated urban areas, some modification to the existing buffer system may occur. Additionally, for rural areas the buffers would increase in width. An increase in the RBZ for rural areas would provide added benefit to habitat, particularly for areas subject to development.

The county already requires the use of SLOPES IV-Transportation for roadway projects, and applicants presumably use the corresponding SLOPES IV-Restoration programmatic biological opinion for instream restoration projects (NMFS 2008b). Projects associated with this program would not be subject to the standards of the Proposed Action.

Projects in the Willamette River (and connected tributaries) SFHA would be required to show that all adverse effects on salmon, steelhead, or the designated critical habitat for these species are avoided or mitigated. Projects within the Siuslaw SFHA would require the same thing.

Floodplain modification would still be allowed under the revised floodplain management ordinances; however, compliance with the performance standards of the Proposed Action would

be required. For example, applicants requesting to modify the floodplain would be required to demonstrate that their project's potential adverse effects on listed fish or designated critical habitat, both direct and indirect impacts, were mitigated. If the action were within the floodway or RBZ, only limited activities would be allowed.

A significant contribution to the decline of habitat in all watersheds of Lane County is current agriculture and forestry practices. Those existing farm and forest practices are not subject to a floodplain development permit and would not be subject to the standards of the Proposed Action. However, should a change in the type of use for those rural lands occur, it may be subject to floodplain permit requirement and thus subject to the standards of the Proposed Action.

Conclusion

Similar to the City of Eugene, the county appears to have all elements of the Proposed Action in place by the existing ordinances/overlays, but lacks in the breadth of coverage needed for full compliance. There would be some small incremental improvement in the processes for addressing floodplain functionality through implementation of the Proposed Action. In implementing the Proposed Action for this example community, the trend in the baseline of a continued decline of the quantity and quality of habitat would be reduced somewhat to the point of negligible impacts when viewed on a community wide, program level scale. The amount of floodplain development impacts, compared to the impacts attributed to forest and farming practices not subject the standards of the Proposed Action, is relatively insignificant. Additionally, activities with net beneficial effects or restoration objectives would be allowed within the protected area, potentially offsetting unavoidable adverse impacts occurring within the same spatial and temporal context. On a site-specific scale, the potential for unavoidable adverse effects (such as short-term construction related) would still occur. However, on a program level cumulative scale, any adverse effects would be negligible or discountable.

4.3.6 COOS BAY

NFIP Community-Specific Implementation

To meet the standards under the Proposed Action, the City of Coos Bay will be required to institute multiple changes to their implementation of the NFIP and related regulatory programs (Table 4.3-8). The most significant changes will be the implementation of the proposed minimum floodplain development regulations. Specifically, the city needs to incorporate additional standards for issuing floodplain development permits, limiting development in the floodway and RBZ, assessing functional habitat elements, and requiring appropriate mitigation.

Other Proposed Action elements that may affect the city's NFIP implementation include tracking floodplain development permits. The city does not currently participate in the CRS. Should the city choose to do so, it may seek credits for habitat protection.

Table 4.3-8. NFIP Elements and Resulting Action by the City of Coos Bay.

Section Reference*	Element	Coos Bay Action
Mapping		
2.5.1	Mapping	
	-1A: LOMCs	Community must ensure ESA compliance prior to issuance of floodplain development permit.
Floodplain Management Criteria		
2.5.2	Implementation of Regulations	
	-Requirement to obtain permits prior to issuing floodplain development permit	Community must ensure ESA compliance prior to issuance of floodplain development permit.
	-2A. Limitations of development/ adverse effects in RBZ and floodway	Need to establish regulations limiting development and adverse habitat effects in the RBZ.
	-2B. RBZ width of 50 – 170 ft	Need to establish protected area regulations with buffer widths based on BAS.
	-2C. Mitigation for adverse effects on floodplain functions	Need to incorporate specific no net loss/beneficial gain mitigation standards.
Community Rating System		
2.5.3	CRS	Potential changes if community chooses to participate in CRS
Administration/Other		
2.5.4	Floodplain Mitigation Activities	Community must log floodplain development and assess impacts.
* Numbers refer to sections within Chapter 2 where the specific elements of the Proposed Action are described in detail.		

The city enforces a Flood Damage Protection Ordinance that meets the current minimum standards of the NFIP and Oregon law. The Coos Bay Estuary Management Plan (Coos County 1975) contains policies that may also affect development in floodplains. The plan is a regional plan prepared pursuant to Oregon Statewide Goal 16 (Estuarine Resources) that is referenced by the CBMC. Development proposed in areas affected by the plan is required to be consistent with plan policies. Implementation of the standards of the Proposed Action in other ordinances, adding regulations as described below to existing floodplain ordinance, or the creation of new ordinances (e.g., a riparian protection ordinance) would be required. The most significant provisions that would need to be addressed are described below.

Floodplain Permits

The city's Flood Damage Protection Ordinance provides primary means for implementing the NFIP minimum floodplain development regulations. The ordinance requires permits for development in floodplains and contains a provision to ensure that other state and federal permits

are obtained. This language may need to be revised to specifically allow the withholding of a permit unless a proposed development demonstrates ESA compliance.

The Flood Damage Protection Ordinance does not contain variance provisions, although the CBMC has variance provisions for development in general.

Coos Bay Land Development Ordinance

The Coos Bay Land Development Ordinance (CBMC 17.205) requires that proposed development within a designated Management Unit be evaluated against the policies of the plan. The plan places limits on the types of uses allowed within each Management Unit, with Natural being the most restrictive and Development allowing the greatest range of uses. The plan prioritizes uses such as water-dependent uses and requires mitigation for estuary impacts, such as filling or dredging. The ordinance may need to be revised to deconflict requirements with the standards of the Proposed Action.

Protected Area

The standards under the Proposed Action would require that a protected area be established that includes the floodway and a riparian buffer zone (RBZ). The city does not have buffer requirements that apply to all riparian or floodplain areas, although the city does require a 50-foot vegetated buffer from the Empire Lakes and the Upper and Lower Pony Creek Reservoirs (this is upstream of areas accessible to coho salmon). The city would need to establish protected area requirements in its floodplain ordinance or create a new stand-alone riparian protection ordinance. Buffer widths should be determined using BAS, considering the current level of development in the SFHAs. Although partially addressed in the CBMC, the city will need to comprehensively incorporate the standards under the Proposed Action regarding habitat impacts in the protected area (i.e., only short-term impacts allowed when associated with functionally dependent uses or habitat restoration or net beneficial gain).

Habitat Assessment and Mitigation

The city needs to incorporate specific and stringent requirements for the preparation of a Habitat Assessment and for mitigation for any impacts for development in the floodplain. The city must also ensure that the mitigation standards apply to the expansion of an existing structure footprint greater than 10 percent. Such provisions could reside in the floodplain ordinance, a newly created riparian protection ordinance, or another ordinance to be created.

Fish Impact Analysis

The primary fish species of concern in Coos Bay are Oregon Coast coho and their designated critical habitat (Section 3.5.4). The Coos River supports a large population of coho, and the bay itself is important habitat for migrating juvenile fish and upstream migrating adults. Fish use of streams within the city is somewhat limited (Section 3.5.4). Eulachon and green sturgeon, although potentially present, are not considered established.

Of the LOMR-Fs completed in the city, none appears to be in areas where it would have a direct effect on listed species or designated critical habitat (Figure 3.5-2). Several LOMR-Fs were issued in the developed areas of the Coalbank Slough and Blossom Gulch SFHAs and near Highway 101 on the east side of the peninsula in the Coos Bay SFHA, where existing habitat is non-existent. However, indirect effects can be attributed to fill in the floodplain through the cumulative deterioration of water quality, increased runoff, and reduction of organic input. Given the number of LOMR-Fs issued to the community since 1990 (9) and assuming the same level of anticipated fills in the future (mostly residential small parcels), the effect on species and habitat could appreciably impact an already degraded habitat.

Currently, approximately 45% of the city's floodplain is developed. Existing city regulations would allow for additional development within the SFHA without specific requirements for impact assessment, habitat avoidance, or mitigation that specifically addresses the needs of federally listed fish. The following describes how the Proposed Action would change the existing regulations and the results that action would have on listed fish (Table 4.3-9).

The existing regulations for floodplain management in Coos Bay are the minimum required to be in compliance with NFIP. There are no protective requirements for natural resources, no city-wide riparian buffers, restrictions on floodplain development, or impact assessment, avoidance, and mitigation requirements (Table 4.3-9) other than a review against the policies of the Coos Bay Estuary Plan.

Table 4.3-9. Summary of Existing Regulatory Conditions in the City of Coos Bay, Changes that Could Occur Under the Proposed Action, and Effect Such Changes Could Have on Listed Fish and Designated Critical Habitat.

Proposed Action Element	Existing Conditions	Proposed Action	Resulting Fish Effects of Proposed Action
Section 2.5.2 Regulation Implementation	• No comprehensive city-wide RBZs • Limited guidelines on allowable habitat impacts in management units of the Coos Bay Estuary Management Plan	• Must document ESA compliance • New riparian buffer would be created • Requires no net loss or beneficial gain mitigation • Requires impact assessment, avoidance, and mitigation	• Long-term benefit • Potential site-specific adverse effects

There are likely ongoing impacts on coho and their habitat, so implementation of the Proposed Action will result in immediate benefits for fish. The creation of city-wide riparian and streamside buffers will help preserve and improve these remaining ecosystem functions, which are extremely limited or degraded. BAS may be utilized to accurately reflect remaining functions, thus resulting in a reduced buffer size. The requirement to accurately assess proposed project impacts and require avoidance and mitigation will have beneficial effects on coho and designated critical habitat over existing conditions.

Conclusion

In implementing the Proposed Action for this example community, the trend in the baseline toward a continued decline of the quantity and quality of habitat would be reduced somewhat to the point of negligible impacts when viewed on a community-wide, program level scale. The current habitat in Coos Bay is already significantly degraded, limited, or non-existent. Activities with net beneficial effects or restoration objectives would be allowed within the protected area, potentially offsetting unavoidable adverse impacts occurring within the same spatial and temporal context. On a site-specific scale, the potential for unavoidable adverse effects (such as short-term construction related) would still occur. However, on a program level cumulative scale, any adverse effects would be negligible or discountable to the functional capacity of the Coos Bay estuary.

4.3.7 CITY OF MEDFORD

NFIP Community-Specific Implementation

To meet the standards under the Proposed Action, the City of Medford will be required to institute multiple changes to their implementation of the NFIP and related regulatory programs (Table 4.3-10). The most significant changes will be the implementation of the proposed minimum floodplain development regulations. Specifically, the city needs to incorporate additional standards for the issuance of floodplain development permits, limitation on development in the floodway and RBZ, assessing functional habitat elements, and requiring appropriate mitigation.

Other Proposed Action elements that may affect the city's NFIP implementation include tracking floodplain development permits. The city participates in the CRS and currently has a rating of 8. The city could choose to seek additional credits for habitat protection.

The city has several ordinances that affect floodplain development and would be affected by the Proposed Action. In particular, the city's Flood Damage Protection and Riparian Corridor ordinances would be affected. The city's Pre-Disaster Mitigation Plan sets overall goals and policy direction regarding floods and other natural hazards. The plan would not conflict with the Proposed Action. The most significant potential revisions are described below.

Floodplain Permits

The city's Flood Damage Protection Ordinance provides the primary means for implementing the NFIP minimum floodplain development regulations. The ordinance requires permits for development in floodplains and contains a provision to ensure that other state and federal permits are obtained. This language may need to be revised to specifically allow the withholding of a permit unless a proposed development demonstrates ESA compliance.

Table 4.3-10. NFIP Elements and Resulting Action by the City of Medford.

Section Reference*	Element	Medford Action
Mapping		
2.5.1	Mapping	
	-1A: LOMCs	Community must ensure ESA compliance prior to issuance of floodplain development permit.
Floodplain Management Criteria		
2.5.2	Implementation of Regulations	
	-Requirement to obtain permits prior to issuing floodplain development permit	Community must ensure ESA compliance prior to issuance of floodplain development permit.
	-2A. Limitations of development/ adverse effects in RBZ and floodway	Current riparian buffers require permits for reduction of buffers, minimization and mitigation required; may need to revise language to match proposed standards.
	-2B. RBZ width of 50 – 170 ft	Buffer width in developed areas should be evaluated using BAS.
	-2C. Mitigation for adverse effects on floodplain functions	Need to incorporate specific no net loss/beneficial gain mitigation standards.
Community Rating System		
2.5.3	CRS	Community could seek additional credits for habitat protection.
Administration/Other		
2.5.4	Floodplain Mitigation Activities	Community must log floodplain development and assess impacts.
* Numbers refer to sections within Chapter 2 where the specific elements of the Proposed Action are described in detail.		

The Flood Damage Protection Ordinance contains specific requirements for applicants to obtain a CLOMR and subsequently a LOMR for any proposal that would increase the BFE by more than 1 foot. The current provision would allow for FEMA to review the development for compliance with the ESA.

The Flood Damage Protection Ordinance allows for variances but does not contain a provision regarding the avoidance of habitat impacts. The variance criteria in the Floodplain Protection Ordinance would also need to be modified to ensure the standards of the Proposed Action are addressed should a variance be issued.

Protected Area

The standards under the Proposed Action would require that a protected area be established that includes the floodway and a riparian buffer zone (RBZ). The city is currently updating its Riparian Corridors Ordinance. The proposed ordinance would establish 50-foot riparian buffers. Riparian buffers could be reduced to a minimum of 25 feet with the approval of a permit for the

reduction. Any proposal to reduce a riparian buffer would require the submission of a restoration plan. Approval of a buffer reduction requires that impacts on habitat functions be minimized and mitigated for by restoration, enhancement, or other means. The city's buffers and other riparian protection standards may meet the minimum standard for the currently developed portions of SFHAs. However, the 25-foot variance that is allowed does not meet the minimum standard in the Proposed Action. The city will need to review the scientific basis for their existing regulations and may need to revise this language to match the standards under the Proposed Action (i.e., only short-term impacts allowed when associated with functionally dependent uses or habitat restoration or enhancement).

Habitat Assessment and Mitigation

The Riparian Corridors Ordinance requires the submission of a restoration plan for any proposal to reduce a riparian buffer. Approval of a proposal to reduce a buffer is conditioned on minimizing and mitigating for impacts on habitat functions. The city should review these regulations to ensure that they meet the intent of the Habitat Assessment and mitigation provisions of the Proposed Action and to ensure that they apply to all development within the floodplain. The city must also ensure that the mitigation standards apply to the expansion of an existing structure footprint greater than 10 percent.

Fish Impact Analysis

The SFHA in Medford is associated with Bear Creek and its tributaries. These streams support a small number of Sothern Oregon-Northern California coho and is designated critical habitat for coho (Section 3.5.5). As described above, the city implements a variety of regulations to manage floodplains, but there are substantial gaps between those regulations and the Proposed Action (Table 4.3-11).

While the City of Medford has some floodplain and riparian management ordinances in place, the Proposed Action will require substantial changes to them (Table 4.3-11). The Proposed Action will require assessment, avoidance, and mitigation for project-related impacts on coho and their critical habitat. This alone should help reduce the pressures on coho in Bear Creek. However, this population of fish is very small, with fewer than 20 fish often reported (Section 3.5.5). Any number of factors outside the influence of this program can eliminate this small population. A scientific review of the riparian buffer system within the city is likely to report that 50 feet may be adequate in some urban situations; however, the proposed variance for reducing that buffer to 25 feet (even with a restoration plan) is not allowed by the standards of the Proposed Action, and the city will need to update its ordinance to match the minimum of the Proposed Action.

Of the LOMR-Fs completed in the city, some appear to be in areas where they would have a direct effect on designated critical habitat (Figure 3.5-2). Most of the LOMR-Fs are associated

with commercial development, which tends to be larger plots of land. Given the number of LOMR-Fs issued to the community since 1990 (9) and assuming the same level of anticipated fills in the future (mostly commercial parcels), the effect on species and an already degraded habitat could be a adverse impact. However, future development will require adherence to the standards of the Proposed Action, resulting in the potential elimination of any loss of remaining habitat function associated with fill or of impacts associated with indirect effects (e.g., cumulative deterioration of water quality, increased runoff, and reduction of organic input).

Currently, approximately 45 percent of the city's floodplain is developed. Existing city regulations would allow for additional development within the SFHA without specific requirements for impact assessment, habitat avoidance, or mitigation that specifically addresses the needs of federally listed fish. The following describes how the Proposed Action would change the existing regulations and the results that action would have on listed fish (Table 4.3-11).

Table 4.3-11. Summary of Existing Regulatory Conditions in the City of Medford, Changes that Could Occur Under the Proposed Action, and Effect Such Changes Could Have on Listed Fish and Designated Critical Habitat.

Proposed Action Element	Existing Conditions	Proposed Action	Resulting Fish Effects of Proposed Action
Section 2.5.2 Regulation Implementation	• RBZ 50 ft from top of bank (can be reduced to 25 ft with restoration plan - proposed) • No fill within 50 ft of OHWL (or stream width, whichever is greater)	• Must document ESA compliance • RBZ may meet minimum, otherwise 170 ft • Requires no net loss or beneficial gain in Protected Area • Requires assessing effects and applying mitigation	• Long-term benefit • Potential site-specific adverse effects

Projects in the Bear Creek SFHA would be required to show that all adverse effects on salmon, or the designated critical habitat for this species are avoided or mitigated. Floodplain modification would still be allowed under the revised floodplain management ordinances; however, compliance with the performance standards of the Proposed Action would be required. For example, applicants requesting to modify the floodplain would be required to demonstrate that their projects' potential adverse effects on listed fish or designated critical habitat, both direct and indirect impacts, were mitigated. If the action were within the floodway or RBZ, only limited activities would be allowed. An expanded and enforced riparian buffer would benefit fish through increase streamside vegetation which in turn may reduce high water temperatures, a chronic problem in Bear Creek.

Conclusion

In implementing the Proposed Action for this example community, the trend in the baseline toward a continued decline of the quantity and quality of habitat would be reduced somewhat to the point of negligible impacts when viewed on a community-wide, program level scale. The current habitat in the Bear Creek SFHA is already significantly degraded, limited, or non-existent. Activities with net beneficial effects or restoration objectives would be allowed within the protected area, potentially offsetting unavoidable adverse impacts occurring within the same spatial and temporal context. On a site-specific scale, the potential for unavoidable adverse effects (such as short term construction related) would still occur. However, on a program level cumulative scale, any adverse effects would be negligible or discountable.

4.3.8 CITY OF LA GRANDE

NFIP Community-Specific Implementation

To meet the standards under the Proposed Action, the City of La Grande will be required to institute multiple changes to their implementation of the NFIP and related regulatory programs (Table 4.3-12). The most significant changes will be the implementation of the proposed minimum floodplain development regulations. Specifically, the city needs to incorporate additional standards for the issuance of floodplain development permits, limitation on development in the floodway and RBZ, assessing functional habitat elements, and requiring appropriate mitigation.

Other Proposed Action elements that may affect the city's NFIP implementation include tracking floodplain development permits. The city does not currently participate in the CRS. Should the city choose to do so, it may seek credits for habitat protection.

Several city ordinances address floodplain development and would be affected by the Proposed Action. In particular, the city's floodplain and Riparian Protection Area ordinances would be affected. The most significant potential revisions are described below.

Floodplain Permits

The city's floodplain ordinance is the primary means for implementing the NFIP minimum floodplain development regulations. The ordinance requires permits for development in floodplains and contains a provision to ensure that other state and federal permits are obtained. This language may need to be revised to specifically allow the withholding of a permit unless a proposed development demonstrates ESA compliance.

The floodplain ordinance allows for variances but does not contain a provision regarding the avoidance of habitat impacts and would need to be updated or a separate provision created to address the standards of the Proposed Action. The ordinance does not contain compensatory storage provisions. The Proposed Action would require that any adverse impacts on flood storage

functions benefiting listed fish or critical habitat be mitigated, such as through compensatory storage.

Table 4.3-12. NFIP Elements and Resulting Action by the City of La Grande.

Section Reference*	Element	La Grande Action
Mapping		
2.5.1	Mapping	
	-1A: LOMCs	Community must ensure ESA compliance prior to issuance of floodplain development permit.
Floodplain Management Criteria		
2.5.2	Implementation of Regulations	
	-Requirement to obtain permits prior to issuing floodplain development permit	Community must ensure ESA compliance prior to issuance of floodplain development permit.
	-2A. Limitations of development/ adverse effects in RBZ and floodway	Current riparian buffers require permits for certain uses within buffers, minimization and mitigation required; may need to revise language to match proposed standards.
	-2B. RBZ width of 50 – 170 ft	Buffer width should be evaluated using BAS.
	-2C. Mitigation for adverse effects on floodplain functions	Need to broaden mitigation provisions of Riparian Protection Area Ordinance to apply to entire floodplain.
Community Rating System		
2.5.3	CRS	Potential changes if community chooses to participate in CRS.
Administration/Other		
2.5.4	Floodplain Mitigation Activities	Community must log floodplain development and assess impacts.
* Numbers refer to sections within Chapter 2 where the specific elements of the Proposed Action are described in detail.		

Protected Area

The standards under the Proposed Action would require that a protected area be established that includes the floodway and a riparian buffer zone (RBZ). The city enforces a Riparian Protection Area Ordinance that only applies to the Grande Ronde River. The ordinance establishes a riparian corridor of 100 feet from the top of bank, except when there is a significant wetland within the 100-foot corridor, in which case the corridor is expanded to include the wetland. The ordinance limits uses and vegetation alteration within the riparian corridor, but does allow for roads and other limited uses; allowed uses require a permit. Permit conditions include requirements for mitigation to achieve no net loss of riparian resources and project review by ODFW. The ordinance contains a provision prohibiting land divisions that create lots that cannot be developed because of the city's riparian protection regulations.

The city will need to review the scientific basis for their existing regulations and may need to revise this language to match the standards under the Proposed Action (i.e., only short-term impacts allowed when associated with functionally dependent uses or habitat restoration or enhancement). This review should also determine whether they meet the minimum RBZ standards of the Proposed Action. Riparian buffers would likely be required along other streams within the city.

Habitat Assessment and Mitigation

The Riparian Protection Area ordinance requires permits for any alteration within the established riparian corridor of the Grande Ronde River. Such a permit must be reviewed by ODFW and provide mitigation for impacts on riparian resources, to achieve no net loss of those resources. The city should review these regulations to ensure that they meet the intent of the Habitat Assessment and mitigation provisions of the Proposed Action and to ensure that they apply to all development within the SFHA. The city must also ensure that the mitigation standards apply to the expansion of an existing structure footprint greater than 10 percent.

Fish Impact Analysis

The Grande Ronde River and several tributaries flow through the City of La Grande. The federally listed fish found in these streams are Snake River spring/summer-run Chinook and Snake River steelhead (Section 3.5.6). Critical habitat has been designated for both that includes streams within the city. The most important habitat for these species is the large cool pools in which they shelter for the summer. This habitat is found upstream of the City of La Grande, making the streams within the city primarily rearing and migration habitat (Nowak 2004).

Only two LOMR-Fs have been issued in the city since 1990. Given this low number, the effect on species is negligible. However, future development will require adherence to the standards of the Proposed Action, resulting in the potential elimination of any loss of remaining habitat function associated with fill or of impacts associated with indirect effects (e.g., cumulative deterioration of water quality, increased runoff, and reduction of organic input).

Currently, approximately 50 percent of the city's floodplain is developed. Existing city regulations would allow for additional development within the SFHA without specific requirements for impact assessment, habitat avoidance, or mitigation that specifically addresses the needs of federally listed fish for streams and tributaries to the Grande Ronde River. The following describes how the Proposed Action would change the existing regulations and the results that action would have on listed fish.

Although the city implements floodplain and riparian buffer ordinances, gaps in these regulations potentially contribute to impacts on listed species. The largest of these is the lack of riparian

buffer zones for the other streams in the city and no requirement for impact assessment of specific habitats along with appropriate avoidance or mitigation. The Proposed Action will require substantial changes to the floodplain and riparian management ordinances the City of La Grande has in place (Table 4.3-13). The change with the most apparent positive effect on fish will be the application of the protected area and associated requirement for assessment/mitigation to streams and tributaries to the Grande Ronde River.

Table 4.3-13. Summary of Existing Regulatory Conditions in the City of La Grande, Changes that Could Occur Under the Proposed Action, and Effect Such Changes Could Have on Listed Fish and Designated Critical Habitat.

Proposed Action Element	Existing Conditions	Proposed Action	Resulting Fish Effects of Proposed Action
Section 2.5.2 Regulation Implementation	• RBZ of 100 ft from Grande Ronde River only • ODFW consultation required for some permanent alterations of riparian areas • Wetlands buffered by 25 ft • No discussion of specific habitat avoidance measures • No compensatory storage element	• Must document ESA compliance • Riparian buffer would have to be scientifically reviewed • Requires no net loss or beneficial gain mitigation • Requires impact assessment, avoidance, and mitigation • Requires avoidance of habitats • Requires compensatory storage with avoidance and mitigation	• Long-term benefit • Potential site-specific adverse effects

Allowing projects to proceed in the stream channel, riparian buffer, or along unbuffered streams without assessment of impacts to species or their habitat leads to adverse affects on Chinook and steelhead. The Proposed Action would require avoidance of specific habitats, assessment of impacts, and development of appropriate mitigation measures to minimize those effects. This would provide a benefit to Chinook and steelhead and designated critical habitat.

Existing regulations in La Grande require applicants to consult with ODFW regarding alterations and mitigation plans proposed for work in the riparian buffer along the Grande Ronde River. The expansion of this requirement to include a scientific review of actions along other streams within the city, all actions within the riparian buffers, and specifically evaluating endangered species requirements should provide beneficial effects on listed fish and critical habitat.

The population of wild spring/summer-run Chinook that spawn upstream of La Grande is very small and variable. The steelhead population appears stable, but is also very small given the amount of accessible habitat (Section 3.5.6). Any actions that would reduce pressures on these populations and improve habitat quality would be considered beneficial. Improvement of

floodplain management within the city should result in an incremental improvement in water quality. Implementation of the standards of the Proposed Action should provide a benefit for the tributaries to the Grande Ronde River within the city (e.g., Mill Creek, Deal Creek, Gekeler Slough). This action would increase and maintain streamside vegetation, control input of contaminants from developed areas, reduce sediment inputs, and help decrease water temperatures as the quality of protected riparian vegetation improves.

Conclusion

In implementing the Proposed Action for this example community, the trend in the baseline toward a continued decline of the quantity and quality of habitat would be reduced somewhat to the point of negligible impacts when viewed on a community-wide, program level scale. The current habitat upstream of La Grande is in a relatively undeveloped state, while most of the floodplains within the City of La Grande are highly urbanized and provide no habitat value to fish. Chinook would not be expected to occur in these smaller creeks and sloughs, but steelhead could move through them on their way to and from spawning areas upstream of the city. Activities with net beneficial effects or restoration objectives would be allowed within the protected area, potentially offsetting unavoidable adverse impacts occurring within the same spatial and temporal context. On a site-specific scale, the potential for unavoidable adverse effects (such as short-term construction related) would still occur. However, on a program level cumulative scale, any adverse effects would be negligible or discountable.

4.3.9 UMATILLA COUNTY

NFIP Community-Specific Implementation

To meet the standards under the Proposed Action, Umatilla County will be required to institute multiple changes to their implementation of the NFIP and related regulatory programs (Table 4.3-14). The most significant changes will be the implementation of the proposed minimum floodplain development regulations. Specifically, the county needs to incorporate additional standards for the issuance of floodplain development permits, limit development in the floodway and RBZ, assess functional habitat elements, and require appropriate mitigation.

Other Proposed Action elements that may affect the county's NFIP implementation include tracking floodplain development permits and assessing habitat impacts. The county does not participate in the CRS. If the county chooses to participate in the CRS, it could pursue credits for habitat protection.

Several county ordinances that address floodplain development would be affected by the Proposed Action. In particular, the county's Flood Hazard Overlay Zone and Natural Area Overlay Zone ordinances would be affected. The most significant revisions are described below.

Table 4.3-14. NFIP Elements and Resulting Action by Umatilla County.

Section Reference*	Element	Umatilla County Action
Mapping		
2.5.1	Mapping	
	-1A: LOMCs	Community must ensure ESA compliance prior to issuance of floodplain development permit.
Floodplain Management Criteria		
2.5.2	Implementation of Regulations	
	-Requirement to obtain permits prior to issuing floodplain development permit	Community must ensure ESA compliance prior to issuance of floodplain development permit.
	-2A. Limitations of development/ adverse effects in RBZ and floodway	Need to establish regulations limiting development and adverse habitat effects in the RBZ to match Proposed Action.
	-2B. RBZ width of 50 – 170 ft	Buffer width should be evaluated using BAS.
	-2C. Mitigation for adverse effects on floodplain functions	Need to incorporate specific no net loss/beneficial gain mitigation standards.
Community Rating System		
2.5.3	CRS	Potential changes if community chooses to participate in CRS.
Administration/Other		
2.5.4	Floodplain Mitigation Activities	Community must log floodplain development and assess impacts.
* Numbers refer to sections within Chapter 2 where the specific elements of the Proposed Action are described in detail.		

Floodplain Permits

The County's Flood Hazard Overlay Zone Ordinance provides the primary means for implementing the NFIP minimum floodplain development regulations. The ordinance requires permits for development in floodplains and contains a provision to ensure that other state and federal permits are obtained. This provision specifically references the ESA, but may need to be broadened to specifically allow the withholding of a permit unless a proposed development demonstrates ESA compliance.

The ordinance contains a provision that applicants must obtain a CLOMR from FEMA for any proposed development in a floodway that would increase the BFE or, if no floodway has been established, any development in the floodplain that would increase the BFE by more than 1 foot. This provision gives FEMA the opportunity to deny the CLOMR unless ESA compliance can be demonstrated.

The floodplain ordinance allows for variances but does not contain a provision regarding the avoidance of habitat impacts and would need to be updated or a separate provision created to address the standards of the Proposed Action. The ordinance does not contain compensatory storage provisions. The Proposed Action would require that any adverse impacts on flood storage functions benefiting listed fish or critical habitat be mitigated, such as through compensatory storage.

Protected Area

The standards under the Proposed Action would require that a protected area be established that includes the floodway and a riparian buffer zone (RBZ). Umatilla County enforces a Natural Area Overlay Zone that applies to areas considered habitat for rare or endangered species, wetlands, and areas within 100 feet of the OHWL. The Natural Area Overlay Zone allows those uses that would be allowed by the underlying zoning, provided that filling, drainage, vegetation removal, or other alteration that would reduce the ecological value of a significant natural area does not occur. The Overlay Zone allows the county to review proposals for development to ensure the protection of ecological values. Proposals for dwellings or subdivisions within the Overlay Zone require coordination with ODFW.

This ordinance should be reviewed using BAS, to determine whether it meets the minimum RBZ standards of the Proposed Action. Buffers may need to be increased and more specific standards established regarding allowed and prohibited uses and limitations on adverse impacts on habitat.

Habitat Assessment and Mitigation

The county currently reviews proposals for development to ensure the protection of ecological values. The county would need to broaden that review for development within the SFHA to meet the standards of the Proposed Action. The county must also ensure that the mitigation standards apply to the expansion of an existing structure footprint greater than 10 percent. Such provisions could be included in the Flood Hazard Overlay Zone, Natural Area, or other ordinance.

Fish Impact Analysis

Umatilla County streams support populations of Middle Columbia River steelhead. This species is widely distributed through the basin and for which critical habitat has been designated throughout Umatilla County (Section 3.5.7). This population is small but relatively stable.

Currently, approximately 7.8 percent of the county's floodplain is developed. Existing county regulations would allow for additional development within the SFHA, but only after impact assessment, habitat avoidance, or mitigation that specifically addresses the needs of federally listed fish. The following describes how the Proposed Action would change the existing regulations and the results that action would have on listed fish (Table 4.3-15).

The largest gaps between the existing regulatory process in Umatilla County and the Proposed Action are in the breadth of application of existing ordinances (Table 4.3-15). The only substantial changes anticipated from the Proposed Action would be the documentation of ESA compliance where the current ordinances do not address scientific review of the buffer zones for the unincorporated urban areas, and buffer zone expansion in rural areas. Depending on the outcome of a science review for unincorporated urban areas, some modification to the existing buffer system may occur. Additionally, for rural areas, the buffers would increase in width. An increase in the RBZ for rural areas would provide added benefit to habitat, particularly for areas subject to development.

The Proposed Action would require the avoidance of specific habitats, assessment of impacts, and development of appropriate mitigation measures to minimize those effects. This allows more of the existing habitat to remain in place. Mitigation would be appropriate to the impact and presumably include rehabilitation of degraded Natural Areas to restore their ecological function. Poor water quality (primarily high temperature and low dissolved oxygen) is one of the main challenges facing steelhead in Umatilla County (Section 3.5.7). Properly evaluated projects and biologically appropriate mitigation required as part of the Proposed Action should minimize further degradation of water quality from floodplain management actions taken by the county. The type of possible rehabilitation projects are wide and beyond the scope of this evaluation, but presuming that they are appropriately designed and implemented, this would be a beneficial effect of the Proposed Action on steelhead and designated critical habitat.

Table 4.3-15. Summary of Existing Regulatory Conditions in Umatilla County, Changes that Could Occur Under the Proposed Action, and Effect Such Changes Could Have on Listed Fish and Designated Critical Habitat.

Proposed Action Element	Existing Conditions	Proposed Action	Resulting Fish Effects of Proposed Action
Section 2.5.2 Regulation Implementation	• Habitat for listed species is provided; 100 ft buffer from OHWL • Alteration of buffer allowed as long as use does not reduce ecological value • Some projects within buffer required to coordinate with ODFW • New lots within SFHA required to have buildable area outside SFHA	• Must document ESA compliance • RBZ may meet minimum (BAS) within Urban areas, otherwise 170 ft • Requires no net loss or beneficial gain in Protected Area • Requires assessing effects and applying mitigation	• Long-term benefit • Potential site-specific adverse effects

Conclusion

Similar to Lane County, the county appears to have all elements of the Proposed Action in place by the existing ordinances/overlays, but lacks the breadth of coverage needed for full

compliance. There would be some small incremental improvement in the processes for addressing floodplain functionality through implementation of the Proposed Action. In implementing the Proposed Action for this example community, the trend in the baseline of a continued decline of the quantity and quality of habitat would be reduced somewhat, to the point of negligible impacts when viewed on a community-wide, program level scale. The amount of floodplain development impacts, compared to the impacts attributed to agriculture practices not subject the standards of the Proposed Action, is relatively insignificant. Additionally, activities with net beneficial effects or restoration objectives would be allowed within the protected area, potentially offsetting unavoidable adverse impacts occurring within the same spatial and temporal context. On a site-specific scale, the potential for unavoidable adverse effects (such as short term construction related) would still occur. However, on a program level cumulative scale, any adverse effects would be negligible or discountable.

4.3.10 SUMMARY

The long-term effects of the Proposed Action as described above are considered programmatically beneficial. However, it is recognized that these are considered beneficial on the basis that the current baseline trend rate of a continued decline in the quantity and quality of habitat would be lessened to the point of negligible impacts when viewed on a community-wide, program level scale. Site-specific adverse effects will continue with the Proposed Action, but given the scale of the program analysis, FEMA considers the cumulative impact of these site-specific actions within all of Oregon's SFHA to be negligible and discountable.

The primary reason for this is:

- Prioritization of endangered species when assigning mapping priorities, which will result in maps that include endangered species requirements; these maps will in turn be a better tool for resource managers.
- Establishment of a Riparian Buffer Zone with limited activities of up to 170 feet, or based upon BAS, severely limiting potential adverse impacts on the more frequently flooded areas of the SFHA
- Requirements that call for impacts assessment and avoidance of impacts or the creation of appropriate mitigation throughout the SFHA.
- Potential reduction in floodplain development and preservation of more floodplain as projects are further encouraged to move to areas outside the SFHA.

4.4 IMPLEMENTATION SCHEDULE

New guidelines for the NFIP in Oregon, as explained under the Proposed Action, will take time to become fully functional. Based on the collaborative process among FEMA Region X, NMFS, and the NFIP communities in Washington, it is likely that the implementation process in Oregon will require 4 years. Implementation of these new measures will require education of the local

communities by FEMA, changes to local regulatory processes, involvement from state agencies, and potential regular coordination and review by NMFS. This portion of the analysis describes the effects that would occur under the NFIP in Oregon during the time between the current period and when the new guidelines are considered fully implemented – an estimated 4-year period.

Understanding the need for an interim program to better protect floodplains and listed fish habitat, FEMA will require communities during this implementation period to: (1) prohibit all NFIP-related actions in the SFHA during this time, or (2) require all potential adverse effects associated with a floodplain development proposal be mitigated utilizing authority under 44 CFR Part 60.3(a)(2) until such time as their existing ordinances can be updated.

It should be noted that local communities can allow land use changes in the SFHA, vegetation removal for instance, that have no nexus with the NFIP. So while FEMA can institute changes to their program elements that may currently be affecting floodplain habitat and listed fish, it has no control over many land use decisions under the regulatory authority of local communities and outside the purview of the NFIP.

Within this context, the internal changes to FEMA NFIP policies and the restrictions placed on local communities to prevent floodplain development or ensure that such actions have no effect on listed species will provide benefits to listed fish in comparison to the less stringent implementation procedures currently in place. These benefits will take place across all NFIP communities in Oregon. Floodplain habitat in communities with the more stringent floodplain regulations will see minor regulatory benefits, while those communities with lower floodplain protection strategies will see large improvements. A net gain in habitat function across the state is anticipated from implementation of the new procedures.

Implementation of the interim procedures will not eliminate or mitigate all adverse effects on floodplain habitat and listed species. Some projects may be allowed that provide sufficient mitigation to adequately compensate for effects on listed species but could still have low level, temporary effects on water quality for instance. In addition, some projects have already been reviewed and approved but not constructed under the current existing program. While the frequency of such an outcome, statewide, is anticipated to be low given the notifications provided by FEMA to the communities, it cannot be dismissed outright. Additionally, limited errors or misinterpretation of the requirements could lead to negligible adverse effects on floodplains and consequently listed fish species in Oregon. Across the state, these individual effects during the implementation phase may have site-specific adverse effects, but program wide would be considered negligible adverse effects.

4.5 INTERDEPENDENT AND INTERRELATED ACTIONS

An interrelated activity is an activity that is part of the Proposed Action and depends on the Proposed Action for its justification and is therefore "associated with" the Proposed Action. An interdependent activity is an activity that has no independent utility apart from the action under consultation or would only occur "because of" the Proposed Action (USFWS and NMFS 1998).

Floodplain management by counties and local jurisdictions begins with the implementation of the requirements of the NFIP for participating communities. Jurisdictions then build upon the NFIP requirements, based on their available resources and perceived needs. Development actions within the SFHA can only occur in compliance with local regulations and therefore the NFIP. While these actions are related to the NFIP, they are not wholly dependent on it.

Within some of the jurisdictions, local regulations overlay state floodplain regulations and include requirements for floodplain protection. Floodplain protections provided by State and local regulations provide some measure of benefit to listed fish throughout the state. Because of the complexity and interrelated aspects, it is not possible to precisely separate out these actions, and they are grouped with and discussed above previously (Section 4.3).

The Proposed Action is unlikely to cause any development in the floodplain outside the jurisdiction of the NFIP. In fact, the inverse is more likely, where more tightly regulated and responsible floodplain regulations under the NFIP have an interrelated beneficial effect by reducing unrelated land development actions in the floodplain.

4.6 CUMULATIVE EFFECTS

Under the ESA, cumulative effects should include effects from all non-federal actions that are reasonably certain to occur in the foreseeable future. This includes state, local, private, and tribal actions. Oregon's population, particularly in the Willamette Valley and Portland Metro area, is expected to continue growing. The Portland Metro (Metro) area could reach between 2.7 and 3.8 million residents by 2035 depending on the growth trend applied to the 2000 population of just over 1.9 million (Metro 2008). The additional development, supporting infrastructure, and related activities associated with this increase in population are likely to contribute to adverse cumulative effects on salmon and steelhead.

The potential list of non-federal actions that would be reasonably foreseeable throughout the state is innumerable. Direct cumulative impacts will occur from any development activity initiated or permitted by state or local jurisdictions, tribes, or private landowners outside the purview of the NFIP. These activities range from residential and business development; expanding and building new infrastructure such as buildings, roads, utilities; water-related projects such as flood control, water storage, or hydroelectric projects; continued irrigation

withdrawals; bank protection; and general land clearing. All these factors will inevitably affect surface waters and habitat for listed species of fish.

There are numerous state, local, and tribal efforts to reduce and minimize ongoing cumulative effects on listed fish. The Oregon Conservation Strategy (ODFW 2006), for example, provides a statewide planning context and a suite of tools for the preservation of sensitive species and the habitats upon which they rely. The Conservation Strategy is important because it provides a comprehensive process for implementation of conservation actions that do not focus on a particular species. The Oregon Plan for Salmon and Watersheds (State of Oregon 1997) started as an effort to conserve and enhance populations of coastal coho and has expanded to include native fish, wildlife, and water quality throughout the state (OWEB 2006). Local and regional governments (e.g., Metro) have their own riparian and floodplain preservation measures. The DEQ through mandates from the EPA continues to apply increasingly stringent stormwater regulations. Collectively, these should guide local jurisdictions and reduce effects on fish. However, the conclusion is that increased population densities will likely continue to exert cumulative impacts, even when state-of-the-art mitigation is applied.

4.7 EFFECTS DETERMINATION

Table 4.7-1 summarizes the ESA Effect Determination for all ESUs and DPSs under consideration for this PLBA. The vast majority of effects from the Proposed Action will be beneficial by ensuring compliance with ESA consultation, integrating ESA concerns into the mapping program, mandating science-based decision making for floodplain management, providing extensive education for NFIP communities, and providing long-term mentoring and monitoring to those communities. There will be some minor adverse residual effects associated with these new program elements. First, no program can be implemented flawlessly. There are bound to be cases where, through negligence or misunderstanding, a community does not fully implement its regulatory responsibilities. New program elements will, however, have monitoring and associated technical assistance of the communities. When discrepancies are detected, they will be corrected. Secondly, when minimization or compensatory mitigation is necessary, there may be short-term, negligible effects from construction of the original project and/or of the implementation of the mitigation measures. These short-term effects will be considered during the review of any mitigation conceptual design and minimized to the extent possible while considering the larger value and benefit of the compensatory mitigation.

Thus, the determination for the Proposed Action on a program-wide scale is **May Affect, Not Likely to Adversely Affect**. This is because the vast majority of the Proposed Action will result in beneficial effects on the current baseline trend rate. Effects associated with mitigated projects will be considered when developing a conceptual mitigation plan and minimized. Implementation of the Proposed Action, in and of itself, will not change the baseline trend rate to

a beneficial rate. Too many other factors (such as Hydro, Harvest, and Hatchery) have an influence on that rate that is beyond the scope or authority of the NFIP.

When examining a project-specific floodplain development permit and its potential to affect species, the determination would be **Likely to Adversely Affect**. The granting of floodplain development permits, however, is not a FEMA action; it is a third party action. Short-term temporary effects will continue with any proposed floodplain development project, particularly those that are functionally dependent. Additionally, habitat recovery projects requiring floodplain development permits may also contribute to short-term adverse effects, even though the overall effect on the species may be beneficial. Unfortunately, it is impracticable to accurately estimate the extent of adverse effects for each potential floodplain project, let alone determine the number that have a potential to adversely affect listed species or critical habitat.

Table 4.7-1. NFIP Elements, Actions and ESA Effect.

Section Reference*	Element	Action	ESA Effect
Mapping			
2.5.1	**Mapping**		
	-1A: LOMCs	LOMCs will be denied unless ESA compliance demonstrated.	Beneficial effects by significantly reducing effects of floodplain fill.
	-1B: Mapping Priorities	ESA species and habitat information to be incorporated into sequence of steps taken when issuing new floodplain maps.	Beneficial effects that contribute to better long-term management of floodplains and fish habitat.
	-1C: Modeling	Guidance to be provided for modeling used in hydraulic and hydrologic studies that considers future changes due to land use change or climate change.	Beneficial effects in considering fish effects from climate change and land use patterns. Will provide better data for local land use decisions.
Floodplain Management Criteria			
2.5.2	Implementation of Regulations		
	-Requirement to obtain permits prior to issuing floodplain development permit	Communities required to implement element.	Will provide beneficial effects by ensuring meeting ESA standards of science-based assessments and coordination.
	-2A. Limitations of development/adverse effects in RBZ	Communities required to implement element.	Will provide beneficial effects by allowing for restoration and net beneficial gain projects.
	-2B. RBZ width of 50 – 170 ft	Communities required to implement element.	Beneficial effects but increment will vary by community. Some communities have larger buffers and an increase to 170 ft will afford small benefits, while those communities with minimal buffers will experience greater functional floodplain benefits in the long term.

Section Reference*	Element	Action	ESA Effect
	-2C. Mitigation for adverse effects on floodplain functions outside RBZ	Communities required to implement element.	Requirement of providing compensatory mitigation for floodplain functions will provide long-term benefits to listed fish. There could be short-term negligible adverse effects from implementation of a mitigation plan during construction.
Community Rating System			
2.5.3	CRS	Volunteer program - additional credits available to participating communities for habitat protection.	Minor benefits – will vary by community as this is a voluntary program.
Administration/Other			
2.5.4	Floodplain Mitigation Activities	Require communities to log floodplain development, assess impacts, and provide mitigation where necessary. Provide guidance, technical assistance, and outreach to communities regarding habitat and effects analysis.	Will provide benefits to floodplain management by ensuring that specific measures listed above are implemented correctly.
2.5.5	Monitoring and Adaptive Management	Provide guidance, technical assistance, and outreach to communities. Prioritize CAVs, CACs, and enforcement actions based on presence of ESA species and other risk factors.	Monitoring and education will provide long-term programmatic benefits to comprehensive floodplain management, beneficial effects on listed fish and habitat, and compliance with ESA.
* Numbers refer to sections within Chapter 2 where the specific elements of the Proposed Action are discussed in detail.			

5.0 Essential Fish Habitat

5.1 INTRODUCTION

In 1996, Congress added new habitat conservation provisions to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (Public Law 104-267), the federal law that governs U.S. marine fisheries management. Congress asserted the following in the Findings section of the Magnuson-Stevens Act:

> The Magnuson-Stevens Act mandated the identification of Essential Fish Habitat (EFH) for managed species as well as measures to conserve and enhance the habitat necessary to fish to carry out their life cycles. The Magnuson-Stevens Act requires cooperation among NOAA Fisheries, Fisheries Management Councils, fishing participants, Federal and State agencies, and others in achieving EFH protection, conservation, and enhancement. Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)).

Federal agencies are required to consult with NMFS on any action authorized, funded, or undertaken that may adversely impact EFH. This consultation process is usually integrated into existing environmental review procedures in accordance with the National Environmental Policy Act (NEPA), consultation under Section 7 of the ESA, or Fish and Wildlife Coordination Act to provide the greatest level of efficiency; this section is intended to achieve this purpose. NMFS must provide the federal agency with EFH Consultation Recommendations for any action that would adversely affect EFH. These recommendations are advisory in nature. The reader is referred to Chapter 2 for a complete description of the Proposed Action.

5.2 ESSENTIAL FISH HABITAT IN OREGON

The Pacific Fishery Management Council (PFMC) has designated and manages EFH through three groups of species: groundfish, coastal pelagic species, and salmon. Fishery management plans have been developed for each group (PFMC 2008a for groundfish; PFMC 1998 for coastal pelagic species, and PFMC 2003 for salmon). Each species group is described briefly below. Species-specific descriptions are generally not appropriate for EFH analysis, which focuses on habitat commonly used by groups of species and are therefore not presented. The reader is referred to the specific management plans referenced above for species-specific information.

5.2.1 GROUNDFISH

Groundfish and pelagic EFH regulations provide management direction for over 80 species (e.g., sardines, rockfish, halibut, etc.) that live in coastal waters. Designated EFH for groundfish includes all tidal waters from the mean higher high water in coastal areas and the upstream extent of saltwater intrusion (salinities under 0.5 parts per thousand during low flow conditions) in rivers (PFMC 2008a). The seaward limit is the 3,500-m depth contour. The PFMC has conducted

extensive analysis relating species distribution, known life-cycle information, and marine habitat information to generate habitat areas of particular concern (HAPC). The five HAPCs are estuaries, canopy kelp, seagrass, rocky reefs, and areas of interest (PFMC 2008a). These are briefly described below.

- **Estuaries** are defined as protected nearshore areas that are influenced by both the ocean and freshwater (PFMC 2008a). Estuaries are productive habitat important to a variety of species for all aspects of their life history. Of the example communities described in Chapter 3, Coos Bay is within an estuary.

- **Canopy kelp** communities are found over mostly rocky substrates relatively near to shore. The kelp creates a complex habitat from the seafloor to the surface that provides habitat, forage, and cover for a wide array of species. The HACP for canopy kelp is defined as any areas associated with canopy-forming kelp species (PFMC 2008a).

- **Seagrass** includes eelgrass, wigeongrass, and surfgrass. All three species form dense beds in the lower intertidal and subtidal habitats. Eelgrass is typically found over soft substrates, whereas surfgrass is found on hard substrates in higher energy habitats. All of these habitats have high levels of productivity and provide foraging and spawning habitat for a variety of fish species.

- **Rocky reefs** are found in both nearshore and offshore habitats, all below mean higher high water where hard substrates are dominant. Any hard material from bedrock to gravel is considered a rocky reef (PFMC 2008a). This habitat is considered an HAPC because it is relatively limited in distribution but important to groundfish.

- Areas of interest in Oregon include two seamounts and the Daisy Bank/Nelson Island area (PFMC 2008a). Areas of interest are designated because they are unique geologic formations and serve a unique ecological function. Daisy Bank/Nelson Island, for example, was observed to support a density of juvenile rockfish 30 times higher than adjacent banks (PFMC 2008a).

The HAPCs for this evaluation are estuaries and seagrass areas. Rocky reefs and areas of interest are found well off shore and would not be affected by the Proposed Action. Based on review of the mapped seagrass areas in the fishery management plan, it appears that seagrass occurs primarily within estuaries along the Oregon Coast. Therefore, the description in this section simply evaluates potential effects on estuarine habitat in terms of groundfish EFH and makes the assumption that effects on estuaries could also include effects on seagrass.

5.2.2 COASTAL PELAGIC SPECIES

Coastal pelagic species include mackerel, sardines, anchovy, and squid. Because they are an important food source for a variety of species, the PFMC added EFH for krill to the pelagic species group and banned krill fishing off the Pacific Coast in 2008 (PFMC 2008b). EFH for the fish species extends from the shoreline offshore to the exclusive economic zone boundary 200 nautical miles offshore along the entire Oregon coastline. EFH for krill extends to the 1,829-m

depth contour (PFMC 2008b), but not to water that is that deep. EFH is limited to pelagic waters above the thermocline for fish and 100 m or 400 m deep depending on the krill species. Locations of coastal pelagic species populations are highly dependent on and shift seasonally in response to water temperatures. Although EFH starts at the shoreline and these species may occur in shallow-water nearshore habitat, they do not rely on these areas (PFMC 1998).

5.2.3 SALMON

Designated EFH for salmon in Oregon is limited to Chinook and coho because these are the two commercially harvested species. Designated EFH includes all lakes, streams, wetlands, and other water bodies currently or historically accessible to salmon (PFMC 2003). Areas above naturally occurring impassable barriers (e.g., waterfalls) identified by the PFMC are not considered EFH, but areas above artificial barriers (e.g., dams) are considered EFH (PFMC 2003). In estuarine and marine areas, EFH extends from the nearshore and tidal habitats out to the exclusive economic zone 200 nautical miles offshore.

Freshwater EFH for salmon includes those areas required by the fish to complete their life cycles (spawning habitat, juvenile rearing, and migration corridors). Within each of these habitat areas, water quality, substrate, water quantity, channel characteristics, food, cover, access, and floodplain connectivity are all important elements (PFMC 2003). All of these are found in Oregon streams, and many features occur on and immediately adjacent to the floodplains in NFIP-participating communities.

The main elements of marine EFH include estuarine rearing areas, ocean habitats, and juvenile and adult migration corridors. The features associated with these that are most important include water quality, forage, depth, cover, and suitable nearshore habitat. Marine EFH is only found along the coast of Oregon within communities whose boundaries include estuarine and marine environments.

5.3 EFFECTS ANALYSIS

Effects of the Proposed Action are described in detail in Chapter 4 for the components of FEMA's NFIP. This analysis applies to potential effects on EFH. It is difficult to assess the relative contribution of the NFIP to floodplain development because land use regulation occurs on the local scale, intermixed with state and federal floodplain and wetland regulations. Following the analysis in Chapter 4, it appears that the NFIP could have a mix of effects (short-term adverse and long-term beneficial) on floodplain development and thus, indirect effects on EFH freshwater systems. The NFIP appears to often discourage floodplain development or steer it out of the floodplain while in minor instances indirectly contributing to floodplain development. The NFIP does not apply to open ocean activities (e.g., commercial fishing, resource extraction, etc.); therefore, the Proposed Action will not affect EFH for groundfish,

coastal pelagic species, or salmon beyond nearshore and estuarine habitats influenced by local development actions (e.g., wharfs, piers, etc.).

Beneficial effects will result from the implementation of the Proposed Action and the more stringent regulations; increased monitoring, education, and enforcement by FEMA; a more comprehensive approach to floodplain management and fish habitat analysis under local regulatory processes; and a greater dependence on science-based decisions regarding regulatory processes, mitigation, and effects analysis.

5.4 ESSENTIAL FISH HABITAT DETERMINATION

Following the analysis of potential effects in Chapter 4, FEMA's NFIP in Oregon on a program scale would result in No Adverse Effect. However, if an individual floodplain development project proposal were evaluated, it would be a ***May Adversely Affect*** EFH for groundfish and coastal pelagic species in the nearshore areas primarily within estuaries. It would also be ***May Adversely Affect*** EFH for Chinook and coho in both freshwater and nearshore estuarine and marine environments for salmon. These effects are due primarily to functionally dependent uses allowed within the floodway and Riparian Buffer Zone. These effects are all indirect and may be adverse in the short term and long term, but appropriate mitigation would be required.

6.0 Preparers

Federal Emergency Management Agency

Mark Eberlein, Regional Environmental Officer, Region X

Barry Gall, Deputy Regional Environmental Officer, Region X

John Graves, Senior NFIP Specialist, Region X

Mark Riebau, NFIP Branch Chief, Region X

Oregon Department of Land Conservation and Development

Christine Shirley, State NFIP Coordinator

Amanda Punton, Natural Resource Specialist

AECOM

Jim Keany, Project Manager

Linda Howard, Environmental Planner

Geoff Appel, Environmental Planner

Demian Ebert, Fish Biologist

Dan Roscoe, Ecologist, GIS Specialist

Peter Carr, Editor

7.0 References

Alsea Geospatial, Inc, Hardin-Davis, Inc., Pacific Wildlife Research, Inc., and WaterWork Consulting. 2000. McKenzie River Subbasin Assessment, Summary Report. Prepared for the McKenzie Watershed Council. 64 pp.

Beamesderfer, R., L. Berg, M. Chilcote, J. Firman, E. Gilbert, K. Goodson, D. Jepsen, S. Knapp, B. McIntosh, J. Nicholas, J. Rodgers, T. Stahl, and B. Taylor. 2010. Upper Willamette River conservation and recovery plan for Chinook salmon and steelhead, ODFW/NMFS Public Review Draft.

BES (Bureau of Environmental Services). 2005. Chapter 7 of Final Columbia Slough Watershed Characterization Report. 38 pp. Available online at: http://www.portlandonline.com/bes/index.cfm?c=36081.

BureauNet. 2011. Community Status Information webpage. National Flood Insurance Program. Available at URL = http://bsa.nfipstat.com/comm_status/STATEOR.HTM. Accessed June 2011.

Butcher, D., P. Daniello, B. Kasper, B. Lamb, E. Nigg, D. Turner, M. Wiltsey, and M. Wolgamott. 2010. Lower Grande Ronde Subbasins TMDLs. Oregon Department of Environmental Quality. Water Quality Report 10-WQ-011. 196 pp.

Carter, J.A., G.A. McMichael, I.D. Welch, R.A. Harnish, and B.J. Bellgraph. 2009. Seasonal juvenile salmonid presence and migratory behavior in the Lower Columbia River. PNNL-18246, Pacific Northwest National Laboratory, Richland, WA. Prepared for US Army Corps of Engineers, Portland District under Contract No. DE-AC05-76RL01830.

CFWWC (Coast Fork Willamette Watershed Council). 2005. The Lower Coast Fork Willamette Watershed Sub-basin Assessment – Oregon.

Coos County. 1975. Coos Bay Estuary Plan, an Element of the Coos County Comprehensive Plan. Adopted May 16, 1975.

Dedrick, D., and C. Thieman. 2005. Long Tom Watershed Council, Conservation Strategy. 25 pp.

DEQ (Oregon Department of Environmental Quality). 1998. Columbia Slough Total Maximum Daily Load for Chlorophyll a, Dissolved Oxygen, pH, Phosphorus, bacteria, DDE/DDT, PCBs, Pb, Dieldrin, and 2,3,7,8 TCDD. 182 pp.

DEQ. 2000. Upper Grande Ronde River Sub-basin Total Maximum Daily Load. 76 pp.

DEQ. 2001. Umatilla River Basin Total Maximum Daily Load and Water Quality Management Plan. 429 pp + appendices.

DEQ. 2005. Walla Walla Subbasin Stream Temperature Total Maximum Daily Load and Water Quality Management Plan. 63 pp + appendices.

DEQ. 2006. Willamette Basin TMDL. Available online at http://www.deq.state.or.us/wq/tmdls/willamette.htm.

DEQ. 2007. Bear Creek Watershed TMDL. 129 pp+appendices.

DEQ. 2010a. Water Quality Assessment, Oregon's 2010 Integrated Report Database. Queried 5-17-2011 for Coos Bay. 41 pp.

DEQ. 2010b. Water Quality Assessment, Oregon's 2010 Integrated Report Database. Queried 5-18-2011 for Rogue River. 6 pp.

DEQ. 2010c. Water Quality Assessment, Oregon's 2010 Integrated Report Database. Queried 5-18-2011 for Upper Grande Ronde River. 37 pp.

DEQ. 2010d. Water Quality Assessment, Oregon's 2010 Integrated Report Database. Queried 5-19-2011 for Umatilla River. 35 pp.

DEQ. 2010e. Water Quality Assessment, Oregon's 2010 Integrated Report Database. Queried 5-19-2011 for Walla Walla River. 35 pp.

DEQ. 2010f. Water Quality Assessment, Oregon's 2010 Integrated Report Database. Queried 6-7-2011 for Columbia Slough. 54 pp.

DEQ. 2010g. Water Quality Assessment, Oregon's 2010 Integrated Report Database. Queried 6-9-2011 for Siuslaw River. 6 pp.

Ecotrust. 2002. A watershed assessment for the Siuslaw basin. Prepared for the Siuslaw Basin Council. 138 pp.

EDAW. 2006. National Flood Insurance Program (NFIP) Programmatic Biological Assessment for Listed Anadromous Salmonids in Washington State. Prepared for the Federal Emergency Management Agency (FEMA), Pacific Northwest Regional Office, Bothell, Washington. February 2006.

Eugene, City of and Lane County. 2004. West Eugene Wetlands Plan.

Fairview, City of. 2004. Fairview Comprehensive Plan.

FEMA. 2003. Guidelines and Specifications for Flood Hazard Mapping Partners. April, 2003.

FEMA. 2004. Internal review of NFIP Discretionary and Non-discretionary Actions.

FEMA. 2007. National Flood Insurance Program Community Rating System: Coordinator's Manual (OMB No. 1660-0022).

FEMA. 2009a. Letter from FEMA Headquarters to NMFS outlining FEMA's implementation plan to comply with the Biological Opinion. April 24, 2009

FEMA. 2009b. Letter from FEMA Headquarters to NMFS elaborating on FEMA's April 24, 2009 letter to NMFS outlining FEMA's implementation plan to comply with the Biological Opinion. June 17, 2009.

FEMA. 2010a. FEMA 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. January 2010. Available at URL = www.fema.gov/about/regions/regionx/nfipesa/shtm. FEMA, Region 10, Mitigation Division, Bothell, Washington.

FEMA. 2010b. Procedural Memorandum 64 – Compliance with the Endangered Species Act (ESA) for Letters of Map Changes. Prepared by Doug Bellomo, Director, Risk Analysis Division. Dated August 18, 2010.

FEMA. 2010c. National Flood Insurance Program Community Rating System: CRS Credit for Habitat Protection.

FEMA. 2010d. National Flood insurance Program: Flood Insurance Manual. Revised October 2010.

FEMA. 2010e. LOMC data (XLS format) from FEMA, Region X, Bothell, WA. Sent to AECOM, Seattle, WA via email.

FEMA. 2010f. Policy data (XLS format) from FEMA, Region X, Bothell, WA. Sent to AECOM, Seattle, WA via email.

FEMA. 2010g. FEMA's Risk Mapping, Assessment and Planning (MAP) Fiscal Year 2010 Report to Congress. April 13, 2010.

FEMA. 2010h. CRS Credit for Habitat Protection. National Flood Insurance Program Community Rating System. Available at URL = http://training.fema.gov/EMIWeb/CRS/index.htm. January 1, 2010.

Good, T.P., R.S. Waples, and P. Adams (editors). 2005. Updated status of federally listed ESUs of West Coast salmon and steelhead. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-66, 598 p.

Horton, R. 2001. Bear Creek Watershed Assessment, Phase II – Bear Creek Tributary Assessment. Prepared for Bear Creek Watershed Council and Rogue Valley Council of Governments.

Johnson, O.W., S. Grant, R.G. Kope, K. Neely, F. W. Waknitz, and R.S. Waples. 1997. Status review of chum salmon from Washington, Oregon, and California. NOAA Technical Memorandum NMFS-NWFSC-32.

Johnson, O.W., T.A. Flagg, D.J. Maynard, G.B. Milner, and F.W. Waknitz. 1991. Status Review for Lower Columbia River Coho Salmon. NOAA Technical Memorandum NMFS F/NWC-202.

Kostow, K. 1995. Biennial report of the status of wild fish in Oregon. Oregon Department of Fish and Wildlife. Portland, OR. *As cited in:* Johnson, O.W., S. Grant, R.G. Kope, K. Neely, F. W. Waknitz, and R.S. Waples. 1997. Status review of chum salmon from Washington, Oregon, and California. NOAA Technical Memorandum NMFS-NWFSC-32.

Laufle, J.C., G.B. Pauley, and M.F. Shepard. 1986. Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (Pacific Northwest) – Coho Salmon. Prepared for US Fish and Wildlife Service [Biological Report 82(11.48)] and US Army Corps of Engineers (TR EL-82-4). 18 pp.

LCFRB (Lower Columbia Fish Recovery Board). 2004. Lower Columbia salmon recovery and fish and wildlife subbasin plan: Appendix A - Focal Fish. 336 pp.

LCFRB (Lower Columbia Fish Recovery Board). 2010. WA Lower Columbia salmon recovery and fish and wildlife subbasin plan: Appendix A - Focal Fish. Available online at: http://www.lcfrb.gen.wa.us/Recovery%20Plans/March%202010%20review%20draft%20RP/RP%20Frontpage.htm. Accessed 2-28-2011.

LCOG (Lane Council of Governments). 2005. Delta Ponds: A vision for enhancement and management. Prepared for the Eugene Parks and Open Space, City of Eugene. 52 pp.

LPCWC (Lower Pony Creek Watershed Council). 2002. White Paper – Lower Pony Creek Watershed Assessment and Potential Action Plan. Draft of May 16, 2002. 13 pp.

LTWC (Long Tom Watershed Council). 2000. Long Tom Watershed Assessment. Prepared by the Long Tom Watershed Council. 185 pp.

Maudlin, M.R. 2000. Umatilla Sub-Basin Assessment. MS Thesis, University of Washington, Environmental and Regional Planning Program. 148 pp.

McElhany, P., M. Chilcote, J. Myers, and R. Beamesderfer. 2007. Viability Status of Oregon Salmon and Steelhead Populations in the Willamette and Lower Columbia Basins. Prepared for Oregon Department of Fish and Wildlife and National Marine Fisheries Service.

McMahon. T.E., and L.B. Holtby. 1992. Behavior, habitat use, and movements of coho salmon (*Oncorhynchus kisutch*) smolts during seaward migration. Canadian Journal of Fish and Aquatic Sciences. 49: 1478-1485.

Medford, City of. 2008. Pre-Disaster Mitigation Plan.

Medford, City of. 2010. City of Medford Flood Plain Viewer. Plot Date 10/14/2010.

Metro. 2008. 2005 – 2060 Regional Population and Employment Forecast for the seven-county Portland-Beaverton-Vancouver OR-WA Primary Metropolitan Statistical Area (PMSA). Public Review Draft May 19, 2008 11 pp.

Moyle, P.B. 2002. Inland Fishes of California, 2nd Edition. University of California Press.

Myers, J.M., R.G. Kope, B.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grant, F.W. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. Status review of Chinook salmon from Washington, Idaho, Oregon, and California. U.S. Dept. Commer., NOAA Tech. Memo NMFS-NWFSC-35.

Nickelson, T.E. 2001. Population Assessment: Oregon coast coho salmon ESU. Oregon Department of Fish and Wildlife. 51 pp.

NMFS (National Marine Fisheries Service).). 2000. 50 CFR Part 223 Endangered and Threatened Species; Salmon and Steelhead; Final Rules.

NMFS. 2001. Status review update for lower Columbia River coho salmon. West Coast Coho Salmon Biological Review Team, May 2001. *as cited in:* Good, T.P., R.S. Waples, and P. Adams (editors). 2005. Updated status of federally listed ESUs of West Coast salmon and steelhead. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-66, 598 p.

NMFS. 2005. Green Sturgeon (*Acipenser medirostris*) Status Review Update.

NMFS. 2008a. Programmatic Biological Opinion and Magnuson - Stevens Act Essential Fish Habitat Consultation for Revisions to Standard Local Operating Procedures for Endangered Species to Administer Maintenance or Improvement of Road, Culvert, Bridge, and Utility Line Actions Authorized or Carried out by the US Army Corps of Engineers in Oregon (SLOPES IV Roads, Culverts, Bridges and Utility Lines) File No: 2008/04070. 121 pp.

NMFS. 2008b. Programmatic Biological Opinion and Magnuson - Stevens Act Essential Fish Habitat Consultation for Revisions to Standard Local Operating Procedures for Endangered Species to Administer Stream Restoration and Fish Passage Improvement Actions Authorized or Carried out by the US Army Corps of Engineers in Oregon (SLOPES IV Restoration) File No: 2008/07790. 83 pp.

NMFS. 2008c. Endangered Species Act – Section 7 Consultation Final Biological Opinion and Magnuson-Stevens Fishery Conservation Management Act Essential Fish Habitat Consultation. NMFS, Northwest Region. September 22, 2008.

NMFS. 2009. Designation of Critical Habitat for the threatened Southern Distinct Population Segment of North American Green Sturgeon: Final Biological Report.

NMFS. 2010a. Critical Habitat for the southern distinct population segment of eulachon: Biological Report.

NMFS. 2010b. Status review update for eulachon in Washington, Oregon, and California. Prepared by the Eulachon Biological Review Team.

Nowak, C. 2004. Grande Ronde Subbasin Plan. Prepared for Northwest Power and Conservation Council. 491 pp.

Nowak, C. 2004. Grande Ronde Subbasin Plan. Prepared for Northwest Power and Conservation Council. 491 pp.

ODF (Oregon Department of Forestry). 2010. Northwest Oregon State Forests Management Plan. Revised Final Plan, April 2010. Available at URL =

http://www.oregon.gov/ODF/STATE_FORESTS/docs/management/nwfmp/NWFMP_Revised_April_2010.pdf?ga=t.

ODFW (Oregon Department of Fish and Wildlife). 2005. 2005 Oregon Native Fish Status Report: Volume II - Assessment Methods & Population Results. 573 pp.

ODFW. 2006. The Oregon Conservation Strategy.

ODFW. 2007. Oregon Coast Coho Conservation Plan for the State of Oregon. 63 pp.

ODFW. 2009. Oregon Coast Coho Conservation Plan Annual Report Card – 2008. 7 pp.

ODFW and NMFS. 2010. Upper Willamette River Conservation and Recovery Plan for Chinook Salmon and Steelhead. Public Review Draft. October 2010. Available at URL = http://www.dfw.state.or.us/fish/CRP/upper_willamette_river_plan.asp.

OWEB (Oregon Watershed Enhancement Board). 2006. Oregon Plan Biennial Report 2005 - 2007. Salem, Oregon.

PFMC (Pacific Fishery Management Council). 1998. The Coastal Pelagic Species Management Plan, Amendment 8.

PFMC. 2003. Pacific Coast Salmon Plan – Fishery Management Plan for Commercial and Recreational Salmon Fisheries off the coast of Washington, Oregon and California as revised through Amendment 14. 78 pp.

PFMC. 2008a. Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery as Amended through Amendment 19, including Amendment 15. 167 pp.

PFMC. 2008b. Management of Krill as an Essential Component of the California Current Ecosystem, Amendment 12 to the Coastal Pelagic Species Management Plan. 118 pp.

Picket, P.J., and R. Harding. 2002. Total Maximum Daily Load for Lower Columbia River Total Dissolved Gas. Prepared for Oregon Department of Environmental Quality and Washington Department of Ecology (publication no 02-03-004). 150 pp.

Runyon, J., T. Grubert, J. Allen, J. Reed, V. Rodgers, and K. Mattheson. 2002. Lower Middle Fork Willamette River Watershed Assessment. Prepared for The Middle Fork Willamette Watershed Council. 159 pp.

State of Oregon. 1997. Coastal Salmon Restoration Initiative: The Oregon Plan, Restoring an Oregon Legacy through Cooperative Efforts.

StreamNet. 2011. Willamette River, Eugene Steelhead distribution [online map]. http://query.streamnet.org/Request.cfm?cmd=BuildQuery&NewQuery=BuildCriteria&ID=1227618456580&Required=Run,Stream&DataCategory=23&_Count=1.

The Federal Interagency Stream Restoration Working Group. 1998. Stream Corridor Restoration Principles, Processes, and Practices.

Umatilla County. 1997. 1997 Umatilla County Flood Mitigation Plan, UO Community Planning Workshop, August, 1997.

Umatilla County. 2009. Natural Hazards Mitigation Plan.

United States District Court. 2009a. Case 3:09-cv-00729-HA: Complaint for Declaratory and Injunctive Relief. Filed June 25, 2009.

United States District Court. 2009b. Case 3:09-cv-00729-HA: Settlement Agreement and [Proposed] Court Order. Filed July 9, 2010.

USFS and BLM (USDA Forest Service and Bureau of Land Management). 1993. Record of decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (Northwest Forest Plan).

USFWS (U.S. Fish and Wildlife Service) and NMFS. 1998. Endangered Species Act Consultation Handbook: Procedures for Conducting Section 7 Consultations and Conferences. 315 pp.

U.S. Water Resources Council. 1978. 43 FR 6030. Floodplain Management Guidelines For Implementing E.O. 11988.

Weitkamp, L.A., T.C. Wainwright, G.J. Bryant, G.B. Milner, D.J. Teel, R.G. Kope, and R.S. Waples. 1995. Status review of coho salmon from Washington, Oregon, and California. NOAA Technical Memorandum NMFS-NWFSC-24. 258 pp.

WWC (Walla Walla County). 2004. Walla Walla Subbasin Plan. Prepared for Walla Walla Watershed Planning Unit and Walla Walla Basin Watershed Council. 252 pp.

Personal Communications

Alsbury, T., ODFW, District Biologist, North Willamette Watershed District, e-mail to D. Ebert, AECOM, Portland, OR, on June 7, 2011 regarding Arata Creek fish species.

Gray, M., ODFW, District Biologist, Umpqua Watershed District, e-mail to D. Ebert, AECOM, Portland, OR, on June 13, 2011 regarding Coos Bay fish species.

Ziller, J., ODFW, South Willamette Watershed District Biologist, e-mail to D. Ebert, AECOM, Portland, OR, on May 17, 2011 regarding spring-run Chinook in the Coast and Middle Fork Willamette rivers.

Appendices

Appendix A
List of NFIP Participating Communities in Oregon

Federal Emergency Management Agency
Community Status Book Report
OREGON
Communities Participating in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
410205#	ADAMS, CITY OF	UMATILLA COUNTY	08/30/74	05/15/84	09/03/10	05/15/84	No
410285#	ADRIAN, CITY OF	MALHEUR COUNTY	05/29/79	09/19/84	09/19/84	09/19/84	No
410137#	ALBANY, CITY OF	BENTON COUNTY/LINN COUNTY	02/22/74	04/03/85	09/29/10	04/03/85	No
410250#	AMITY, CITY OF	YAMHILL COUNTY	07/30/76	12/01/81	03/02/10	12/01/81	No
410071#	ARLINGTON, CITY OF	GILLIAM COUNTY	02/21/75	09/24/84	09/24/84(M)	09/24/84	No
410090#	ASHLAND, CITY OF	JACKSON COUNTY	06/07/74	06/01/81	06/01/81	06/01/81	No
410028#	ASTORIA, CITY OF	CLATSOP COUNTY	06/28/74	08/01/78	09/29/10	08/01/78	No
410206#	ATHENA, CITY OF	UMATILLA COUNTY	11/02/73	07/16/84	09/03/10	07/16/84	No
410155#	AUMSVILLE, CITY OF	MARION COUNTY	05/10/74	03/01/79	01/02/03	03/01/79	No
410156#	AURORA, CITY OF	MARION COUNTY	08/30/74	06/05/97	01/02/03	06/30/76	No
410002#	BAKER CITY, CITY OF	BAKER COUNTY	02/01/74	04/17/84	06/03/88	04/17/84	No
410001#	BAKER COUNTY*	BAKER COUNTY	02/28/78	02/28/78	06/03/88	06/03/88	No
410043#	BANDON, CITY OF	COOS COUNTY	12/21/73	08/15/84	09/25/09	08/15/84	No
410013#	BARLOW, CITY OF	CLACKAMAS COUNTY	01/10/75	05/05/81	06/17/08	05/05/81	No
410197#	BAY CITY, CITY OF	TILLAMOOK COUNTY	06/14/74	08/01/78	08/01/78	08/01/78	No
410240#	BEAVERTON,CITY OF	WASHINGTON COUNTY	02/01/74	09/28/84	02/18/05	09/28/84	No
410056#	BEND, CITY OF	DESCHUTES COUNTY	06/28/74	09/04/87	09/28/07	09/04/87	No
410008#	BENTON COUNTY *	BENTON COUNTY	12/27/74	08/05/86	08/05/86	08/05/86	No
410174#	BOARDMAN, CITY OF	MORROW COUNTY	09/12/75	12/18/07	12/18/07(M)	05/25/78	No
410110#	BONANZA, CITY OF	KLAMATH COUNTY	09/13/74	06/01/83	06/01/83(M)	06/01/83	No
410053#	BROOKINGS, CITY OF	CURRY COUNTY	05/31/74	09/18/85	09/25/09	09/18/85	No
410138#	BROWNSVILLE, CITY OF	LINN COUNTY	12/07/73	08/17/81	09/29/10	08/17/81	No
410281#	BURNS PAIUTE RESERVATION	HARNEY COUNTY	07/18/78	09/28/84	09/28/84	09/28/84	Yes
410084#	BURNS, CITY OF	HARNEY COUNTY	11/30/73	08/15/84	12/22/98	08/15/84	No
410091	BUTTE FALLS, TOWN OF	JACKSON COUNTY	11/08/74	06/30/76	06/30/76(M)	06/30/76	No
410014#	CANBY, CITY OF	CLACKAMAS COUNTY	11/16/73	06/15/84	06/17/08	06/15/84	No
410029#	CANNON BEACH, CITY OF	CLATSOP COUNTY	06/21/74	09/01/78	09/29/10	09/01/78	No
410075#	CANYON CITY, CITY OF	GRANT COUNTY	12/07/73	09/18/87	09/18/87	09/18/87	No
410060#	CANYONVILLE, CITY OF	DOUGLAS COUNTY	06/07/74	11/01/78	02/17/10	11/01/78	No
410251#	CARLTON, CITY OF	YAMHILL COUNTY	11/30/73	03/02/10	03/02/10	06/30/76	No
410087#	CASCADE LOCKS, CITY OF	HOOD RIVER COUNTY	05/24/74	09/24/84	09/24/84(M)	09/24/84	No
410107#	CAVE JUNCTION, CITY OF	JOSEPHINE COUNTY	11/08/74	06/01/82	12/03/09	06/10/80	No
410092#	CENTRAL POINT, CITY OF	JACKSON COUNTY	06/21/74	09/30/80	01/19/82	09/30/80	No
410111#	CHILOQUIN, CITY OF	KLAMATH COUNTY	11/30/73	08/15/84	08/15/84	08/15/84	No
415588#	CLACKAMAS COUNTY*	CLACKAMAS COUNTY		03/01/78	06/17/08	03/01/78	No
410035#	CLATSKANIE, CITY OF	COLUMBIA COUNTY	12/07/73	09/29/86	11/26/10	09/29/86	No
410027#	CLATSOP COUNTY*	CLATSOP COUNTY	12/20/74	07/03/78	09/29/10	07/03/78	No
410119#	COBURG, CITY OF	LANE COUNTY	12/21/73	01/06/84	06/02/99(M)	01/06/84	No
410034#	COLUMBIA COUNTY*	COLUMBIA COUNTY	01/17/75	08/16/88	11/26/10	08/16/88	No
410036#	COLUMBIA, CITY OF	COLUMBIA COUNTY	12/21/73	06/05/85	11/26/10	06/05/85	No
410072#	CONDON, CITY OF	GILLIAM COUNTY	05/24/74	09/24/84	09/24/84(M)	09/24/84	No
410044#	COOS BAY, CITY OF INCLUDES THE CITY OF EASTSIDE	COOS COUNTY	08/23/74	08/01/84	09/25/09	08/01/84	No
410042#	COOS COUNTY *	COOS COUNTY	11/01/74	11/15/84	09/25/09	11/15/84	No
410045#	COQUILLE, CITY OF	COOS COUNTY	11/03/73	09/28/84	09/25/09	09/28/84	No
410261#	CORNELIUS, CITY OF	WASHINGTON COUNTY	11/05/76	01/06/82	01/06/82	01/06/82	No
410009#	CORVALLIS, CITY OF	BENTON COUNTY	06/14/74	01/03/85	01/03/85	01/03/85	No
410120#	COTTAGE GROVE, CITY OF	LANE COUNTY	02/22/74	11/15/85	06/02/99	11/15/85	No
410121#	CRESWELL, CITY OF	LANE COUNTY	12/21/73	09/18/85	06/02/99	09/18/85	No
410050#	CROOK COUNTY *	CROOK COUNTY	08/16/77	07/17/89	07/17/89	07/17/89	No
410290#	CULVER, CITY OF	JEFFERSON COUNTY		09/04/87	09/04/87	02/18/88	No

Federal Emergency Management Agency
Community Status Book Report
OREGON
Communities Participating in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
410052#	CURRY COUNTY *	CURRY COUNTY	09/13/74	04/03/78	09/25/09	04/03/78	No
410187#	DALLAS, CITY OF	POLK COUNTY	11/23/73	04/05/88	12/19/06	04/05/88	No
410006#	DAMASCUS, CITY OF	CLACKAMAS COUNTY		07/19/00	06/17/08	05/10/07	No
410252#	DAYTON, CITY OF	YAMHILL COUNTY	01/23/74	06/01/82	03/02/10	06/01/82	No
410076#	DAYVILLE, CITY OF	GRANT COUNTY	01/24/75	09/24/84	09/24/84(M)	09/24/84	No
410283#	DEPOE BAY, CITY OF	LINCOLN COUNTY	06/12/79	10/15/80	12/18/09	10/15/80	No
410055#	DESCHUTES COUNTY *	DESCHUTES COUNTY	01/17/75	08/16/88	09/28/07	08/16/88	No
410157#	DETROIT, CITY OF	MARION COUNTY	11/01/74	06/30/76	01/02/03	06/30/76	No
410059#	DOUGLAS COUNTY *	DOUGLAS COUNTY		12/15/78	02/17/10	12/15/78	No
410061#	DRAIN, CITY OF	DOUGLAS COUNTY	04/05/74	08/01/79	02/17/10	08/01/79	No
410231#	DUFUR, CITY OF	WASCO COUNTY	06/07/74	09/24/84	09/24/84(M)	09/24/84	No
410253#	DUNDEE, CITY OF	YAMHILL COUNTY	06/28/74	03/02/10	03/02/10	03/01/82	No
410262#	DUNES CITY, CITY OF	LANE COUNTY	01/28/77	03/24/81	06/02/99(M)	03/24/81	No
410263#	DURHAM, CITY OF	WASHINGTON COUNTY	11/12/76	01/06/82	02/18/05	01/06/82	No
410093#	EAGLE POINT, CITY OF	JACKSON COUNTY	10/18/74	09/30/80	09/30/80	09/30/80	No
410207#	ECHO, CITY OF	UMATILLA COUNTY	09/13/74	05/15/84	09/03/10	05/15/84	No
410218#	ELGIN, CITY OF	UNION COUNTY	12/19/75	11/15/78	11/15/78	11/15/78	No
410062#	ELKTON, CITY OF	DOUGLAS COUNTY	09/13/74	09/05/79	02/17/10	09/05/79	No
410225#	ENTERPRISE, CITY OF	WALLOWA COUNTY	12/28/73	01/23/76	02/17/88	02/17/88	No
410016#	ESTACADA, CITY OF	CLACKAMAS COUNTY	11/09/73	06/17/08	(NSFHA)	06/30/76	No
410122#	EUGENE, CITY OF	LANE COUNTY	06/07/74	09/29/86	06/02/99	09/29/86	No
410180#	FAIRVIEW, CITY OF	MULTNOMAH COUNTY	05/10/74	03/18/86	12/18/09	09/30/87	No
410188#	FALLS CITY, CITY OF	POLK COUNTY	05/10/74	07/07/81	12/19/06	07/07/81	No
410123#	FLORENCE, CITY OF	LANE COUNTY	05/31/74	05/17/82	06/02/99	05/17/82	No
410241#	FOREST GROVE, CITY OF	WASHINGTON COUNTY	03/01/74	03/15/82	03/15/82	03/15/82	No
410246#	FOSSIL, CITY OF	WHEELER COUNTY	06/28/74	05/04/89	05/04/89	05/04/89	No
410280#	GARIBALDI, CITY OF	TILLAMOOK COUNTY		04/17/78	04/17/78	04/17/78	No
410242#	GASTON, TOWN OF	WASHINGTON COUNTY		07/05/82	07/05/82	07/05/82	No
410159#	GATES, CITY OF	MARION COUNTY	07/02/76	12/04/79	01/02/03	12/04/79	No
410030#	GEARHART, CITY OF	CLATSOP COUNTY	12/07/73	05/15/78	09/29/10	05/15/78	No
410160#	GERVAIS, CITY OF	MARION COUNTY	06/28/74	06/30/76	(NSFHA)	06/30/76	No
410070#	GILLIAM COUNTY *	GILLIAM COUNTY	06/07/77	09/24/84	09/24/84(M)	09/24/84	No
410017#	GLADSTONE, CITY OF	CLACKAMAS COUNTY	04/05/74	03/15/77	06/17/08	03/15/77	No
410063#	GLENDALE, CITY OF	DOUGLAS COUNTY	12/28/73	09/29/78	02/17/10	09/29/78	No
410054#	GOLD BEACH, CITY OF	CURRY COUNTY	11/23/73	11/15/85	09/25/09	11/15/85	No
410094#	GOLD HILL, CITY OF	JACKSON COUNTY	01/09/74	09/17/80	09/17/80	09/17/80	No
410074#	GRANT COUNTY *	GRANT COUNTY	10/18/74	02/15/79	05/18/82	02/15/79	No
410108#	GRANTS PASS, CITY OF	JOSEPHINE COUNTY	03/22/74	04/15/81	12/03/09	04/15/81	No
410192#	GRASS VALLEY, CITY OF	SHERMAN COUNTY	11/22/74	09/24/84	09/24/84(M)	09/24/84	No
410181#	GRESHAM, CITY OF	MULTNOMAH COUNTY	12/07/73	07/16/79	12/18/09	07/16/79	No
410003#	HAINES, CITY OF	BAKER COUNTY	12/06/74	06/03/88	(NSFHA)	04/30/84	No
410004#	HALFWAY, TOWN OF	BAKER COUNTY	09/26/75	09/24/84	06/03/88	09/24/84	No
410139#	HALSEY, CITY OF	LINN COUNTY		09/29/10	(NSFHA)	07/21/78	No
410026#	HAPPY VALLEY, CITY OF	CLACKAMAS COUNTY	12/20/74	12/04/79	06/17/08	12/04/79	No
410083#	HARNEY COUNTY *	HARNEY COUNTY	04/18/78	04/17/84	04/17/84	04/17/84	No
410140#	HARRISBURG, CITY OF	LINN COUNTY	03/01/74	02/03/82	09/29/10	02/03/82	No
410208#	HELIX, CITY OF	UMATILLA COUNTY	12/20/74	06/01/84	09/03/10	06/01/84	No
410175#	HEPPNER, CITY OF	MORROW COUNTY	11/23/73	04/01/81	12/18/07	04/01/81	No
410209#	HERMISTON, CITY OF	UMATILLA COUNTY	04/05/74	10/28/77	09/03/10	10/28/77	No
410243#	HILLSBORO, CITY OF	WASHINGTON COUNTY	04/12/74	05/17/82	05/17/82	05/17/82	No
410085#	HINES, CITY OF	HARNEY COUNTY	11/30/73	09/28/84	11/03/89	09/28/84	No
410086#	HOOD RIVER COUNTY *	HOOD RIVER COUNTY	12/06/77	09/24/84	09/24/84(M)	09/24/84	No

Federal Emergency Management Agency
Community Status Book Report
OREGON
Communities Participating in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
410088#	HOOD RIVER, CITY OF	HOOD RIVER COUNTY	05/24/74	09/24/84	09/24/84(M)	09/24/84	No
410161#	HUBBARD, CITY OF	MARION COUNTY	05/10/74	02/05/86	01/02/03	02/05/86	No
410005#	HUNTINGTON,CITY OF	BAKER COUNTY	11/30/73	09/24/84	06/03/88	09/24/84	No
410162#	IDANHA, CITY OF	LINN COUNTY	08/30/74	03/01/79	01/02/03	03/01/79	No
410189#	INDEPENDENCE, CITY OF	POLK COUNTY	05/21/76	04/05/88	12/19/06	04/05/88	No
410176#	IONE, CITY OF	MORROW COUNTY	11/22/74	04/01/81	12/18/07	04/01/81	No
410177#	IRRIGON, CITY OF	MORROW COUNTY	10/03/75	12/18/07	12/18/07	08/26/77	No
410220#	ISLAND CITY, CITY OF	UNION COUNTY	08/30/74	09/29/78	09/30/87	09/29/78	No
415589#	JACKSON COUNTY *	JACKSON COUNTY	04/11/78	04/01/82	05/15/02	04/01/82	No
410095#	JACKSONVILLE, CITY OF	JACKSON COUNTY	06/21/74	12/04/79	12/04/79	12/04/79	No
410101#	JEFFERSON COUNTY *	JEFFERSON COUNTY	07/26/77	07/17/89	07/17/89	07/17/89	No
410163#	JEFFERSON, CITY OF	MARION COUNTY	01/25/74	03/01/79	01/02/03	03/01/79	No
410077#	JOHN DAY, CITY OF	GRANT COUNTY	03/22/74	09/15/77	02/23/82	09/15/77	No
410150#	JORDAN VALLEY, CITY OF	MALHEUR COUNTY	02/07/75	09/19/84	09/19/84	09/19/84	No
410226#	JOSEPH, CITY OF	WALLOWA COUNTY	05/24/74	12/05/75	02/17/88	02/17/88	No
415590#	JOSEPHINE COUNTY *	JOSEPHINE COUNTY	08/16/77	06/01/82	12/03/09	06/01/82	No
410124#	JUNCTION CITY, CITY OF	LANE COUNTY	05/10/74	06/15/82	06/02/99	06/15/82	No
410288#	KEIZER, CITY OF	MARION COUNTY	08/15/79	05/01/85	01/02/03	08/15/79	No
410269#	KING CITY, CITY OF	WASHINGTON COUNTY	02/11/76	02/18/05	02/18/05	02/11/76	No
410109#	KLAMATH COUNTY *	KLAMATH COUNTY	12/27/74	12/18/84	12/18/84	12/18/84	No
410112#	KLAMATH FALLS, CITY OF	KLAMATH COUNTY	06/28/74	06/05/85	06/05/85	06/05/85	No
410260#	LA GRANDE, CITY OF	UNION COUNTY	11/30/73	09/30/80	04/03/96	09/30/80	No
410057#	LA PINE, CITY OF	DESCHUTES COUNTY		09/28/07	09/28/07	12/06/07	No
410254#	LAFAYETTE, CITY OF	YAMHILL COUNTY	11/30/73	06/15/82	03/02/10	06/15/82	No
410115#	LAKE COUNTY *	LAKE COUNTY	01/31/78	12/05/89	12/05/89	12/05/89	No
410018#	LAKE OSWEGO, CITY OF	MULTNOMAH COUNTY/CLACKAMAS COUNTY/WASHINGTON COUNTY	06/14/74	08/04/87	06/17/08	08/04/87	No
410278#	LAKESIDE, CITY OF	COOS COUNTY	11/22/77	08/01/84	09/25/09	08/01/84	No
410116#	LAKEVIEW, CITY OF	LAKE COUNTY	05/24/74	11/16/82	09/05/90	11/16/82	No
415591#	LANE COUNTY*	LANE COUNTY	08/16/77	12/18/85	06/02/99	12/18/85	No
410141#	LEBANON, CITY OF	LINN COUNTY	11/30/73	07/02/81	09/29/10	07/02/81	No
410178#	LEXINGTON, CITY OF	MORROW COUNTY	09/06/74	04/01/81	12/18/07	04/01/81	No
410130#	LINCOLN CITY, CITY OF	LINCOLN COUNTY	11/08/74	04/17/78	12/18/09	04/17/78	No
410129#	LINCOLN COUNTY *	LINCOLN COUNTY	01/17/75	09/03/80	12/18/09	09/03/80	No
410136#	LINN COUNTY*	LINN COUNTY	12/06/77	09/29/86	09/29/10	09/29/86	No
410078#	LONG CREEK, CITY OF	GRANT COUNTY	12/27/74	09/24/84	09/24/84(M)	09/24/84	No
410227#	LOSTINE, CITY OF	WALLOWA COUNTY	11/08/74	11/08/74	02/17/88	02/17/88	No
410125#	LOWELL, CITY OF	LANE COUNTY	03/29/74	06/02/99	06/02/99(M)	03/30/81	No
410142#	LYONS, CITY OF	LINN COUNTY	03/08/74	12/15/81	09/29/10	12/15/81	No
410103#	MADRAS, CITY OF	JEFFERSON COUNTY	06/28/74	07/17/89	07/17/89	07/17/89	No
410149#	MALHEUR COUNTY*	MALHEUR COUNTY	04/04/78	09/29/86	09/29/86	09/29/86	No
410199#	MANZANITA, CITY OF	TILLAMOOK COUNTY	10/18/74	05/01/78	01/12/82	05/01/78	No
410154#	MARION COUNTY*	MARION COUNTY	01/24/75	08/15/79	01/02/03	08/15/79	No
410233#	MAUPIN, CITY OF	WASCO COUNTY	12/13/74	09/24/84	09/24/84(M)	09/24/84	No
410255#	MCMINNVILLE, CITY OF	YAMHILL COUNTY	02/15/74	12/01/82	03/02/10	12/01/82	No
410096#	MEDFORD, CITY OF	JACKSON COUNTY	06/21/74	04/15/81	02/23/82	04/15/81	No
410143#	MILL CITY, CITY OF	LINN COUNTY	12/14/73	03/01/79	09/29/10	03/01/79	No
410284#	MILLERSBURG, CITY OF	LINN COUNTY	01/24/78	06/15/82	09/29/10	07/21/82	No
410210#	MILTON-FREEWATER, CITY OF	UMATILLA COUNTY	11/16/73	09/12/78	09/03/10	09/12/78	No
410019#	MILWAUKIE, CITY OF	MULTNOMAH COUNTY/CLACKAMAS	04/05/74	06/18/80	06/17/08	06/18/80	No

Federal Emergency Management Agency
Community Status Book Report
OREGON
Communities Participating in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
		COUNTY					
410247#	MITCHELL, CITY OF	WHEELER COUNTY	11/22/74	04/17/89	04/17/89	04/17/89	No
410020#	MOLALLA, CITY OF	CLACKAMAS COUNTY	11/21/75	06/17/08	(NSFHA)	06/15/79	No
410190#	MONMOUTH, CITY OF	POLK COUNTY	05/24/74	04/05/88	12/19/06	04/05/88	No
410010#	MONROE, CITY OF	BENTON COUNTY	11/08/74	09/26/75	01/03/86(M)	01/03/86	No
410079#	MONUMENT, CITY OF	GRANT COUNTY	10/18/74	09/24/84	09/24/84(M)	09/24/84	No
410173#	MORROW COUNTY *	MORROW COUNTY	01/24/75	04/01/81	12/18/07	04/01/81	No
410234#	MOSIER, CITY OF	WASCO COUNTY	10/18/74	02/17/89	02/17/89	02/17/89	No
410165#	MT. ANGEL, CITY OF	MARION COUNTY	05/14/74	01/19/00	(NSFHA)	06/30/76	No
410080#	MT. VERNON, CITY OF	GRANT COUNTY	12/20/74	09/18/87	09/18/87	09/18/87	No
410179#	MULTNOMAH COUNTY*	MULTNOMAH COUNTY	02/04/72	06/15/82	12/18/09	06/15/82	No
410064#	MYRTLE CREEK, CITY OF	DOUGLAS COUNTY	10/12/73	02/15/78	02/17/10	02/15/78	No
410047#	MYRTLE POINT, CITY OF	COOS COUNTY	11/23/73	07/16/84	09/25/09	07/16/84	No
410200#	NEHALEM, CITY OF	TILLAMOOK COUNTY	11/09/73	04/03/78	12/07/82	04/03/78	No
410256#	NEWBERG, CITY OF	YAMHILL COUNTY	06/14/74	03/01/82	03/02/10	03/01/82	No
410131#	NEWPORT, CITY OF	LINCOLN COUNTY	05/24/74	04/15/80	12/18/09	04/15/80	No
410048#	NORTH BEND, CITY OF	COOS COUNTY	06/28/74	08/01/84	09/25/09	08/01/84	No
410270#	NORTH PLAINS, CITY OF	WASHINGTON COUNTY	07/16/76	04/01/82	03/16/89	04/01/82	No
410221#	NORTH POWDER, CITY OF	UNION COUNTY	08/30/74	09/29/78	09/29/78	09/29/78	No
410151	NYSSA, CITY OF	MALHEUR COUNTY	11/30/73	12/14/82	12/14/82(M)	12/14/82	No
410271#	OAKLAND, CITY OF	DOUGLAS COUNTY	08/06/76	06/19/85	02/17/10	06/19/85	No
410126#	OAKRIDGE, CITY OF	LANE COUNTY	05/10/74	06/03/86	06/02/99	06/03/86	No
410152#	ONTARIO, CITY OF	MALHEUR COUNTY	11/30/73	04/17/84	04/17/84	04/17/84	No
410021#	OREGON CITY, CITY OF	CLACKAMAS COUNTY	12/28/73	02/15/80	06/17/08	02/15/80	No
410117#	PAISLEY, CITY OF	LAKE COUNTY	09/13/74	09/15/89	09/15/89	09/15/89	No
410211#	PENDLETON, CITY OF	UMATILLA COUNTY	05/24/73	11/03/78	09/03/10	07/13/76	No
410011#	PHILOMATH, CITY OF	BENTON COUNTY	02/22/74	06/15/82	06/15/82	06/15/82	No
410097#	PHOENIX, CITY OF	JACKSON COUNTY	06/21/74	05/03/82	05/03/82	05/03/82	No
410212#	PILOT ROCK, CITY OF	UMATILLA COUNTY	11/16/73	08/04/88	09/03/10	08/04/88	No
410186#	POLK COUNTY*	POLK COUNTY	02/07/75	02/15/78	12/19/06	02/15/78	No
410272#	PORT ORFORD, CITY OF	CURRY COUNTY	04/30/76	01/29/80	09/25/09	01/29/80	No
410183#	PORTLAND, CITY OF	WASHINGTON COUNTY/CLACKAMAS COUNTY/MULTNOMAH COUNTY	01/10/75	10/15/80	11/26/10	10/15/80	No
410049#	POWERS, CITY OF	COOS COUNTY	11/23/73	06/30/76	09/25/09(M)	06/30/76	No
410082#	PRAIRIE CITY, CITY OF	GRANT COUNTY	10/18/74	02/17/88	02/17/88	02/17/88	No
410037#	PRESCOTT, CITY OF	COLUMBIA COUNTY	01/10/75	08/16/88	11/26/10	08/16/88	No
410051#	PRINEVILLE, CITY OF	CROOK COUNTY	11/30/73	07/17/89	07/17/89	07/17/89	No
410038#	RAINIER, CITY OF	COLUMBIA COUNTY	05/24/74	08/16/88	11/26/10	08/16/88	No
410065#	REEDSPORT, CITY OF	DOUGLAS COUNTY	06/21/74	04/03/84	02/17/10	04/03/84	No
410066#	RIDDLE, CITY OF	DOUGLAS COUNTY	06/07/74	08/01/79	02/17/10	08/01/79	No
410022#	RIVERGROVE,CITY OF	CLACKAMAS COUNTY/WASHINGTON COUNTY	12/06/74	08/04/87	06/17/08	08/04/87	No
410201#	ROCKAWAY, CITY OF	TILLAMOOK COUNTY	06/14/74	09/29/78	10/12/82	09/29/78	No
410098#	ROGUE RIVER, CITY OF	JACKSON COUNTY	05/31/74	01/02/81	01/02/81	01/02/81	No
410067#	ROSEBURG, CITY OF	DOUGLAS COUNTY	06/07/74	06/01/77	02/17/10	06/01/77	No
410194#	RUFUS, CITY OF	SHERMAN COUNTY	12/13/74	09/24/84	09/24/84(M)	09/24/84	No
410167#	SALEM, CITY OF	POLK COUNTY/MARION COUNTY	08/09/74	06/15/79	01/02/03	06/15/79	No
410023#	SANDY, CITY OF	CLACKAMAS COUNTY	04/12/74	12/11/79	06/17/08	12/11/79	No
410039#	SCAPPOOSE, CITY OF	COLUMBIA COUNTY	05/17/74	12/19/75	11/26/10	08/16/88	No
410144#	SCIO, CITY OF	LINN COUNTY	11/22/74	08/01/84	09/29/10	08/01/84	No

Federal Emergency Management Agency
Community Status Book Report
OREGON
Communities Participating in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
410168#	SCOTTS MILLS, CITY OF	MARION COUNTY	12/20/74	03/01/79	01/02/03	03/01/79	No
410032#	SEASIDE, CITY OF	CLATSOP COUNTY	12/07/73	09/05/79	09/29/10	09/05/79	No
410081#	SENECA, CITY OF	GRANT COUNTY	11/22/74	09/24/84	09/24/84(M)	09/24/84	No
410099#	SHADY COVE, CITY OF	JACKSON COUNTY	08/23/74	09/30/80	09/30/80	09/30/80	No
410257#	SHERIDAN, CITY OF	YAMHILL COUNTY	10/18/74	03/02/10	03/02/10	08/01/80	No
410191#	SHERMAN COUNTY *	SHERMAN COUNTY	10/18/77	09/24/84	09/24/84(M)	09/24/84	No
410273#	SHERWOOD, TOWN OF	WASHINGTON COUNTY	08/13/76	01/06/82	01/06/82	01/06/82	No
410132#	SILETZ, CITY OF	LINCOLN COUNTY	03/19/76	03/01/79	12/18/09	03/01/79	No
410169#	SILVERTON, CITY OF	MARION COUNTY	05/10/74	03/01/79	01/02/03	03/01/79	No
410058#	SISTERS, CITY OF	DESCHUTES COUNTY	12/07/73	09/29/86	09/28/07	09/29/86	No
410248#	SPRAY, CITY OF	GRANT COUNTY	08/30/74	08/16/88	08/16/88(M)	08/16/88	No
415592#	SPRINGFIELD, CITY OF	LANE COUNTY	06/18/71	09/27/85	06/02/99	09/27/85	No
410040#	ST. HELENS, CITY OF	COLUMBIA COUNTY	11/30/73	09/29/86	11/26/10	09/29/86	No
410166#	ST. PAUL, CITY OF	MARION COUNTY	11/22/74	01/19/00	(NSFHA)	07/01/84	No
410213#	STANFIELD, CITY OF	UMATILLA COUNTY	11/09/73	08/15/84	09/03/10	08/15/84	No
410170#	STAYTON, CITY OF	MARION COUNTY	01/18/74	03/01/79	01/02/03	03/01/79	No
410222#	SUMMERVILLE, CITY OF	UNION COUNTY	06/05/79	01/15/80	01/15/80(M)	01/15/80	No
410007#	SUMPTER, CITY OF	BAKER COUNTY	12/24/76	09/24/84	06/03/88	09/24/84	No
410275#	SUTHERLIN, CITY OF	DOUGLAS COUNTY		02/17/10	02/17/10(M)	04/29/10	No
410146#	SWEET HOME, CITY OF	LINN COUNTY	01/18/74	03/01/82	09/29/10	03/01/82	No
410100#	TALENT, CITY OF	JACKSON COUNTY	05/31/74	02/01/80	04/16/04	02/01/80	No
410147#	TANGENT, CITY OF	LINN COUNTY	06/25/76	05/17/82	09/29/10	05/17/82	No
410237#	THE DALLES, CITY OF	WASCO COUNTY	05/24/74	01/18/84	01/18/84(M)	01/18/84	No
410276#	TIGARD, CITY OF	WASHINGTON COUNTY	02/14/78	03/01/82	02/18/05	03/01/82	No
410196#	TILLAMOOK COUNTY *	TILLAMOOK COUNTY		08/01/78	08/20/02	08/01/78	No
410202#	TILLAMOOK, CITY OF	TILLAMOOK COUNTY	06/07/74	05/01/78	04/16/04	05/01/78	No
410133#	TOLEDO, CITY OF	LINCOLN COUNTY	09/14/73	03/01/79	12/18/09	03/01/79	No
410184#	TROUTDALE, CITY OF	MULTNOMAH COUNTY	12/07/73	09/30/88	12/18/09	09/30/88	No
410277#	TUALATIN, CITY OF	WASHINGTON COUNTY/CLACKAMAS COUNTY	05/20/77	05/02/78	02/19/87	02/17/82	No
410171#	TURNER, CITY OF	MARION COUNTY	01/16/74	04/02/79	01/02/03	04/02/79	No
410279#	UKIAH, CITY OF	UMATILLA COUNTY	05/29/79	09/24/84	09/03/10(M)	09/24/84	No
410204#	UMATILLA COUNTY*	UMATILLA COUNTY		06/15/78	09/03/10	06/15/78	No
410214#	UMATILLA, CITY OF	UMATILLA COUNTY	11/09/73	09/24/84	09/03/10(M)	09/24/84	No
410216#	UNION COUNTY *	UNION COUNTY	10/25/77	05/15/80	04/03/96	05/15/80	No
410223#	UNION, CITY OF	UNION COUNTY	03/05/76	12/15/78	12/15/78	12/15/78	No
410153#	VALE, CITY OF	MALHEUR COUNTY	11/30/73	09/04/87	09/04/87	09/04/87	No
410128#	VENETA,CITY OF	LANE COUNTY	03/22/74	02/01/84	06/02/99	02/01/84	No
410041#	VERNONIA, CITY OF	COLUMBIA COUNTY	11/30/73	08/16/88	11/26/10	08/16/88	No
410134#	WALDPORT, CITY OF	LINCOLN COUNTY	03/22/74	03/15/79	12/18/09	03/15/79	No
410224#	WALLOWA COUNTY*	WALLOWA COUNTY	06/28/77	06/28/77	02/17/88	02/17/88	No
410228#	WALLOWA, CITY OF	WALLOWA COUNTY	12/28/73	04/23/76	02/17/88	02/17/88	No
410291#	WARM SPRING RESERVATION, TRIBE OF	WASCO COUNTY/JEFFERSON COUNTY		04/15/02	04/15/02	04/15/02	Yes
410033#	WARRENTON, CITY OF Includes the City of Hammond	CLATSOP COUNTY	06/28/74	05/15/78	09/29/10	05/15/78	No
410229	WASCO COUNTY *	WASCO COUNTY	02/21/75	09/24/84	09/24/84(M)	09/24/84	No
410195#	WASCO, CITY OF	SHERMAN COUNTY	10/22/76	09/15/89	09/15/89	09/15/89	No
410238#	WASHINGTON COUNTY*	WASHINGTON COUNTY	01/24/75	09/30/82	02/18/05	09/30/82	No
410148#	WATERLOO, CITY OF	LINN COUNTY		09/29/10	(NSFHA)	05/25/78	No
410024#	WEST LINN, CITY OF	CLACKAMAS COUNTY	12/17/73	03/15/77	06/17/08	03/15/77	No

Federal Emergency Management Agency
Community Status Book Report
OREGON
Communities Participating in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
410289#	WESTFIR, CITY OF	LANE COUNTY	12/04/84	08/19/85	06/02/99	09/06/85	No
410215#	WESTON, CITY OF	UMATILLA COUNTY	05/17/74	09/18/87	09/03/10	09/18/87	No
410245#	WHEELER COUNTY *	WHEELER COUNTY	05/31/77	07/17/89	07/17/89	07/17/89	No
410203#	WHEELER, CITY OF	TILLAMOOK COUNTY	09/13/74	11/16/77	11/16/77	11/16/77	No
410258#	WILLAMINA, CITY OF	YAMHILL COUNTY	12/28/73	03/15/82	03/02/10	03/15/82	No
410025#	WILSONVILLE, CITY OF	WASHINGTON COUNTY/CLACKAMAS COUNTY	03/29/74	01/06/82	06/17/08	01/06/82	No
415593#	WINSTON, CITY OF	DOUGLAS COUNTY		12/31/74	02/17/10	09/14/73	No
410185#	WOOD VILLAGE, CITY OF	MULTNOMAH COUNTY	05/10/74	12/18/09	(NSFHA)	11/20/85	No
410172#	WOODBURN, CITY OF	MARION COUNTY	05/24/74	03/01/79	01/02/03	03/01/79	No
410135#	YACHATS, CITY OF	LINCOLN COUNTY	11/01/74	03/01/79	12/18/09	03/01/79	No
410249#	YAMHILL COUNTY *	YAMHILL COUNTY	12/27/74	09/30/83	03/02/10	09/30/83	No
410259#	YAMHILL, CITY OF	YAMHILL COUNTY	11/30/73	03/02/10	03/02/10	03/01/82	No
410069#	YONCALLA, CITY OF	DOUGLAS COUNTY	04/05/74	02/17/10	02/17/10(M)	08/21/78	No

Summary:

Total In Flood Program	259
Total In Emergency Program	0
Total In the Regular Program	259
Total In Regular Program with No Special Flood Hazard	9
Total In Regular Program But Minimally Flood Prone	32

Federal Emergency Management Agency
Community Status Book Report
OREGON
Communities Not in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Sanction Date	Tribal
415594#	SODAVILLE, CITY OF	LINN COUNTY			09/29/10		No

Summary:

Total Not in Flood Program	1
Total Suspended from Emergency Program	0
Total Suspended from Regular Program	0
Total Withdrawn Communities Not In Program	0
Total Not In Program With Hazard Area Identified	1
Total Not In Program With Hazard Area Identified < 1 Year	0

Legend:

(E)	Indicates Entry In Emergency Program
NSFHA	No Special Flood Hazard Area - All Zone C
(>)	Date of Current Effective Map is after the Date of This Report
N/A	Not Applicable At This Time
(S)	Suspended Community
(W)	Withdrawn Community
(M)	No Elevation Determined - All Zone A, C and X
(L)	Original FIRM by Letter - All Zone A, C and X

Appendix B
Model Floodplain Ordinance

OREGON MODEL
FLOOD DAMAGE PREVENTION ORDINANCE
Effective January 1, 2009
Modified August 6, 2009

The link to the State of Oregon website where the 2009 version, or any later revised version of the Oregon Model Flood Damage Prevention Ordinance can be found is:

http://www.oregon.gov/LCD/HAZ/docs/floods/floodord.pdf

Appendix C
CRS Activities and Available Credits

Credit points awarded for CRS activities [source – FEMA CRS Manual (2013)].				
Activity	**Maximum Possible Points [1]**	**Maximum Points Earned [2]**	**Average Points Earned [3]**	**Percentage of Communities Credited [4]**
300 Public Information Activities				
310 Elevation Certificates	116	116	46	100%
320 Map Information Service	90	70	63	93%
330 Outreach Projects	350	175	63	90%
340 Hazard Disclosure	80	57	14	68%
350 Flood Protection Information	125	98	33	92%
360 Flood Protection Assistance	110	65	49	41%
370 Flood Insurance Promotion [5]	110	0	0	0%
400 Mapping and Regulations				
410 Floodplain Mapping	802	585	65	50%
420 Open Space Preservation	2,020	1,548	474	68%
430 Higher Regulatory Standards	2,042	784	214	98%
440 Flood Data Maintenance	222	171	54	87%
450 Stormwater Management	755	540	119	83%
500 Flood Damage Reduction Activities				
510 Floodplain Mgmt. Planning	622	273	123	43%
520 Acquisition and Relocation	1,900	1,701	136	23%
530 Flood Protection	1,600	632	52	11%
540 Drainage System Maintenance	570	449	214	78%
600 Warning and Response				
610 Flood Warning and Response	395	353	144	37%
620 Levees [6]	235	0	0	0%
630 Dams [6]	160	0	0	0%

1 The maximum possible points are based on the 2012 *Coordinator's Manual*.
2 The maximum points earned are converted to the 2012 *Coordinator's Manual* from the highest credits attained by a community as of October 1, 2011. Growth adjustments and new credits for 2012 are not included.
3 The average points earned are converted to the 2012 *Coordinator's Manual*, based on communities' credits as of October 1, 2011. Growth adjustments and new credits for 2012 are not included.
4 The percentage of communities credited is as of October 1, 2011.
5 Activity 370 (Flood Insurance Promotion) is a new activity in 2012. No community has earned these points.
6 Activities 620 and 630 were so extensively revised that the old credits cannot be converted to the 2012 *Coordinator's Manual*.

Appendix D
Sequencing Game


RiskMAP
Increasing Resilience Together
The Game
A Stakeholder Engagement Opportunity
Resilient Watershed
• Summarize actions taken to reduce risk, progress toward watershed vision, and understand the path ahead
• Continued NFIP Participation
Community Activity
FEMA Activity
Group Effort: FEMA, State, Communities, Tribes
Key Meetings and Events
Pitfall
Consultation Coordination Open House Meeting
Flood Risk Review Meeting
Resilience Meeting
Discovery Meeting
Start
STAKEHOLDER DATA
Conduct 6 Month Adoption Period
Maps Well Received
Federal Register Publication
Discuss The Preliminary Map and Its Implications
Share Flood Risk Information with Local Citizens and Businesses
Schedule CCO Meeting
Notify Stakeholders
Preliminary Map Release
Gain Confidence in Results
Build Understanding of Map Impacts
Preliminary Release Planning
Develop FIRM and FIS
Mitigation Planning Team Meeting
Community Feedback
Positive
Negative
Continue Analyzing Flood Hazards
Develop Project Charter
Budget Bust! Project resequenced
Go Back
Go Forward
Revalidate Sequencing
Validate Budget Estimates
Finalize Discovery Map
Draft Discovery Map
Develop Partnerships
Identify Local Champion
Identify Available Data
Sequence Watersheds
State Coordination on State Identified Study/ LIDAR Needs/Gaps
No Swimming
No Hunting
Don't Litter
Nature Area
Protect Levee

Appendix E
Criteria for Compliance in Urbanized Riparian Buffer Zones

Introduction

The approach described below offers one of the options for compliance under the programmatic consultation. Proposed actions that do not conform to these requirements must use a different pathway for ESA compliance, or meet the performance measure #1 standard. The community-based riparian buffer zone adjustment procedure described in performance measure #2.a. provides an alternate option for ESA coverage under the programmatic consultation. In addition, other pathways not included in the programmatic consultation offer additional options for FEMA, other Federal agencies, communities, or property owners to meet their ESA obligations (e.g., 4(d) rule, individual consultation under Section 7, or consultation under Section 10 via a Habitat Conservation Plan), as appropriate.

Optional Approach for Compliance in Urbanized Riparian Buffer Zones

The approach presented here applies the perspective that, under certain urbanized conditions, the development standards proposed by FEMA in the riparian buffer zone (RBZ) can be modified without adverse effect to ESA-listed species or their critical habitats. Instead of adjusting the RBZ boundary, this approach modifies the development standards within the RBZ.

For the scenario below, site eligibility[1] and any associated modifications to the proposed development standards proposed in FEMA's "performance measure" #1 are based upon the existing baseline condition at the time of the floodplain development permit submittal. The scenario describes floodplain areas that have been significantly altered by development and have lost many of the historic instream and riparian natural functions and processes. This scenario does include areas that may still provide largely unobstructed flood storage capacity, and/or areas that provide refuge for fish from high stream velocities during high flows. Some areas under this scenario may also provide opportunities for some level of future active or passive restoration. Consequently, in those cases where potential restoration opportunities exist, the development modification must ensure the future restoration potential remains the same or is improved upon.

Jurisdictions utilizing this approach will need a completed habitat assessment to support their decision. The assessment must demonstrate site eligibility, including data supporting that the only functions present, if any, are flood storage capacity and/or refugia for fish from high flow velocities. The assessment must also document the field review and analysis conducted to determine what potential exists for active or passive restoration in the proposed development site.

1. Scenario for Site Specific development modification within the RBZ:

[1] Site eligibility means an area in the RBZ that meets the stated baseline criteria which may modify FEMA's performance measure #1 development standards when it conforms to the modified development standards associated with the scenario (e.g., Scenario 2.b).

a. Eligibility – Areas meeting the following conditions are eligible for modification to the development standard described in FEMA's performance measure #1:
    i. Site provides little to no ecological function (baseline severely degraded)
    ii. The only substantive functions that remain, if any, are flood storage capacity and fish refugia from high velocities during floods.[2]
    iii. All other remaining functions provide minimal ecological value and loss of remnant function would equate to an insignificant effect[3]
    iv. Mitigation for loss of remaining substantive functions is feasible within a length equivalent to 14 times the bankfull channel width of the stream or river at the project site.[4]
b. Limitations - FEMA's performance measure #1 limitations shall not be eased:
    i. Within the 10-percent annual-chance flood zone (10-year floodplain)
    ii. Within 50 feet of any waterway. If any development reduces water quality, including associated stormwater management practices, to the associated waterway
    iii. If any development adversely impacts subsurface water storage capacity, quality, or connection to surface waters
c. Modified RBZ Development Standards – Development may occur within the proposed modification to the RBZ only after an assessment of the area for habitat restoration potential based on the 50-year horizon was performed and:
    i. No habitat restoration potential was determined, or
    ii. The degree of habitat restoration potential was determined, and
        1. The development proposal maintains or improves the potential for restoration, or
        2. The development is limited to open space type use with limited impervious surface (e.g., boardwalk and trails, City Park, playground equipment, open picnic shelter, natural area).

As stated in FEMA's performance measure #3, mitigation must include measures that avoid, minimize, replace, and/or provide other adequate compensatory mitigation for adversely impacted habitat functions and processes that potentially support ESA-listed species or that would be adversely impacted by the proposed action. Proposals must first avoid negative impacts to the greatest extent practicable through the incorporation of project design features and construction

[2] Areas store water during inundation, but have no infiltration potential. No subsurface connection exists between any water present in the area to subsurface aquifers or storage areas.
[3] Insignificant effects are so mild that at the site scale the effect cannot be meaningfully measured, detected, or evaluated and are determined without consideration of compensating mitigation.
[4] Meandering alluvial streams that are in equilibrium tend to repeat meander patterns within a recurring range. On average, the wavelength from one meander to the next generally ranges from the equivalent of 10 to 14 times the bankfull width of the river reach in question, hence the wider the river, the longer the wavelength. Under relatively natural conditions, channel forms and habitats within the same meander wavelength tend to be similar, hence compensatory mitigation within a meander wavelength tend to have greater in-kind benefits than compensatory measures that are further removed from the action area.

methods. Any remaining negative impacts must then be minimized, and any residual impacts are replaced and/or compensated to the maximum extent practicable.

Appendix F

List of Unincorporated Urbanized Communities in Oregon that are outside of the Urban Growth Boundary

Department of Land Conservation and Development

Survey of Oregon Unincorporated Communities

January 30, 1997

In 1993, the Department of Land Conservation and Development (DLCD) conducted a statewide survey of unincorporated communities (these areas were called "rural communities" at that time). The purpose of the survey was to gather information about such areas in order to assist in writing land use planning rules for such communities. The survey included a list of community names for each county, and also provided information about land uses and public facilities in these areas.

The Land Conservation and Development Commission (LCDC) adopted administrative rules for unincorporated communities in 1994 (OAR 660, Division 22). Because the survey had been conducted prior to the drafting of the related rules, counties had listed some areas in the survey that do not meet the formal definition of "unincorporated community." As such, not all the areas listed in the survey are subject to LCDC's rural communities rules.

In 1997, LCDC revised the unincorporated communities rules. The revised rules refer to the survey of unincorporated communities. During the public review process for these amendments several counties requested that LCDC add certain communities to the DLCD survey. These communities had not been listed in the original (1993) survey, but are similar to the other community areas listed on that survey. LCDC agreed to amend the survey so as to include these additional areas.

The attached survey is on file at DLCD as the official document referenced by the amended unincorporated communities rules. This document is a list of the communities named by each county. As with the 1993 survey, not all the areas listed in this, the amended (1997) survey, will qualify as an "unincorporated community" using the definition in Division 22. The 1993 survey, which is also available from DLCD, includes additional land use and public facilities information for each of the communities surveyed at that time.

Community	County
Bourne	Baker
Bridgeport	Baker
Carson	Baker
Cornucopia	Baker
Durkee	Baker
Hereford	Baker
Homestead	Baker
Keating	Baker
Langrell	Baker
McEwen	Baker
New Bridge	Baker
Oxbow	Baker
Pine	Baker
Pleasant Valley	Baker
Alpine	Benton
Alsea	Benton
Bellfountain	Benton
Blodgett	Benton
Bruce	Benton
Greenberry	Benton
Hoskins	Benton
Kings Valley	Benton
Summit	Benton
Wren	Benton
Beavercreek	Clackamas
Boring	Clackamas
Brightwood	Clackamas
Colton	Clackamas
Damascus	Clackamas
Government Camp	Clackamas
Mulino	Clackamas
Redland	Clackamas
Rhododendron	Clackamas
Welches/Wemme	Clackamas
Zig Zag	Clackamas
Arch Cape	Clatsop
Burnside	Clatsop
Cannon Beach Jct.	Clatsop
Elderberry	Clatsop
Elsie	Clatsop
Fish Hawk	Clatsop
Highway 26	Clatsop
Jewel	Clatsop
Knappa	Clatsop

Community	County
Miles xing/Jeffers	Clatsop
Necanicum/Hwy 53	Clatsop
Old Naval Hosp.	Clatsop
Olney	Clatsop
Smith Lake	Clatsop
Svensen	Clatsop
Sunset Beach	Clatsop
Westport	Clatsop
Alston Corner	Columbia
Birkenfeld	Columbia
Deer Island	Columbia
Goble	Columbia
Mist	Columbia
Warren	Columbia
Quincy	Columbia
Allegany	Coos
Arago	Coos
Bridge	Coos
Bandon Dunes	Coos
Broadbent	Coos
Bunker Hill/Mill	Coos
Charleston/Barview	Coos
Cooston	Coos
Dew Valley	Coos
Dora	Coos
Fairview	Coos
Glasgow	Coos
Greenacres	Coos
Hauser	Coos
Hollow Stump	Coos
Laurel Grove	Coos
Lower Lee Valley	Coos
Norway	Coos
Riverton	Coos
Sumner	Coos
Sunnyhill	Coos
Paulina	Crook
Post	Crook
Powell Butte	Crook
Powell Butte West	Crook
Agness	Curry
Langlois	Curry
Nesika Beach	Curry
Ophir	Curry

Community	County
Alfalfa	Deschutes
Black Butte	Deschutes
Brothers	Deschutes
Desch. R. Woods	Deschutes
Hampton	Deschutes
Inn of 7th Mtn	Deschutes
LaPine	Deschutes
Millican	Deschutes
Spring River	Deschutes
Sunriver	Deschutes
Terrebonne	Deschutes
Tumalo	Deschutes
Whistle Stop	Deschutes
Wickiup Junction	Deschutes
Wild Hunt	Deschutes
Azalea	Douglas
Camas Valley	Douglas
Clarks Branch	Douglas
Curtin	Douglas
Days Creek	Douglas
Dillard	Douglas
Dixonville	Douglas
Dry Creek	Douglas
Gardiner	Douglas
Glendale Junction	Douglas
Glide	Douglas
Green	Douglas
Jackson Creek	Douglas
Lookingglass	Douglas
Melrose	Douglas
Milo	Douglas
Nonpareil	Douglas
North Fork	Douglas
North Umpqua V.	Douglas
Oak Valley	Douglas
Quines Creek	Douglas
Rice Hill	Douglas
Riversdale	Douglas
Scottsburg/Wells	Douglas
Steamboat	Douglas
Tenmile/Portercrk	Douglas
Tiller	Douglas
Winchester Bay	Douglas
Fortune Branch	Douglas
Mayville	Gilliam
Mikkalo	Gilliam
Olex	Gilliam
Austin	Grant
Austin Junction	Grant
Dale	Grant
Fox	Grant
Galena	Grant
Hamilton	Grant
Izee	Grant
Kimberly	Grant
Logdel	Grant
Ritter	Grant
Susanville	Grant
Andrews	Harney
Buchanan	Harney
Crane	Harney
Diamond	Harney
Drewsey	Harney
Fields	Harney
Frenchglen	Harney
Lawen	Harney
Princeton	Harney
Riley	Harney
Wagontire	Harney
Mt. Hood	Hood River
Oak Grove	Hood River
Odell	Hood River
Parkdale	Hood River
Pine Grove	Hood River
Rockford	Hood River
Windmaster Cnr	Hood River
Van Horn	Hood River
Applegate	Jackson
Brownsboro	Jackson
Lakecreek	Jackson
Lincoln/Pinehurst	Jackson
McKee Bridge	Jackson
Prespect	Jackson
Ruch	Jackson
Trail	Jackson
Union Creek	Jackson
White City	Jackson
Wimer	Jackson

Community	County
Ashwood	Jefferson
Camp Sherman	Jefferson
Crooked Rvr Rnch	Jefferson
Chinook Airport	Jefferson
Gateway	Jefferson
High Chapparal	Jefferson
Kerby	Josephine
Merlin	Josephine
Murphy	Josephine
North Valley	Josephine
O'Brien	Josephine
Pottsville	Josephine
Shan Creek	Josephine
Selma	Josephine
Sunny Valley	Josephine
Wilderville	Josephine
Williams	Josephine
Wolf Creek	Josephine
Wonder	Josephine
Beatty	Klamath
Beaver Marsh	Klamath
Bly	Klamath
Chemult	Klamath
Crescent	Klamath
Crescent Lake	Klamath
Dairy	Klamath
Diamond Lake Jnct	Klamath
Fort Klamath	Klamath
Gilchrist	Klamath
Henley	Klamath
Keno	Klamath
Midland	Klamath
Olene	Klamath
Rocky Point	Klamath
Sprague River	Klamath
Adel	Lake
Alkalai Lake	Lake
Christmas Valley	Lake
Five Corners	Lake
Fort Rock	Lake
New Pine Creek	Lake
Plush	Lake
Silver Lake	Lake
Summer Lake	Lake
Valley Falls	Lake
Westside	Lake
Alvadore	Lane
Blachly	Lane
Blue River	Lane
Cheshire	Lane
Crow	Lane
Culp Creek	Lane
Cushman	Lane
Deadwood	Lane
Dexter	Lane
Dorena	Lane
Elmira	Lane
Fall Creek	Lane
Franklin	Lane
Glenada	Lane
Goshen	Lane
Greenleaf	Lane
Jasper	Lane
Lancaster	Lane
Leaburg	Lane
London	Lane
Lorane	Lane
Mapleton	Lane
Marcola	Lane
McKenzie Bridge	Lane
Nimrod	Lane
Noti	Lane
Pleasant Hill	Lane
Rainbow	Lane
Saginaw	Lane
Swisshome	Lane
Trent	Lane
Triangle Lake	Lane
Vida	Lane
Walterville	Lane
Walton	Lane
Beverly Beach	Lincoln
Burnt Woods	Lincoln
Eddyville	Lincoln
Elk City	Lincoln
Harlan	Lincoln
Kernville	Lincoln
Lincoln-Gleneden	Lincoln
Logsden	Lincoln
Nashville	Lincoln
Otis Junction	Lincoln

Community	County
Otter Rock	Lincoln
Rose Lodge	Lincoln
San Marine	Lincoln
Seal Rock	Lincoln
Star Creek	Lincoln
Tidewater	Lincoln
Cascadia	Linn
Crabtree	Linn
Crawfordsville	Linn
Holley	Linn
Lacomb	Linn
Peoria	Linn
Shedd	Linn
West Scio	Linn
Annex	Malheur
Arock	Malheur
Brogan	Mahleur
Burns Junction	Mahleur
Cairo Junction	Mahleur
Farewell Bend	Mahleur
Harper	Mahleur
Ironside	Mahleur
Jamieson	Mahleur
Johnson Brothers	Mahleur
Juntura	Mahleur
McDermitt	Mahleur
Oregon Slope	Mahleur
Owyhee Corner	Mahleur
Rome	Mahleur
Weiser Junction	Mahleur
Willowcreek	Mahleur
Brooks	Marion
Brooks Intchnge	Marion
Butteville	Marion
Central Howell	Marion
Drakes Crossing	Marion
Fargo Interchange	Marion
Hopmere	Marion
Labish Village	Marion
Lone Pine	Marion
Macleay	Marion
Marion	Marion
Mehama	Marion
Monitor	Marion
North Howell	Marion
North Santiam	Marion
Norton's Corner	Marion
Pratum	Marion
Quinaby	Marion
Shaw	Marion
St. Louis	Marion
Talbot	Marion
Waconda	Marion
West Stayton	Marion
Hardman	Morrow
Ruggs	Morrow
Bridal Veil	Multnomah
Burlington	Multnomah
Corbett (NSA)	Multnomah
Dodson (NSA)	Multnomah
Orient	Multnomah
Springdale	Multnomah
Warrendale (NSA)	Multnomah
Airlie	Polk
Ballston	Polk
Buell	Polk
Buena Vista	Polk
Derry	Polk
Eola	Polk
Fort Hill	Polk
Grand Rond	Polk
Lincoln	Polk
McCoy	Polk
Pedee	Polk
Perrydale	Polk
Rickreall	Polk
Suver	Polk
Suver Jct	Polk
Valley Jct	Polk
Biggs Jct	Sherman
Kent	Sherman
Barview	Tillamook
Beaver	Tillamook
Cape Meares	Tillamook
Cloverdale	Tillamook
Falcon Cove	Tillamook
Hebo	Tillamook
Idaville	Tillamook

Community	County	Community	County
Mohler	Tillamook	Meacham	Umatilla
Neahkahnie	Tillamook	Rieth	Umatilla
Neskowin	Tillamook	Umapine	Umatilla
Oceanside	Tillamook		
Netarts	Tillamook	Alice	Union
Pacific City/Woods	Tillamook	Anthony Lakes	Union
Syskeyville	Tillamook	Camp Elkanah	Union
Tierra Del Mar	Tillamook	Hotlake	Union
Twin Rocks	Tillamook	Medical Springs	Union
		Perry	Union
Flora	Wallowa	Spout Springs	Union
Imnaha	Wallowa	Starkey	Union
Minam	Wallowa	Telocaset	Union
Troy	Wallowa		
Wallowa Lake	Wallowa	Clarno	Wheeler
		Kinzua	Wheeler
Pine Grove	Wasco	Service Creek	Wheeler
Pine Hollow	Wasco	Twickenham	Wheeler
Tygh Valley	Wasco		
Walter's Corner	Wasco	Bellevue	Yamhill
Wamic	Wasco	Cove Orchard	Yamhill
		Grand Isl Jct	Yamhill
Buxton	Washington	Grande Ronde Agny	Yamhill
Cherry Grove	Washington	Hopewell	Yamhill
Laurelwood	Washington	Unionvale	Yamhill
Manning	Washington	Whiteson	Yamhill
Timber	Washington		
Verboort	Washington	Total = 403	