Draft Environmental Impact Statement

Draft Oregon Implementation Plan for NFIP-ESA Integration

August 2025

FEMA

Federal Emergency Management Agency
Region 10
Department of Homeland Security
130 – 228th Street SW
Bothell, WA 98021

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Draft Environmental Impact Statement

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Lead Agency: U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA)

Cooperating Agencies:
National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), Oregon Department of Conservation and Land Development (DLCD), Tillamook County, Benton County, Umatilla County, City of Portland

Title: Oregon Implementation Plan for National Floodplain Insurance Program (NFIP) – Endangered Species Act (ESA) Integration

Designation: Draft Environmental Impact Statement

Location: Oregon

Information Contact:

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Abstract:
The Draft Environmental Impact Statement (EIS) for the Oregon Implementation Plan for NFIP-ESA Integration evaluates the potential impacts of alternatives to how the NFIP is implemented in the Oregon plan area. In their 2016 Biological Opinion, the National Marine Fisheries Service (NMFS) concluded that, in the Oregon plan area, the NFIP is likely to jeopardize the continued existence of ESA-listed species, result in the destruction or adverse modification of designated critical habitat and have adverse effects on Essential Fish Habitat (EFH) for fishery resources.

The EIS evaluates three alternatives. The No Action Alternative considers the effects of not changing how the NFIP is implemented in the Oregon plan area. Two action alternatives evaluate the effects of requiring no net loss standards for development in floodplains in the Oregon plan area. The no net loss standards comprise mitigation ratios to offset impacts on three floodplain functions, riparian buffer zone (RBZ) requirements, as well as reporting requirements. The Oregon Implementation Plan for NFIP-ESA Integration would apply to all NFIP participating communities in the Oregon plan area.

Under Alternative 2, the no net loss standards would be required for all development proposals in the special flood hazard area that do not have ESA compliance documentation through other means. Alternative 3 would implement the no net loss standards for all development in the special flood hazard area regardless of ESA compliance through other means.

Reviewers should provide their comments to FEMA during the comment period for the Draft EIS. FEMA will analyze and respond to the comments and prepare a Final EIS. Comments on the Draft EIS should be specific and inform the Agency's selection among the alternatives.

FEMA's analysis finds that the anticipated effects on land use, economics, wetlands, transportation, and public and critical infrastructure, health, and safety may be significant under the proposed alternatives while impacts on fish & aquatic wildlife, including threatened and endangered species, may be significant under the no action alternative.

Comments on this document must be submitted by October 6, 2025.

Send Comments To: NFIP OR-EIS, FEMA, Region 10, 130 - 228th Street SW, Bothell, WA 98021; email: fema-r10-or-nfip-esa-integration@fema.dhs.gov; online at https://gather.cdmsmith.com/v/YD1Gd68ozby; or fax: 425-775-7560 Attention: FEMA NFIP OR EIS.

Table of Contents

Appendices

Figures

Tables

Acronyms and Abbreviations

ASFPM	Association of State Floodplain Managers
BFE	Base Flood Elevation
BGEPA	Bald and Golden Eagle Protection Act
BiOp	Biological Opinion
BMP	Best Management Practices
BRIC	Building Resilient Infrastructure and Communities
CAC	Community Assistance Contact
CAV	Community Assistance Visit
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLOMR	Conditional Letter of Map Revision
CLOMR-F	Conditional Letters of Map Revision Based on Fill
CRS	Community Rating System
CWA	Clean Water Act
dbh	Diameter at Breast Height
DHS	U.S. Department of Homeland Security
DLCD	Oregon Department of Land Conservation and Development
DOGAMI	Oregon Department of Geology and Mineral Industries
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FPA	Oregon Forest Practices Act
FR	Federal Register
GDP	Gross Domestic Product
GIS	Geographic Information Systems
H&H	Hydrologic and Hydraulic
HB	Oregon House Bill

HCP	Habitat Conservation Plan
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HUC	Hydrologic Unit Code
HUD	U.S. Department of Housing and Urban Development
IHP	Individuals and Households Program
LID	Low-impact Development
LODR	Letter of Determination Review
LOMA	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
LOMR-F	Letter of Map Revision Based on Fill
MBTA	Migratory Bird Treaty Act
MPO	Metropolitan Planning Organization
MRLC	Multi-Resolution Land Characteristics Consortium
MS4	Municipal Separate Storm Sewer System
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MT	Metric Tons
N.d.	No Date
NEPA	National Environmental Policy Act
NFIA	National Flood Insurance Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OAR	Oregon Administrative Rule
OCS	Oregon Conservation Strategy
ODA	Oregon Department of Agriculture
ODEQ	Oregon Department of Environmental Quality
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation

ODSL	Oregon Department of State Lands
ORS	Oregon Revised Statue
ORSC	Oregon Residential Specialty Code
OSSC	Oregon Structural Specialty Code
OTP	Oregon Transportation Plan
PA	Public Assistance
PDM	Pre-Disaster Mitigation
RBZ	Riparian Buffer Zone
RCRA	Resource Conservation and Recovery Act
RPA	Reasonable and Prudent Alternative
SB	Oregon Senate Bill
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Officer
UGB	Urban Growth Boundary
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOTUS	Waters of the U.S.

Executive Summary

ES.1. Introduction, Purpose, and Need

Congress developed the National Flood Insurance Act of 1968 (NFIA). With the passage of the NFIA, Congress created the National Flood Insurance Program (NFIP) to "provid[e] appropriate protection against the perils of flood losses" and to "minimiz[e] exposure of property to flood losses" (42 USC 4001l). The primary purpose and objective of the NFIP is to provide access to federally underwritten flood insurance. The NFIA was amended in 1973 to require the purchase of flood insurance as a condition of receiving federally underwritten loans and federal assistance in the special flood hazard area (SFHA).

The Federal Emergency Management Agency (FEMA) implements the NFIP. The NFIP was designed so that floodplain management would be regulated and carried out at the state and local levels where land use authority resides. Communities choosing to participate in the NFIP are required to adopt and enforce floodplain management regulations (e.g., ordinances) that meet the NFIP minimum floodplain management standards (44 Code of Federal Regulations [CFR] 59.2[b], 59.22, 60.1[d], 60.3[a]-[f], 60.6) to gain access to federally underwritten flood insurance and certain federal financial assistance.

Section 7(a)(2) of the Endangered Species Act (ESA) requires that each federal agency shall ensure that any action authorized, funded, or carried out by such agency (e.g., the NFIP) is not likely to jeopardize the continued existence of any threatened or endangered species (ESA-listed species) or result in the destruction or adverse modification of their designated critical habitat. Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to consult with the National Marine Fisheries Service (NMFS) regarding whether their actions may adversely affect essential fish habitat (EFH).

"Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02).

In 2011, FEMA consulted with NMFS under the ESA and the MSA on the implementation of the NFIP in Oregon. NMFS concluded in their 2016 Biological Opinion (BiOp) that the NFIP as implemented in the Oregon plan area is likely to result in jeopardy of 16 listed fish species and the Southern Resident killer whale, and it will result in destruction or adverse modification of designated critical habitat and will have adverse effects on EFH. Therefore, the purpose for the proposed action is to ensure that the implementation of the NFIP in the Oregon plan area is consistent with the requirements of the ESA and MSA.

The proposed action is needed to avoid jeopardizing the continued existence of listed species, and avoid, minimize, or otherwise offset potential adverse effects on EFH, while also maintaining consistency with FEMA's existing NFIP statutory and regulatory authorities and the program's

objectives. The proposed action is to modify the implementation of the NFIP in the Oregon plan area, as detailed in the 2024 Draft Oregon Implementation Plan for NFIP-ESA Integration (Appendix A).

ES.2. National Environmental Policy Act

Under the National Environmental Policy Act (NEPA), federal agencies are required to evaluate the environmental, social, and economic effects of their proposed action prior to making a decision. This Draft Environmental Impact Statement (EIS) has been developed in accordance with NEPA to evaluate the potential impacts on the natural and human environment of the proposed action and associated alternatives.

FEMA is the federal lead agency under NEPA. NEPA allows for the lead agency to invite other agencies to cooperate or participate in the preparation of NEPA documents. Cooperating agencies (42 United States Code [USC] 4336a) assist the lead federal agency by participating in the NEPA process and review impacts related to their jurisdiction or special expertise.

The following cooperating agencies have agreed to participate in development of this Draft EIS based on their special expertise or jurisdiction: NMFS, U.S. Fish and Wildlife Service (USFWS), the Oregon Department of Land Conservation and Development (DLCD), the City of Portland, and Tillamook, Benton, and Umatilla counties. To the extent feasible, the cooperating agencies have participated in the analysis by providing information, comments, and technical expertise to FEMA; participated in coordination meetings; and raised issues as early in the process as is reasonably feasible. FEMA initiated coordination with cooperating agencies in 2023 after initiating the EIS process. The cooperating agencies provided valuable input that was incorporated into the purpose, need, alternatives, and environmental analysis of alternatives.

ES.3. Oregon Implementation Plan for Endangered Species Act Integration

From 2017 to 2021, FEMA worked with DLCD, interested stakeholders, and considered input provided by NMFS to address the integration of ESA and MSA considerations in the implementation of the NFIP in the Oregon plan area, and FEMA developed the draft Oregon Implementation Plan for NFIP-ESA Integration (2021 Draft Implementation Plan). The 2021 Draft Implementation Plan was updated in 2024 and details FEMA's proposed action. The 2024 Draft Implementation Plan outlines no net loss standards for participation in the NFIP by Oregon communities within the plan area (**Figure ES-1**).[1] The no net loss standards include mitigation ratios to offset impacts on three floodplain functions, riparian buffer zone (RBZ) requirements, as well as reporting requirements.

[1] NFIP participating communities are defined as "any State or area or political subdivision thereof, or any Indian Tribe or authorized Tribal organization, or Alaska Native village or authorized native organization, which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction" (44 Code of Federal Regulations 59.1).

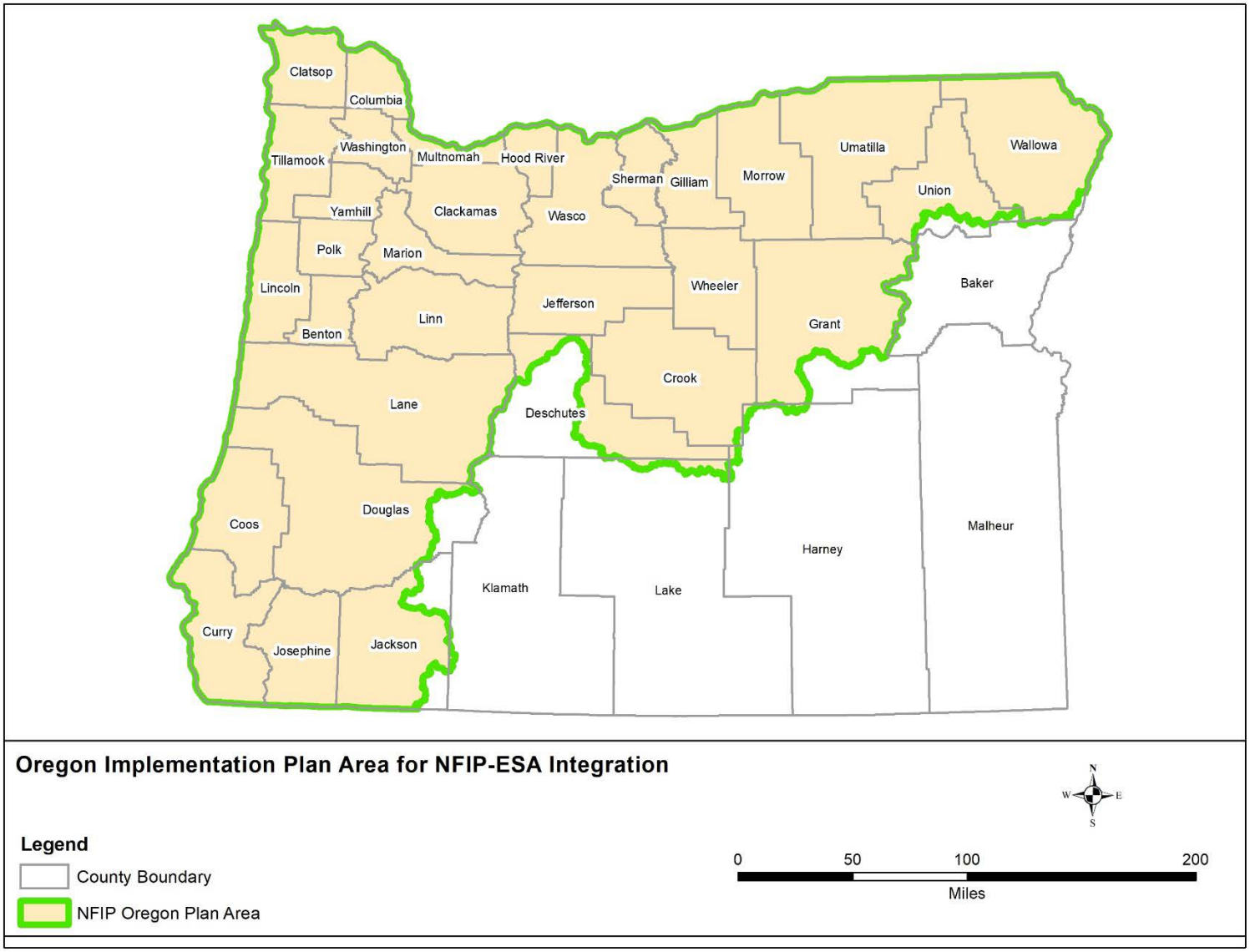

Figure ES-1. Oregon National Flood Insurance Program Plan Area for Endangered Species Act Integration

What is no net loss?

No net loss is a standard wherein adverse impacts must be avoided or offset through mitigation so that there is no net change in the function from the authorized existing condition.

The authorized existing condition is the state of the site when a floodplain permit application is submitted and assumes the resolution of all violations (e.g., unpermitted development).

The no net loss standards would apply to development actions that: 1) occur in an Oregon NFIP participating community within the plan area: 2) are in the special flood hazard area (SFHA) (e.g., Zones AE and VE as depicted on **Figure ES- 2.**) [2]; and 3) meet FEMA's definition of development.

Definition of Development and Special Flood Hazard Area

Development, as defined in 44 CFR 59.1, means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations, or storage of equipment or materials (44 CFR 59.1).

Note that the term “development” for the NFIP is not restricted to a building with walls and a roof. It includes any disturbance (permanent or temporary) of the ground, which may include structures with walls, but would also include development such as a new or expanded culvert, road, or driveway.

The SFHA is the land in the floodplain within a community subject to a 1 percent or greater chance of flooding in any given year. It is shown on the Flood Insurance Rate Map (FIRM) as Zone A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, or V1-30, VE, or V (44 CFR 59.1).

[2] https://www.fema.gov/sites/default/files/documents/how-to-read-flood-insurance-rate-map-tutorial.pdf

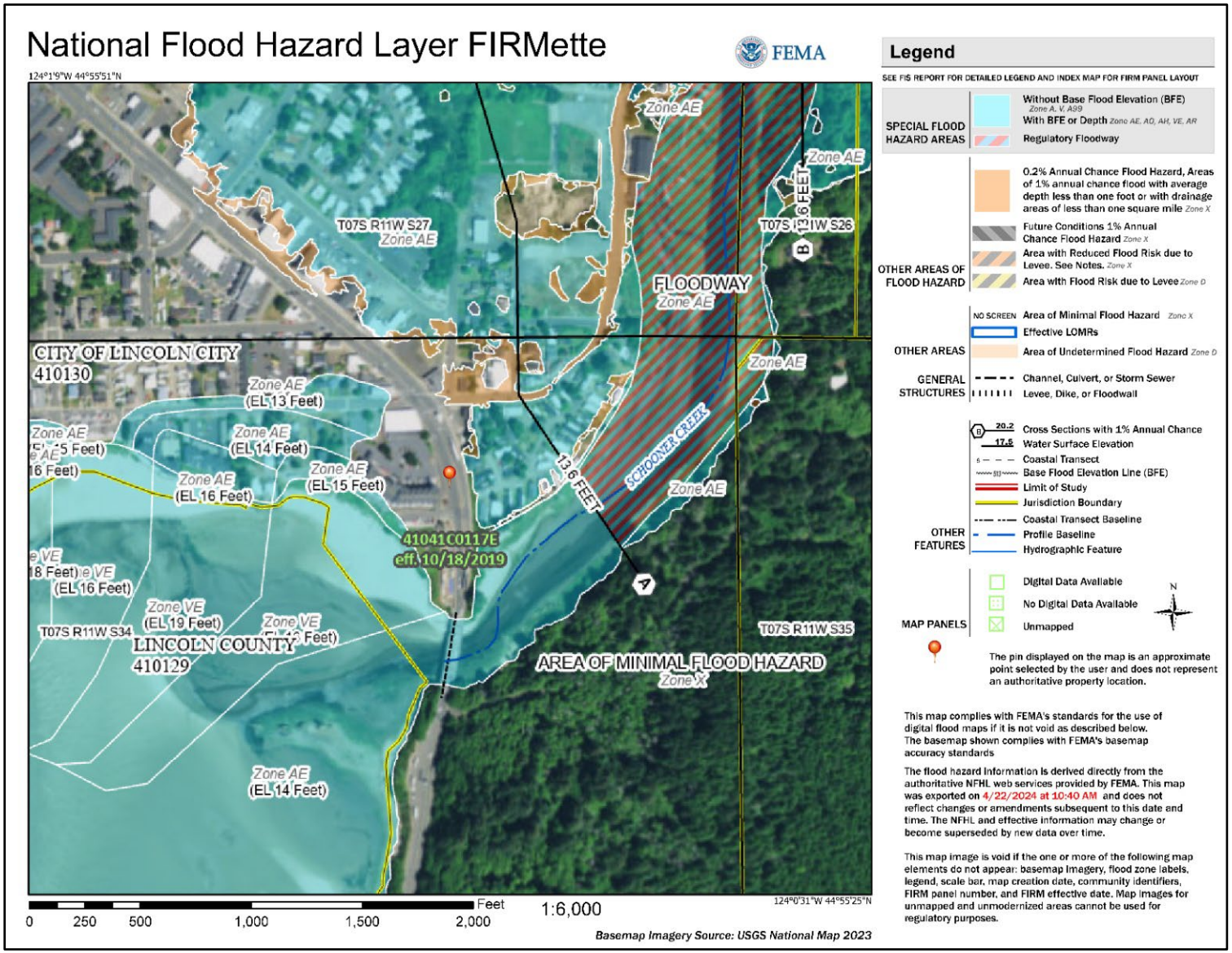

Figure ES-2. Special Flood Hazard Area (SFHA) Depicted on a Flood Insurance Rate Map

FEMA identified three floodplain functions for which the no net loss standards would apply. The floodplain functions FEMA identified are flood storage, water quality, and vegetation. FEMA identified the following proxies to measure impacts on the three floodplain functions from SFHA development:

1. Flood Storage Proxy: The flood storage capacity, which is the three-dimensional space (i.e., volume) between the existing ground and the base flood elevation with impacts measured as the volume occupied by a development.[3]
2. Water Quality Proxy: The extent of pervious surface in the SFHA measured as an area that is impacted by the creation of new impervious surface.
3. Vegetation Proxy: Trees 6 inches in diameter at breast height (dbh) or larger in the SFHA with impacts measured as the number of such trees removed by a development.

More information on the floodplain functions, proxies, and what would be mitigated is provided in the 2024 Draft Implementation Plan (Appendix A of this Draft EIS).

Mitigation would be required to offset impacts on the three floodplain functions, with increased mitigation ratios depending on the location of the impact (development) and mitigation, as shown in **Table ES.1**. Mitigation requirements apply to development located in the floodway, RBZ, or in the remainder of the SFHA.

The RBZ, based in part on its adjacency to waterways, provides a number of benefits to fish species both during and between flooding events. FEMA identified RBZ requirements as part of the no net loss standards, which include establishing a 170-foot buffer around waterbodies and planting requirements for development that is not dependent on being located in proximity to waterways.

The boundary of the RBZ is measured from the ordinary high water mark of a fresh waterbody (e.g., lake; pond; ephemeral, intermittent, or perennial stream) or from the mean higher-high water mark of a marine shoreline or tidally influenced river reach to 170 feet inland (**Figure ES- 3**).[4] The RBZ includes the area between these boundaries on each side of the waterway, including the waterway channel. Where the RBZ is larger than the SFHA, the no net loss standards would only apply to the area within the SFHA.

[3] The base flood elevation identifies the height that water will rise above the surface of the ground during the 1-percent annual chance flood (i.e., 100-year flood, SFHA).

[4] The U.S. Geological Survey defines freshwater as water containing less than 1,000 milligrams per liter of dissolved solids, most often salt. However, for the purposes of no net loss, fresh waterbodies are any waterbodies with a mapped SFHA that are not marine waters or tidally influenced waters.

Table ES.1. Proposed No Net Loss Mitigation Ratios and Multipliers from 2024 Draft Implementation Plan

Location of Impact	Proportion of Mitigation to Impact (Mitigation:Impact)				
	Flood Storage Capacity	Pervious Surface	Trees [3]		
			(6-inches dbh to 20-inches dbh)	(Greater than 20-inches dbh to 39-inches dbh)	(Greater than 39-inches dbh)
Impact Occurring in the Mapped Floodway [1]	2:1	1:1	3:1	5:1	6:1
Impact Occurring in the Riparian Buffer Zone (RBZ) [2]	2:1	1:1	3:1	5:1	6:1
Impact Occurring Outside the Floodway and RBZ, in remainder of SFHA	1.5:1	1:1	2:1	4:1	5:1
Mitigation Location Multipliers [4]					
Mitigation occurring on-site or off-site in the same reach [5]	100%	100%	100%	100%	100%
Mitigation occurring off-site, in a different reach, but within the same watershed (i.e., 10-digit Hydrologic Unit Code [HUC]) [6]	200%	200%	200%	200%	200%

Conditions:

1. *When the floodway is not mapped, the mitigation ratios for the RBZ and remainder of the SFHA would be used.*
2. *Impacts that occur in the RBZ must be mitigated in the RBZ.*
3. *Trees planted for mitigation do not have a specified dbh; however, they must be native species.*
4. *Mitigation multipliers of 100 percent result in the required mitigation occurring at the same value described by the ratios above, while multipliers of 200 percent result in the required mitigation being doubled.*
   a. *For example, if a development would create 1,000 square feet of new impervious surface, then 1,000 square feet of new pervious surface would need to be created. However, if only 500 square feet can be created on-site and in the same reach, the remaining 500 square feet created off-site along a different reach would need to be created at double the required amount as a result of the 200 percent multiplier. That is, another 1,000 square feet of pervious surface would need to be created at the off-site location, in addition to the 500 square feet created on-site.*
5. *Reach is defined as a section of a stream or river along which similar hydrologic conditions exist, such as discharge, depth, area, and slope. It can also be the length of a stream or river (with varying hydrologic conditions) between major tributaries or two stream gages, or a length of river for which the characteristics are described by readings at a single stream gage.*
6. *Watersheds are determined by the U.S. Geological Survey using the 10-digit HUC area.*

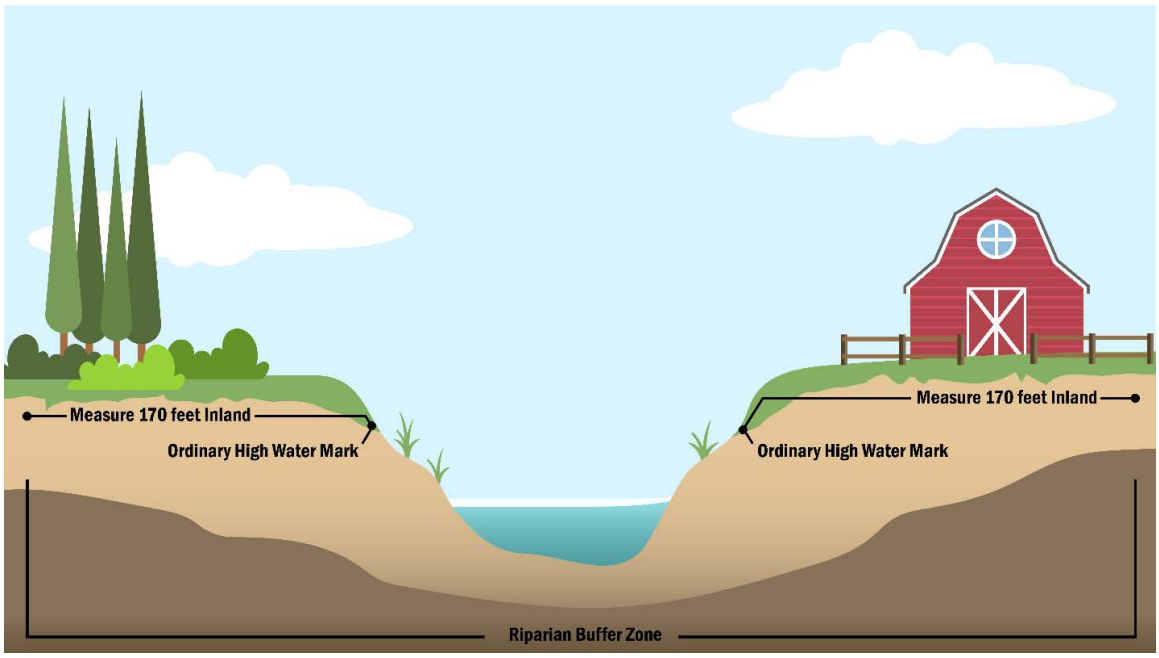

Figure ES-3. Riparian Buffer Zone

Development that is dependent on being located near a waterbody would need to be within the RBZ to function. These functionally dependent uses would require no net loss of the three floodplain functions per the mitigation ratios in **Table ES.1**. Development in the RBZ that is not a functionally dependent use would require an additional planting requirement, termed beneficial gain. FEMA is not proposing to limit development in the RBZ. Instead, FEMA identified mitigation ratios that reflect the importance of the RBZ in preserving floodplain functions and established the beneficial gain standard, which allows for development that is not functionally dependent on being located near a waterway to continue to occur in the RBZ while maintaining the floodplain functions of the RBZ in the long term. Beneficial gain plantings are in addition to plantings required for no net loss of vegetation, which requires mitigation for the removal of trees greater than 6 inches dbh.

Definitions of Functionally Dependent Use and Beneficial Gain

Functionally dependent use: A use which cannot perform its intended purpose unless it is located or carried out in proximity to water. The term includes docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage, parking, passenger waiting rooms, or related manufacturing facilities.

Beneficial Gain: FEMA's beneficial gain standard would apply to development that is not a functionally dependent use and occurs within the RBZ. The standard would require that an area within the RBZ, within the same reach as the project, and equivalent to 5 percent of the area impacted within the RBZ be planted with native riparian herbaceous, shrub, and tree vegetation.

Under the NFIP, any human-made change to improved or unimproved real estate in the SFHA requires a permit from the local floodplain administrator. However, not all permitted actions would require mitigation for impacts on floodplain functions. Activities not subject to the no net loss standards are described in Chapter 3 of this Draft EIS.

Four paths have been identified for communities to choose from to implement the no net loss standards. The four paths are a result of recognition by FEMA and its partner agencies of the diverse needs, capacities, policy contexts, and geographic constraints faced by NFIP participating communities in the Oregon plan area. Each community would select the path(s) that works best for them. The four paths are:

- Path A – A community would adopt a model ordinance developed by FEMA.
- Path B – A community would complete an ordinance checklist to demonstrate that all the required elements in the model ordinance are found in existing or newly adopted local, regional, or statewide enforceable requirements.
- Path C – A community would develop a customized community plan identifying their proposed approach to implementing the no net loss standards at the community level. The community would develop the plan, and FEMA would approve the plan prior to community implementation.
- Path D – Communities can pursue compliance with ESA at the community level by working directly with NMFS through the development of a Habitat Conservation Plan under ESA Section 10(a)(1)(B) or an ESA Section 4(d) Limit authorization, as appropriate. This path allows for alternatives to no net loss.

ES.4. Alternatives Analysis

Identifying and analyzing alternatives is an essential part of the NEPA decision-making process. Between mid-2015 and late 2023, FEMA engaged with agencies, Tribes, stakeholders, and other interested parties regarding the integration of ESA compliance into the NFIP in Oregon. FEMA hosted dozens of webinars, workshops, feedback sessions, and meetings, all of which informed the process to develop alternatives that would meet the purpose and need of the proposed action.

In addition, during the 92-day NEPA scoping period in 2023, FEMA hosted dozens of webinars, workshops, feedback sessions, and other meetings, all of which informed the process to develop alternatives that would meet the purpose and need of the proposed action. FEMA emphasized the request that the public submit possible reasonable alternatives, including additional or alternative avoidance, minimization, and mitigation measures that achieve the no net loss standards for the three floodplain functions.

As part of the alternatives development, FEMA screened alternatives, ideas, and options using the following three-part screening evaluation to identify reasonable alternatives: 1) consistent with purpose and need, 2) technically and economically feasible, and 3) implementation and anticipated impacts are different from those of other alternatives. This Draft EIS presents the No Action Alternative and two reasonable action alternatives that meet all three screening criteria.

ES.4.1. NO ACTION ALTERNATIVE (ALTERNATIVE 1)

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3 of this Draft EIS.

ES.4.2. NO NET LOSS WITH EXCEPTION FOR PROJECT-SPECIFIC ESA COMPLIANCE ALTERNATIVE (ALTERNATIVE 2)

Under Alternative 2, all communities participating in the NFIP in the Oregon plan area would be required to meet the standards of no net loss for NFIP-ESA integration. The no net loss standards would be implemented through avoidance, minimization, or mitigation measures as described in Chapter 3 of this Draft EIS. Applicability and exceptions are detailed in Section 3.3 of this Draft EIS.

*"No net loss standards" is an umbrella term that includes mitigation ratios to offset impacts on the three floodplain functions (**Table 1.1**), RBZ requirements (buffer zone and planting requirements, Section 3.3.1 of this Draft EIS) as well as reporting requirements (Section 3.3.5 of this Draft EIS).*

Under this alternative, a development proposal that has project-specific ESA compliance through other means would not need to implement the no net loss standards. For example, a project that needs a U.S. Army Corps of Engineers (USACE) permit, where USACE has documented compliance with the ESA (Section 1.1.2 of this Draft EIS), would have project-specific ESA compliance through USACE. Similarly, a development receiving federal funding (e.g., from FEMA disaster-related grant programs) would have project-specific ESA compliance from the federal funding agency documenting compliance with the ESA.

ES.4.3. NO NET LOSS WITHOUT EXCEPTIONS FOR PROJECT-SPECIFIC ESA COMPLIANCE (ALTERNATIVE 3)

Under Alternative 3, development in the Oregon plan area would be subject to the no net loss standards, as detailed in the 2024 Draft Implementation Plan and summarized in Section ES.3, regardless of whether it has project-specific ESA compliance through other means.

ES.5. Summary of Potential Impacts

This Draft EIS considered three categories of impact: direct, indirect, and cumulative. As discussed in Chapter 4 of this Draft EIS, there would be no direct impacts from the alternatives, other than the potential direct costs to FEMA for implementation. Development in the SFHA itself is not a federal action because FEMA does not authorize, fund, or carry out development under the NFIP.[5] Development in the SFHA is authorized by NFIP participating communities and subsequently carried out locally. However, indirect impacts would occur. The analysis of indirect impacts encompasses all

[5] FEMA does provide funding to communities for projects that may occur in the SFHA under programs other than the NFIP, such as through Public Assistance and Hazard Mitigation grants as well as under the National Flood Mitigation Fund established through the NFIA.

reasonably foreseeable actions. Further, the impact analysis includes a determination of impact magnitude and statement of significance at the Oregon plan area scale. The Oregon plan area scale thereby encompasses the cumulative incremental effects of the alternatives and reasonably foreseeable actions. As each of these discretionary decisions are made at the community, landowner, and developer levels, the sum of the various indirect effects would be the cumulative effect of the alternatives at the Oregon plan area scale.

Alternative 2 and Alternative 3 would have minimal adverse impacts on farmland soils, air quality, wild and scenic rivers, coastal resources, and noise and a slight beneficial effect on these resources, with the exception of farmland soils. Significant economic impacts under Alternative 2 and Alternative 3 would primarily be a result of the increased cost and complexity (e.g., design, review, permitting) to implement the no net loss standards for development within the SFHA and for communities to establish no net loss processes and reporting (e.g., administrative costs). However, Alternative 2 and Alternative 3 present a possible economic benefit to property owners in the SFHA and communities from potentially increased property values and associated tax revenues.

All three alternatives would result in adverse impacts on resources to varying degrees. However, Alternative 2 and Alternative 3 would have beneficial effects on certain physical (e.g., air quality), and biological resources when compared to the No Action Alternative. Alternative 2 and Alternative 3 would result in short-term adverse impacts on biological resources related to construction activities to implement the no net loss standards. Soil loss and compaction, vegetation alteration, and pollutants from construction equipment associated the with no net loss standards could impair habitat quality, reduce biodiversity, and alter habitat connectivity. The No Action Alternative would result in impacts to biological resources consistent with existing conditions, which NMFS determined would result in jeopardy of 16 listed fish species and the Southern Resident killer whale, result in destruction or adverse modification of designated critical habitat and adversely affect EFH. Compared to the No Action Alternative, Alternatives 2 and 3 would reduce impacts on biological resources in the long term by implementing the no net loss standards in the SFHA, which would result in beneficial effects on aquatic habitats and associated special-status species compared to the No Action Alternative. Some adverse impacts on terrestrial habitats and species may still occur under Alternatives 2 and 3 due to the potential for development to favor land outside the SFHA to avoid the cost and complexity of the no net loss standards.

Alternative 2 and Alternative 3 would have the same number of significant impacts; however, Alternative 3 would generally result in impacts and beneficial effects occurring more broadly than under Alternative 2 because the no net loss standards would be applied to developments both with and without project-specific ESA compliance through other means.

As discussed in Chapter 3 of this Draft EIS, under Alternative 2 and Alternative 3, implementation of the no net loss standards would meet the purpose and need, thereby ensuring that implementation of the NFIP in the Oregon plan area is consistent with the requirements of the ESA and MSA.

Table ES.2 presents the number of significant impacts for each alternative analyzed in this Draft EIS as well as potential beneficial effects.

Table ES.2. Significance of Impacts and Potential Beneficial Effects

Resource	No Action Alternative	Alternative 2	Alternative 3
Land Development, Use, and Value	No impact compared to existing conditions[1]	**Significant impact**	**Significant impact**
Economic Impacts	No impact compared to existing conditions[1]	**Significant impact**	**Significant impact**
Seismicity, Geology, Topography, Soils	No impact compared to existing conditions[1]	Less than significant impact; Beneficial effect	Less than significant impact; Beneficial effect
Water Quality	Less than significant impact[2]	Less than significant impact; Beneficial effect	Less than significant impact; Beneficial effect
Wetlands	No impact compared to existing conditions[1]	**Significant impact;** Beneficial effect	**Significant impact;** Beneficial effect
Floodplains	Less than significant impact[2]	Less than significant impact; Beneficial effect	Less than significant impact; Beneficial effect
Vegetation	**Significant impact**[2]	Less than significant impact; Beneficial effect	Less than significant impact; Beneficial effect
Terrestrial Wildlife	**Significant impact**[2]	Less than significant impact; Beneficial effect	Less than significant impact; Beneficial effect
Fish and Aquatic Wildlife	**Significant impact**[2]	Less than significant impact; Beneficial effect	Less than significant impact; Beneficial effect
Threatened and Endangered Species	**Significant impact**[2]	Less than significant impact; Beneficial effect	Less than significant impact; Beneficial effect
Cultural and Historic Resources	No impact compared to existing conditions[1]	Less than significant impact; Beneficial effect	Less than significant impact; Beneficial effect
Tribal Treaty Rights	**Significant impact**[2]	Less than significant impact; Beneficial effect	Less than significant impact; Beneficial effect
Hazardous Materials	No impact compared to existing conditions[1]	Less than significant impact; Beneficial effect	Less than significant impact; Beneficial effect
Transportation	No impact compared to existing conditions[1]	**Significant impact**	**Significant impact**
Public and Critical Infrastructure, Health, and Safety	No impact compared to existing conditions[1]	**Significant impact;** Beneficial effect	**Significant impact;** Beneficial effect
Total Significant Impacts	**5**	**5**	**5**
Total Beneficial Effects	**0**	**11**	**11**

Notes:
1. The general impact of development on a resource that would occur regardless of the alternative is analyzed as part of the existing conditions. Section 4.1.4 provides additional information.
2. Based on NMFS determination in the 2016 BiOp.

ES.6. Agency and Public Involvement

ES.6.1. SCOPING PROCESS AND COMMENTS

On March 6, 2023, FEMA published a notice of intent (NOI) in the Federal Register announcing their intent to prepare an EIS and to conduct in-person and virtual scoping meetings (88 Federal Register 13841). The NOI identified the process to provide written comments via the Federal Rulemaking Portal (https://www.regulations.gov, ID: FEMA-2023-0007) and explained that written and verbal comments would be accepted at the scoping meetings. To support the public engagement effort, FEMA established a plan-specific website at https://www.fema.gov/about/organization/region-10/oregon/nfip-esa-integration and updated the website throughout the scoping period. The website was identified in the NOI and included information about the in-person and virtual scoping meetings, key documents, maps, and copies of the slides used in the public meetings.

Over the three-month public scoping period, FEMA held seven in-person public meetings, five virtual public meetings, and 12 targeted audience virtual meetings. Over 400 individuals attended these meetings. During the scoping comment period, FEMA received approximately 100 comment letters and tabulated approximately 960 distinct comments from those letters. The majority of submissions were from local government, including cities and counties, individuals, and businesses/business groups. Stakeholders voiced a variety of concerns during the scoping comment period. FEMA considered the content of all comments received in determining the scope of the EIS. Chapter 5 summarizes all alternatives, information, and analyses submitted by state, Tribal, and local governments, and other public commenters during the scoping process. **Table ES.3** identifies where each comment topic area was addressed in the EIS.

Table ES.3. Scoping Comments EIS Reference

Topic	EIS Reference
Impacts – General	Impacts for each alternative are analyzed in Chapter 4 of the EIS. Economic impacts are further evaluated in Appendix D. Water quality impacts are further detailed in Appendix G. Biological resource impacts are further analyzed in Appendix H. Floodplain impacts are described in detail in Appendix I.
Proposed Action – Implement RPA2	FEMA's analysis of the 2016 NMFS BiOp as an alternative is available in Section 3.5.2 of the EIS.
Proposed Action – Buffer	The RBZ is described in Section 3.3.1.4 of the EIS as well as in the 2024 Draft Implementation Plan (Appendix A).
Costs- Litigation and Takings	Economic impacts associated with the alternatives are summarized in Section 4.3 of the EIS and detailed in Appendix D. The regulatory background for this EIS is detailed in Chapter 1.
Proposed Action – FEMA Action	FEMA's role under the NFIP is described in Chapter 1. FEMA's authority to implement the alternatives is described in Section 1.6.1 of the EIS and the 2024 Draft Implementation Plan (Appendix A).
Land Use – Planning	Land use planning is analyzed in Section 4.2 of the EIS.

Topic	EIS Reference
Land Use – Residential	Residential land use is analyzed in Section 4.2 of the EIS. Economic impacts on residential land uses are analyzed in Section 4.3.
Impacts – Infrastructure	Impacts to infrastructure are analyzed in Chapter 4 of the EIS, including infrastructure related to hazardous materials (Section 4.15), transportation (Section 4.16), public and critical infrastructure (Section 4.17), and the economic impact that affects infrastructure (Section 4.3).
Costs – to Public	Economic impacts associated with the alternatives are summarized in Section 4.3 of the EIS and detailed in Appendix D.
Impacts – Ports	Economic impacts associated with the alternatives are summarized in Section 4.3 of the EIS and detailed in Appendix D.
Status Quo/NFIP As Is	The No Action Alternative is analyzed in Chapter 4 of the EIS.
Alternatives – Withdrawal from NFIP	The impacts of withdrawing from the NFIP are detailed in the Frequently Asked Questions (Appendix B).
Proposed Action – Mapping	NFIP mapping is described in Section 1.3.1. FEMA's evaluation of the 2016 NMFS BiOp alternative, including changes to mapping, is available in Section 3.5.2 of the EIS.
Mitigation – Duplication	Duplicative mitigation is analyzed through the differences between Alternative 2 and Alternative 3. The 2024 Draft Implementation Plan explains how developers can work with federal, state, and local regulatory agencies and the floodplain administrator to identify opportunities to provide for multiple mitigation requirements within the same site, if feasible, to reduce duplication and costs.
Proposed Action – Development Definition	Development is defined in 44 CFR 59.1. The relationship between the alternatives and development is described in Section 2.6 of the 2024 Draft Implementation Plan (Appendix A).
Proposed Action – Community Paths	The Community Paths for compliance are summarized in Section 3.3.2 of the EIS and Chapter 4 of the 2024 Draft Implementation Plan (Appendix A).
Costs – General	Economic impacts associated with the alternatives are summarized in Section 4.3 of the EIS and detailed in Appendix D.
Mitigation – Other Restoration Projects	The relationship between restoration projects and the alternatives are described in Section 3.3 of the EIS and Section 2.7 of the 2024 Draft Implementation Plan (Appendix A). The potential to utilize future restorations projects to achieve no net loss under Path C is summarized in Section 3.3.2.3 of the EIS, Section 4.4 of the 2024 Draft Implementation Plan (Appendix A), and the Path C – Customized Community Plan guidance (Attachment D of the 2024 Draft Implementation Plan [Appendix A]).
Biological Resources – Fish	Biological resources, including fish, are analyzed in Section 4.10 of the EIS and detailed in Appendix H.

Topic	EIS Reference
NEPA Process	The NEPA process and purpose is summarized in Section 1.1.1 of the EIS. The alternatives development and screening process is detailed in Section 3.1 of the EIS. The agency and public involvement process is described in Chapter 5 of the EIS.
Alternatives	The alternatives are described in Chapter 3 of the EIS.
Proposed Action – Compatibility	The compatibility of the alternatives with existing federal, state, and local regulations are analyzed by resource in Chapter 4 of the EIS.
Costs – to Implement	Economic impacts associated with the alternatives are summarized in Section 4.3 of the EIS and detailed in Appendix D.
Mitigation	Mitigation methods are described in Section 3.3.1 of the EIS and Chapter 3 of the 2024 Draft Implementation Plan (Appendix A).
Proposed Action – Implementation Plan	The 2024 Draft Implementation Plan is available in Appendix A.

ES.6.2. PUBLIC PARTICIPATION PROCESS ON DRAFT EIS AND NEXT STEPS

This Draft EIS will include a public review and comment period where FEMA will request input on the alternatives analysis and impact findings. FEMA will consider all input received during this Draft EIS public review and comment period. FEMA will develop a Final EIS and identify a preferred alternative. FEMA will develop a Record of Decision and identify a selected alternative.

Chapter 1. Introduction

The Federal Emergency Management Agency (FEMA), under the U.S. Department of Homeland Security (DHS), is preparing this Draft Environmental Impact Statement (EIS) to evaluate proposed modifications to the implementation of the National Flood Insurance Program (NFIP) in the Oregon plan area. Congress established the NFIP to provide access to federally underwritten flood insurance to property owners and to reduce future flood losses (see Section 1.2). Communities participate in the NFIP by adopting maps and floodplain management standards to reduce flood risks in alignment with the NFIP. [6] Once a community adopts maps and standards, flood insurance through the NFIP is made available to the public.

In 2011, FEMA consulted with the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) on the implementation of the NFIP in the Oregon plan area. NMFS concluded in their 2016 Biological Opinion (BiOp) that the implementation of the NFIP in the Oregon plan area is likely to jeopardize the continued existence of 16 ESA-listed fish species and the Southern Resident killer whale (see Section 1.5). NMFS also concluded that the implementation of the NFIP in the Oregon plan area will have adverse effects on Essential Fish Habitat (EFH) for Pacific salmon, coastal pelagic species, highly migratory species, and groundfish as protected under the MSA. In developing the draft Oregon Implementation Plan for NFIP-ESA Integration (2021 Draft Implementation Plan), FEMA worked with the Oregon Department of Land Conservation and Development (DLCD) and interested stakeholders, and considered input provided by NMFS, to address the integration of ESA and MSA considerations into the implementation of the NFIP in the Oregon plan area (see Section 1.6) (FEMA 2021). The 2021 Draft Implementation Plan was updated in 2024 and details FEMA's proposed action to make changes to the implementation of the NFIP in the Oregon plan area (see Section 1.7) for NFIP-ESA integration. The 2024 Draft Implementation Plan is available in Appendix A. Under the National Environmental Policy Act (NEPA), federal agencies are required to evaluate the environmental, social, and economic effects of their proposed action prior to making a decision. This Draft EIS has been developed in accordance with NEPA to evaluate the potential impacts on the natural and human environment of the proposed action.

The proposed action is to modify the implementation of the NFIP in the Oregon plan area as detailed in the 2024 Draft Implementation Plan (Appendix A).

[6] NFIP communities are defined as "any State or area or political subdivision thereof, or any Indian Tribe or authorized Tribal organization, or Alaska Native village or authorized native organization, which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction" [44 Code of Federal Regulations (CFR) 59.1].

1.1. Regulatory Context

1.1.1. NATIONAL ENVIRONMENTAL POLICY ACT

NEPA was enacted in 1970 and requires federal agencies to evaluate the environmental, social, and economic effects of their proposed actions and alternatives prior to making a decision. Under NEPA, agencies are required to provide opportunities for the public to review and comment on the evaluations. FEMA prepared this Draft EIS to disclose the potential impacts of the potential modifications to the implementation of the NFIP in the Oregon plan area on people and the environment and to provide the public opportunities for input on decisions that may affect their communities.

FEMA prepared this Draft EIS in accordance with NEPA, as amended; the DHS Directive 023-01-01, DHS Instruction 023-01-001; FEMA Directive 108-1, and FEMA Instruction 108-01-1 to meet the agency's obligations under NEPA, 42 United States Code (USC) 4321 et seq. FEMA acknowledges that on February 25, 2025, the Council on Environmental Quality (CEQ) published an Interim Final Rule, 90 FR 10610, *Removal of National Environmental Policy Act Implementing Regulations*. FEMA published a Notice of Intent (NOI) to prepare an EIS under NEPA on March 6, 2023 (88 Federal Register [FR] 13841). Therefore, this Draft EIS conforms to the CEQ regulations that were in place at the time the NOI was published and the guidance issued by CEQ on February 19, 2025.

1.1.2. ENDANGERED SPECIES ACT

The ESA was enacted in 1973 and provides a program for the conservation of threatened and endangered species as well as the habitats in which they are found. Under Section 7(a)(1), federal agencies, including FEMA, are required to utilize their authorities to carry out programs for the conservation of endangered and threatened species (ESA-listed species). Section 7(a)(2) of the ESA requires federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any ESA-listed species or result in the destruction or adverse modification of designated critical habitat (16 USC 1536(a)–(d)).

"Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02).

As such, because FEMA administers the NFIP, FEMA is required to promote the conservation of ESA-listed species and consult with NMFS and the U.S. Fish and Wildlife Service (USFWS), in accordance with ESA. See Section 1.5 for details on FEMA's consultation on the implementation of the NFIP in the Oregon plan area.

Section 9 of the ESA prohibits the import, export, or take of endangered species for any purpose. The term "take" means to harass, hunt, shoot, capture, trap, kill, collect, wound, harm, or pursue endangered species, or attempt any of these activities. Section 4(d) of the ESA extends Section 9 prohibitions to threatened species. Section 9 and Section 4(d) violations could result in penalties

and enforcement under Section 11 of the ESA. Civil penalties and criminal violations may result in fines of up to $25,000 for each violation or result in imprisonment. These penalties could accrue to actions that would take listed species or adversely affect critical habitat, such as land development.

However, there are some conditions under which take of an ESA-listed species may be authorized. Permits and authorizations, such as an Incidental Take Statement issued with approval of a Habitat Conservation Plan (HCP) under Section 10 of the ESA, allow for the unintentional take of ESA-listed species that may occur through otherwise lawful activities. Such permits and authorizations are issued by NMFS or USFWS for species under their respective jurisdictions.

1.1.3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The MSA establishes a national program for the conservation and management of fishery resources of the U.S. One component of fishery resources is Essential Fish Habitat (EFH), defined by the MSA as the waters and substrate that are necessary for fish to spawn, breed, feed, and grow to maturity. The MSA established Regional Fishery Management Councils, which are responsible for developing and implementing fishery management plans to restore depleted stocks of fish and identify EFH that is vulnerable to impairment from development. Once EFH has been identified, federal agencies must consult with the Secretary of Commerce (through NMFS) regarding whether their actions, such as the NFIP, may adversely affect EFH per Section 305(b)(2) of the MSA.

1.1.4. NATIONAL FLOOD INSURANCE ACT AND NATIONAL FLOOD INSURANCE PROGRAM

Following the devastating floods that accompanied Hurricane Betsy in 1965, Congress developed the National Flood Insurance Act of 1968 (NFIA). With the passage of the NFIA, Congress created the NFIP to “provid[e] appropriate protection against the perils of flood losses” and to “minimiz[e] exposure of property to flood losses” (42 USC 4001l).

The primary purpose and objective of the NFIP is to provide access to federally underwritten flood insurance. The NFIA was amended in 1973 to require the purchase of flood insurance as a condition of receiving federally underwritten loans and federal assistance in the special flood hazard area (SFHA, see Section 1.3.1.2). See Appendix B for additional details on federal assistance associated with the NFIA.

Congress also provided for the development of a floodplain management program that would encourage NFIP participating communities to reduce future flood losses nationwide through sound land use practices including community-enforced building codes and zoning (42 USC 4001(c) and (e)):

> "(1) encourag[ing] State and local governments to make appropriate land use adjustments to constrict the development of land which is exposed to flood damage and minimize damage caused by flood losses, (2) guid[ing] the development of proposed future construction, where practicable, away from locations which are threatened by flood hazards..." (42 USC 4001(e)).

This aspect of the NFIP is qualified in very important ways. FEMA is not directed to require state and local governments to constrict the development of land exposed to flood damage, but to "encourage" them to do so. Similarly, the purpose of "guid[ing]" development of proposed future construction away from locations that are threatened by flood hazards is constrained by the limits of practicability (i.e., "where practicable")" (42 USC 4001(e)(2)).

While the language of the NFIA certainly indicates an intent by Congress to encourage, through the mechanism of the NFIP, state and local communities to guide new development away from flood hazard areas, this is not intended as a central purpose of the NFIP. The NFIP establishes minimum floodplain management standards, communities that chose to participate in the NFIP must adopt and enforce these standards to gain access to federally underwritten flood insurance and federal financial assistance (see Section 1.2 for additional information).

In support of the flood insurance and floodplain management aspects of the program, the NFIP also provides flood risk information to help communities make risk informed decisions about development that they allow in the SFHA of their community. This information is reflected on the Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS), which identify the regulatory flood zones to which the minimum floodplain management standards apply, as well as in other non-regulatory products that the NFIP provides to communities to further inform their decision processes with regards to protecting development in the community from flooding. See Section 1.3.1 for additional information on floodplain mapping.

1.2. Implementation of the National Flood Insurance Program

Participation in the NFIP is based on a voluntary agreement between participating (Tribal, state, or local) communities and the federal government. If a community adopts and enforces regulations (e.g., floodplain management ordinance) that meet certain minimum requirements to reduce future flood risks within the SFHA, the federal government will make flood insurance available to property owners and lessees in that community.

FEMA has no land use authority. The power to regulate development in the floodplain, including adopting ordinances, requiring and approving permits, inspecting property, and citing violations requires land use authority. The regulation of land use falls under the state's police powers, which the Constitution reserves to the states, and the states delegate this power down to their respective political subdivisions. FEMA has no direct involvement in the administration of local floodplain management ordinances. The NFIP operates as a federal-state-local partnership that depends on state statutes and regulations authorizing local governments to regulate floodplain development under the state's police powers to protect the health, safety, and general welfare of its residents. The NFIP was designed so that Tribal, state, and local governments, where land use authority resides, would regulate floodplain development.

Communities are not legally required to participate in the program; they participate voluntarily to obtain access to NFIP flood insurance and federal assistance. FEMA has set forth in federal regulations the minimum standards required for participation in the NFIP. Communities choosing to

participate in the NFIP are required to adopt and enforce floodplain management regulations (e.g., codes and ordinances) that meet the NFIP minimum floodplain management standards (44 CFR 59.2(b), 59.22(a)(3), 60.1(d), 60.3(a)-(f), 60.6). Legal enforcement of floodplain management standards is the responsibility of participating NFIP communities, which also can elect to adopt higher standards to mitigate flood risk.

The NFIP Community Rating System (CRS) was implemented in 1990 as a voluntary program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP floodplain management standards and was codified under the National Flood Insurance Reform Act (42 USC 4022(b)). For example, under the CRS, communities could receive credit for designating land as open space where critical habitat under the ESA is present.

The intent of the CRS is for local communities participating in the NFIP to adopt higher floodplain management standards to further reduce flood risk and loss of life and property. For the most part, local governments bear the responsibility for protecting residents from flood hazards, working to reduce flood damage, and preserving floodplain functions and resources. The State of Oregon has, in Oregon Revised Statute (ORS) 203.035 (counties) and ORS 197.175 (cities), delegated the responsibility to local government units to adopt floodplain management regulations designed to promote the public health, safety, and general welfare of its residents.

1.2.1. OREGON STATEWIDE LAND USE PLANNING GOALS

The system of land use planning in Oregon is founded in 19 statewide land use planning goals. The goals address the processes of land use planning and resource preservation, provide guidance for urban and rural development, and provide direction for cities and counties planning for coastal assets. While the statewide planning goals are accompanied by guidelines, the guidelines are not mandatory but provide suggestions on how a goal may be applied through local comprehensive planning. Specifically, Goal 7: Areas Subject to Natural Hazards contains policies and guidance for the protection of people and property from natural hazards as well as planning considerations regarding the benefits of maintaining natural hazard areas as open space, recreation, and other low-density uses (Oregon State 2001).

The 19 planning goals are implemented through the ORS and Oregon Administrative Rules (OAR). The ORS contain the laws enacted or revised by the Oregon legislature and governor or passed by a vote through the initiative process. The OAR comprise the regulations that state agencies adopt to carry out statutes from the Oregon legislature. The ORS and OAR regulate land use planning in Oregon and provide context for the requirements communities must meet when making local land use decisions. For example, OAR 660-024 under Goal 14: Urbanization requires that cities and counties establish and maintain urban growth boundaries to contain urban development and ensure efficient use of land. However, in March 2024, the Oregon legislature passed a bill granting cities a one-time exemption to add new lands for housing developments (Marx 2024).

Specific ORS and OAR that are applicable to resources analyzed in this EIS are discussed in more detail in Chapter 4, within their respective resource sections.

1.3. National Flood Insurance Program

The following sections describe the components of the NFIP. Nothing in this section would change as a result of the proposed action or alternatives. Additional information about the implementation of the NFIP in Oregon is available through DLCD at https://www.oregon.gov/lcd/NH/Pages/NFIP.aspx.

1.3.1. FLOOD HAZARD MAPPING

Through its flood hazard mapping program, FEMA identifies flood hazards, assesses flood risks, and collaborates with states and communities to provide flood hazard and risk data. The NFIA requires that FEMA identify flood risk zones to provide the data necessary for FEMA to determine the appropriate minimum floodplain management standards and to contribute to the establishment of flood insurance premiums. While a variety of flood zones are mapped on FIRMs, the 1-percent-annual-chance flood (or 100-year flood) is the standard used for implementation of the NFIP. Mapping of flood hazards promotes public awareness of the degree of hazard within such areas and provides for the expeditious identification and dissemination of flood hazard information.

1.3.1.1. Requirements

The NFIA requires FEMA to prepare and distribute mapping that identifies areas of flood hazard and flood elevations as well as other information necessary for identification of flood hazard and risk (42 USC 4101, 4101b). FEMA is further required by statute to revise and update flood hazard maps in the following circumstances: (a) upon a determination that such revision or updates are necessary, or (b) upon request from any state or community, if accompanied by technical data sufficient to justify the requested change (42 USC 4101(f)). The regulations establishing FEMA's process for identification and mapping of flood hazards are provided in 44 CFR Parts 64, 65, 67, 70, and 72. To assess flood hazards in a community, FEMA conducts FISs and publishes FIS reports that describe the flood hazards for the community. Changes to flood hazard areas and flood elevations are subject to due process requirements as set forth in 42 USC 4104 and 44 CFR Part 67. FEMA uses the information developed in the FIS to prepare the FIRM. FEMA also prepares a FIRM database, which is a geographic information systems (GIS) version of the FIRM and includes most of the quantitative data from the FIS.

FEMA publishes FISs and FIRMs for distribution to a wide range of users: private residents, community officials, insurance agents and brokers, lending institutions, and other federal agencies. The flood hazard data presented on FIRMs is digitally displayed through the National Flood Hazard Layer. FISs and FIRMs can be accessed through FEMA's Flood Map Service Center.[7]

1.3.1.2. Information Shown on Flood Insurance Rate Maps

The information shown on the FIRM for a community depends on the type, extent, and severity of flood hazards present in the community; the location and level of existing and projected future development in the community; available funding resources; and FEMA's collaboration with the community to determine the extent of analysis and mapping to be performed. Consequently, FEMA

[7] https://msc.fema.gov/portal/home

prepares different levels of mapping for different communities. For example, for an area of a community that is already highly developed or is undergoing high levels of development, FEMA may prepare a FIRM using detailed hydrologic and hydraulic analyses, base flood elevations (BFE), and FEMA-designated floodways; but for a large, rural area of a county, with limited population and potential for future development, FEMA may prepare a FIRM that primarily features SFHAs determined using approximate methods and that do not identify BFEs or floodways.

FEMA uses the FIRM to present the information described below. Technical data supporting these elements may be found in the FIS report that FEMA prepares with a FIRM. **Figure 1-1** is an illustrative FIRMette (portion of a full FIRM) from Lincoln City, Oregon.[8]

Special Flood Hazard Areas

FIRMs are used to identify SFHAs, defined as areas that are subject to flooding during an event that has a 1 percent chance of occurrence each year (also known as the "base flood" or "100-year flood") (44 CFR 59.1). The SFHA is the basis for the insurance and floodplain management requirements of the NFIP. SFHAs may be associated with inland flooding sources, such as rivers, streams, and lakes, or with coastal flooding sources, such as bays, estuaries, and open coastlines. Inland flood zones and coastal flood zones with wave heights less than three feet are identified as Zone A, Zone AE, Zone A1-A30, Zone AH, Zone AO, Zone AR (including "dual" zones – Zones AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO), and Zone A99. Coastal flood zones determined to be high hazard areas with wave heights greater than three feet are identified as Zone V, Zone VE, and Zone V1-V30. The SFHA in Lincoln City as illustrated in **Figure 1-1** includes both Zone AE and Zone VE.

Base Flood Elevations

FIRMs and FISs may also provide BFE data, which identifies the flood elevations for the 1-percent-annual-chance flood (i.e., SFHA). FEMA uses detailed hydrologic, hydraulic, and coastal analyses to develop BFEs. In **Figure 1-1**, the BFE ranges from 13 feet to 19 feet.

Other Flood Zones

FIRMs may show areas of moderate flood risk that are outside of SFHAs. These areas, which are designated Zone X (shaded) or Zone B, include areas subject to inundation during a flood having a 0.2 percent chance of occurrence each year (also known as the "500-year flood"); other identified flood hazards, such as those resulting from a drainage area of less than 1 square mile; and areas protected by accredited levees. Mandatory flood insurance purchase requirements and the minimum floodplain management standards of the NFIP do not apply in these zones.

[8] https://www.fema.gov/sites/default/files/documents/how-to-read-flood-insurance-rate-map-tutorial.pdf

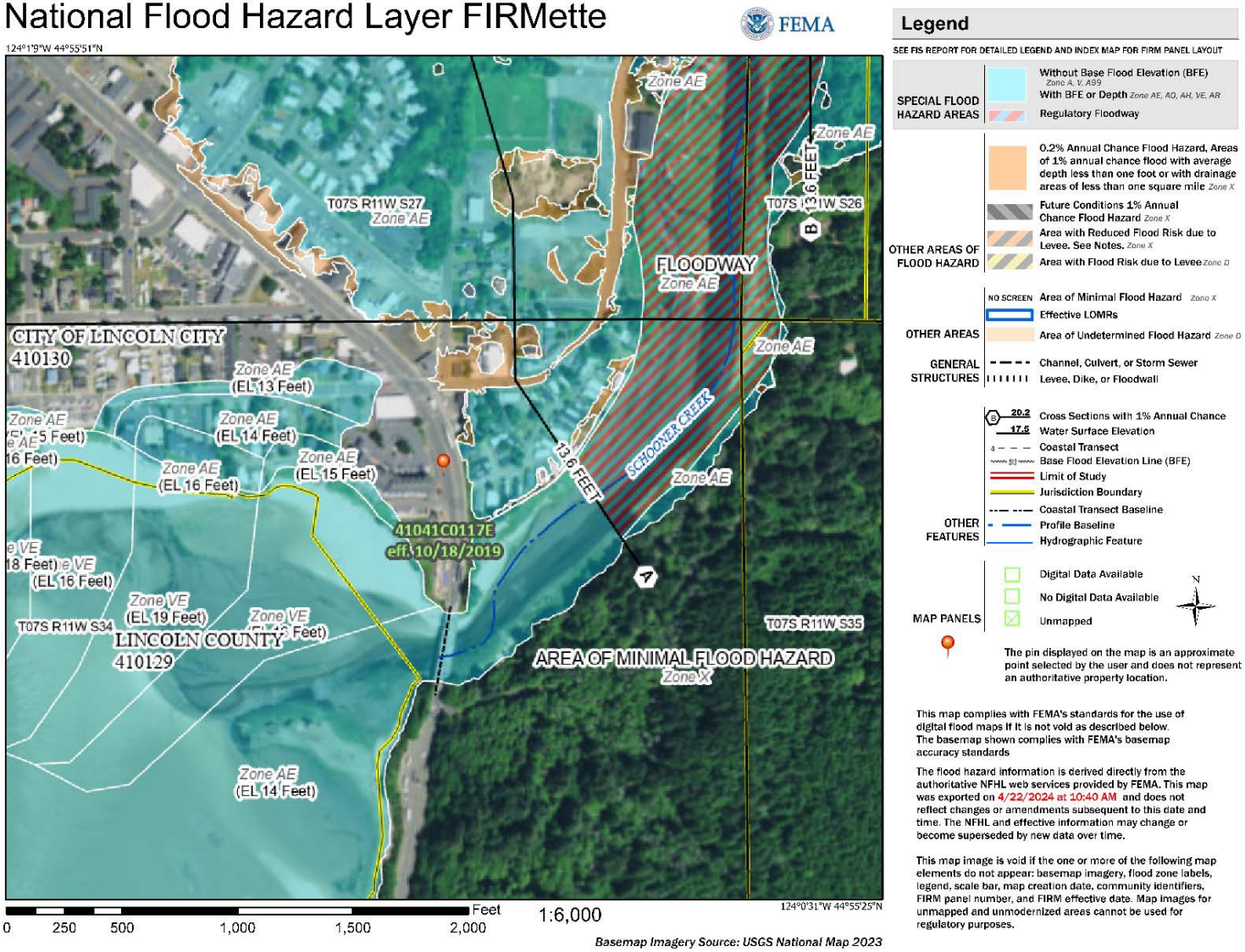

Figure 1-1. Example Flood Insurance Rate Map, Lincoln City

Areas of Minimal Flood Risk

Areas that are outside SFHAs, shaded Zone X, and Zone B areas have minimal flood risk. These areas are designated as Zone X (unshaded) or Zone C. Mandatory flood insurance purchase requirements and the minimum floodplain management standards of the NFIP do not apply in these zones.

In some cases, FEMA may determine that no significant flood hazards exist within a community; consequently, a FIRM is not necessary, and the entire community is in Zone X or Zone C. In such cases, a community may still participate in the NFIP, and federally underwritten flood insurance is available to property owners in that community. Mandatory flood insurance purchase requirements and the minimum floodplain management standards of the NFIP do not apply in these communities.

Areas of Possible, but Undetermined, Flood Hazard

FEMA may identify areas where flooding is possible or known to occur, but no assessment or analysis has been conducted to identify the flood hazards or determine the risk. These areas are designated Zone D. For example, FEMA may use Zone D in desert areas with ephemeral flooding sources or that are subject to sheet flow but that have little population or development. For areas that are entirely Zone D, FEMA does not typically prepare FIRMs. Mandatory flood insurance purchase requirements and the minimum floodplain management standards of the NFIP do not apply in Zone D.

Floodways

The FEMA-designated 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 height is typically 1 foot but may vary between NFIP participating communities.[9] Floodways are always within SFHAs but not all SFHAs have a floodway. FEMA determines floodway boundaries using detailed hydraulic analyses. Outside of the floodway, the remaining portion of the SFHA is sometimes referred to as the "flood fringe." Not all flooding sources have a designated floodway. Several factors influence the establishment of a floodway, including the physical aspects of the flooding source, the availability of detailed flood hazard analyses and other required information, available funding resources, and coordination with the community.

The establishment of a floodway impacts floodplain management requirements in the community. If FEMA identifies a floodway, the community is required to adopt the floodway and implement its floodplain management ordinance in accordance with the minimum floodplain management standards for floodways. Although FEMA does not map a floodway on every FIRM, typically FEMA will not remove a floodway from subsequent studies once it has been established.

Levees

While levee construction, maintenance, and repair are considered floodplain development and require applicable local permits, FEMA is not responsible for constructing, operating, maintaining, or

[9] Some NFIP communities may use a more restrictive designated height.

certifying levee systems. FEMA may show levees that reduce flood risk on FIRMs. However, a levee is recognized as providing protection from the 1-percent-annual-chance flood only if FEMA determines that the levee meets freeboard, structural, geotechnical, and operational requirements specified in 44 CFR 65.10. The community must provide data demonstrating that the levee meets these requirements with required certification; alternatively, a federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide the required level of protection. When FEMA receives appropriate documentation that a levee meets these requirements, FEMA accredits the levee and designates the otherwise flood-prone area that is protected by the levee as an area of moderate flood risk, shown as Zone X (shaded).

Zones AR and A99

FEMA uses these temporary zones on FIRMs to identify areas of SFHAs affected by planned levee restoration or ongoing restoration or new construction of levees.

Zone AR is used when a levee that was once accredited under 44 CFR 65.10 no longer meets accreditation requirements, and for which restoration to meet those requirements is planned (44 CFR 65.14). Mandatory flood insurance purchase requirements apply in Zone AR, and the community must apply the minimum floodplain management standards specified in 44 CFR 60.3 (f) applicable to the "dual" zone (e.g., Zone AR/AE) that FEMA designates for the area.

Zone A99 is used when a levee restoration or new construction project that is underway meets specified progress milestones (44 CFR 61.12). Mandatory flood insurance purchase requirements apply, but at Zone X rates. The community must apply minimum floodplain management standards of 44 CFR subsections 60.3 (a)(1) through (a)(4)(i) and subsections 60.3 (b)(5) through (b)(8) but is not required to apply requirements otherwise applicable in SFHAs. However, the proposed no net loss standards associated with the proposed action alternatives would apply to development in this zone.

1.3.1.3. Letters of Map Change

The FIRMs must present flood hazard information that is accurate and up to date at the time they are produced, ensuring that they provide a sound basis for floodplain management purposes. The NFIP regulations (44 CFR Parts 65 and 70) require FEMA to revise and amend FIRMs and FIS reports as warranted or in response to requests from community officials and individual property owners. The regulations (44 CFR 65.3) also require a community to notify FEMA when physical changes have occurred in the community that would result in changes to the flood hazard information presented on the FIRM.

When requesting changes to FIS reports and FIRMs, community officials and property owners must submit adequate supporting data. FEMA specifies the data requirements in the instructions for each type of letter of map change (LOMC).[10] These requirements ensure that the requester is submitting

[10] The instructions are presented in in the following application packages; for LOMAs, CLOMAs, LOMR-Fs, and CLOMR-Fs, MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill | FEMA.gov; and for CLOMRs and LOMRs, MT-2 Application Forms and Instructions | FEMA.gov.

data consistent with, and having an equivalent level of detail to, the mapping and analyses used to prepare the FIRM. These data enable FEMA to review and evaluate the requests and to ensure scientifically and technically correct flood hazard information is presented on the FIRM.

LOMC products are described in the following sections.

Letter of Map Revision

A letter of map revision (LOMR) is a revision to a FIRM that includes modifications to the BFE, SFHA, or the existing regulatory floodway. A community (or a property owner or other project proponent, with community concurrence) may request a LOMR to reflect changes to the hydrologic or hydraulic characteristics of a flood source based on physical modifications or based on an updated analysis of existing conditions. If the change affects the BFE, the community must inform FEMA of the change within 6 months after the date that information regarding the changes to flood hazard data becomes available (44 CFR 65.3).

Letter of Map Revision Based on Fill

A letter of map revision based on fill (LOMR-F) is a revision to a FIRM that establishes whether a property, portion of property as laid out by a metes and bounds description, or a structure on a property, has been removed from a SFHA based on the placement of fill. The property owner submits technical data, such as the elevation of the lowest point on the property or the lowest elevation adjacent to the structure, to demonstrate that the property or structure is at an elevation above the BFE.

Letter of Map Amendment

A letter of map amendment (LOMA) is an administrative procedure that establishes whether a property, portion of property as laid out by a metes and bounds description, or a structure on the property, is or is not located in an SFHA. Like a LOMR-F, the property owner submits technical data, such as the elevation of the lowest point on the property or the lowest elevation adjacent to the structure, to show that the property or structure is at an elevation above the BFE.

Conditional Letter of Map Changes

Because LOMRs, LOMR-Fs, and LOMAs officially amend or revise FIRMs, they must reflect existing conditions, such as an "as-built" project. However, communities, developers, and property owners may request that FEMA review and comment on proposed projects in SFHAs before any physical development occurs. In responding to these requests, FEMA comments on changes to the FIS and FIRM that would occur if the project were constructed as proposed. A conditional LOMC does not constitute a building permit or approval. The authority to approve projects and issue building permits lies with the community.

Fees are waived for projects with the primary purpose of habitat restoration that are funded in whole or in part with federal funds, state funds, or both.

1.3.1.4. Review of Documentation of ESA Compliance for Conditional Letters of Map Revision and Conditional Letters of Map Revision Based on Fill

As noted, requests for conditional letters of map revision (CLOMRs) and conditional letters of map revision based on fill (CLOMR-Fs) are submitted to FEMA prior to construction. Property owners, communities, and other project proponents and developers nationwide are subject to the ESA independent of their application for a CLOMR or CLOMR-F.

In this Draft EIS, FEMA is using the term "developer" to describe any property owner, person, or agency taking action that meets the definition of development.

In 2016, FEMA released guidance on reviewing and processing CLOMRs and CLOMR-Fs in the context of ESA compliance (FEMA 2016a). Specifically, this memorandum discusses the responsibilities for documenting ESA compliance when requesting CLOMRs and CLOMR-Fs anywhere in the U.S. FEMA now requires ESA compliance to be documented as part of all CLOMR and CLOMR-F applications before FEMA will issue a determination. FEMA will not process the CLOMR or CLOMR-F request until receiving the required documentation. Unless FEMA is directly involved with the project's funding (such as through a FEMA-managed grant program), the requester must obtain documentation of ESA compliance without FEMA's involvement. Required documentation for non-federal actions (i.e., those without federal funding or approvals) and projects involving federal actions are described below, as specified in FEMA guidance (FEMA 2016a).

Non-federal actions. For these projects, the requestor must document that:

1. No potential for "take" exists to ESA-listed species. The requestor will be responsible for the potential for take determination and the determination is not required to come from, or be concurred by, NMFS or USFWS.
2. If the requester determines a "take" will or has a potential to occur, they can consider contacting NMFS or USFWS (depending on the species) to discuss potential project revisions to eliminate the "take."
3. If neither 1 or 2 are possible and the project has the potential to "take" ESA-listed species, an Incidental Take Permit issued by NMFS or USFWS (depending on the species) may be submitted showing that the project is the subject, or is covered by the subject, of the permit.

Projects with federal actions. If federal construction, funding, or permitting is involved in a project for which a CLOMR or CLOMR-F has been requested, then the applicant may use that agency's Section 7 compliance process to document to FEMA that ESA compliance has been achieved. The ESA documentation may be through one of the following:

1. A "No Effect" determination made by, or concurred with by, the federal agency.
2. A "Not Likely to Adversely Affect" determination with concurrence from NMFS or USFWS (depending on the species).
3. A BiOp issued by NMFS or USFWS (depending on the species).

4. A copy of a federally issued permit with justification that the proposed development for which a CLOMR or CLOMR-F is sought is covered by the permit.

1.3.1.5. Letters of Determination Review

A property owner may request a Letter of Determination Review (LODR) to appeal a lender's flood zone determination. A lender and borrower can jointly make a request to FEMA within 45 days of the notice to the borrower by the lender that the building is within the SFHA. The LODR process enables FEMA to verify whether the building's location was correctly identified on the FIRM. A successful LODR releases the lender from the statutory obligation to require the purchase of flood insurance; however, the lender retains the prerogative to require flood insurance absent of the federal requirement.

1.3.2. FLOODPLAIN MANAGEMENT

As discussed in Section 1.1.4, the NFIP was established through the NFIA and provides for a unified program for floodplain management. As discussed in Section 1.2, FEMA has no direct involvement in the administration of local floodplain management ordinances. The NFIP operates as a federal-state-local partnership that depends on state statutes and regulations authorizing local governments to regulate floodplain development under the state's enforcement powers to protect the health, safety, and general welfare of its residents.

FEMA's role under the NFIP is limited to enrolling communities in the NFIP; setting the minimum floodplain management standards; providing technical assistance to ensure that communities are complying with the NFIP program requirements; providing programmatic monitoring, oversight, and enforcement including through the Community Assistance Contact (CAC) process and Community Assistance Visits (CAV); and working with communities to address issues of programmatic non-compliance. Although FEMA provides funds for disaster recovery and mitigation, which can include construction within the SFHA, the agency does not issue permits for development or make land use decisions related to development.

1.3.2.1. Enrolling Communities In the NFIP

States have a role in the NFIP, and many have established floodplain management programs. Each state has designated an NFIP State Coordinating Agency as a point of contact for the NFIP. Generally, the State Coordinating Agency is the state environmental agency, state natural resources agency, or the state emergency management agency. For Oregon, DLCD is the NFIP State Coordinating Agency.

Many states have adopted floodplain management statutes and regulations and have established and funded their own floodplain management programs. States must have floodplain management regulations or executive orders in place that meet the minimum requirements of the NFIP for state-owned properties in SFHAs.

FEMA has established processes to enroll communities in the NFIP and to ensure that eligible communities continue to meet program requirements (see Section 1.3.2.3 for information on compliance and enforcement). The NFIP provides flood insurance coverage only in states and

communities that adopt and enforce floodplain management standards that meet the minimum requirements established by regulation. Communities must apply to participate, and the application package must include the application, a resolution of intent to participate and cooperate with FEMA, and evidence of the adoption of floodplain management regulations that meet the minimum standards of the NFIP.

1.3.2.2. Administering the Map Adoption Process

Each time FEMA provides a community with a new, updated, or revised FIRM, that community must ensure their floodplain management regulations are compliant with the level of study provided on the maps and adopt the updated FIRMs. This may mean a community must amend their regulations to incorporate the new data and adopt the new FIRMs. The community has 6 months to incorporate the new data or the community will be suspended from the NFIP (44 CFR 59.24(a) and 60.13).

1.3.2.3. Minimum Floodplain Management Standards

To participate in the NFIP, a community must adopt and enforce floodplain management regulations that meet the NFIP minimum floodplain management standards codified in 44 CFR Part 59 and 44 CFR Part 60. All development within the SFHA must comply with applicable standards. The intent of these standards is to reduce flood risk and loss of life and property. The minimum actions that must be taken by a community to become eligible and to remain eligible for participating in the NFIP are detailed in 44 CFR 59.1 Subpart B et seq., and include the following elements:

1. Require permits for all floodplain development, defined as any human-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, drilling operations, or storage of equipment and materials within the SFHA (44 CFR 60.3(a)(1)).
2. Review all proposed developments to assure that all necessary permits have been received from those governmental agencies from which approval is required by federal and state law, such as Section 404 of the Clean Water Act (CWA) of 1972 and the Oregon Fill-Removal Law (Section 1.4.2) (44 CFR 60.3(a)(2)).
3. Review building permit applications for new construction and substantial improvements within the floodplain, and ensure that specific measures (e.g., elevation, anchoring, flood-proofing, installation of flood vents, breakaway walls) are taken to avoid or reduce flood damage (44 CFR 60.3(a)(3)).
4. Review all permit applications to determine whether proposed building sites will be reasonably safe from flooding (44 CFR 60.3(a)(3)).
5. Review subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, to determine whether such proposals will be reasonably safe from flooding (44 CFR 60.3(a)(4)).
6. Require within flood-prone areas new and replacement water supply systems to be designed to minimize or eliminate infiltration of flood waters into the systems (44 CFR 60.3(a)(5)).

7. Require within flood-prone areas i) new and replacement sanitary sewage systems to be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters and ii) on-site waste disposal systems to be located to avoid impairment to them or contamination from them during flooding (44 CFR 60.3(a)(6)).
8. Obtain Elevation and Flood-proofing Certifications for new development and substantial improvements to existing developments.
9. Ensure that encroachments into the floodway portion of the SFHA are prohibited if they cause any increase in flood levels (44 CFR 60.3(d)(3)).
10. Maintain permit records and related materials and ensure that these documents are available for public, state, and FEMA inspection (44 CFR 59.22(a)(9)).

Communities must incorporate the floodplain management standards into their zoning codes, subdivision ordinances, and building codes, or they may adopt special purpose floodplain management ordinances. The floodplain management standards apply to areas mapped as SFHAs. NFIP Participating communities must apply the minimum floodplain management standards to all new development in the SFHA, as well as to existing buildings and infrastructure in the SFHA that have been substantially damaged or substantially improved, as determined by the community. Additionally, communities are allowed—and encouraged—to adopt floodplain management regulations that are more restrictive than the minimum standards. Once a community adopts a higher standard than the minimum standard, the higher standard takes precedence and must be enforced (44 CFR 60.1(d)).

1.3.2.4. Community Rating System

The CRS is a voluntary program within the NFIP that recognizes and encourages community floodplain management practices that exceed the minimum management standards. For this program, FEMA has established 19 creditable activities, organized into four categories: public information, mapping and regulations, flood damage reduction, and warning and response. NFIP participating communities receive reductions in insurance premiums, ranging from 5 to 45 percent, based on the activities a community chooses to implement. Of the 260 NFIP communities in Oregon, 35 participated in the CRS as of December 2023.

1.3.2.5. FEMA's Conservation Action Program

As discussed in Section 1.1.2, under Section 7(a)(1), federal agencies, including FEMA, are required to utilize their authorities to carry out programs for the conservation of ESA-listed species. FEMA's Conservation Action Program (established in 2020) is a three-pronged approach that leverages existing programs to promote conservation of ESA-listed species, their habitat, and designated critical habitat. The program focuses on 1) building awareness through web-based content, 2) helping with identification of listed species with FEMA's Flood Risk and Endangered Species Habitat Mapping Tool, and 3) leveraging the CRS to encourage protection of ESA-listed species. As part of the Conservation Action Program, FEMA identified CRS credit opportunities to incentivize the conservation of ESA-listed species including developing floodplain species assessments and floodplain species plans.

1.3.2.6. Compliance and Enforcement

FEMA has an established compliance and enforcement strategy and monitors communities for compliance with the minimum floodplain management standards contained in federal regulations (44 CFR Part 59 through 60), as adopted by the community to participate in the NFIP. Higher standards beyond these minimum regulations are encouraged and FEMA developed the CRS program to incentivize such local actions. Once a community adopts a higher regulatory standard than the minimum floodplain management standard, the higher standard takes precedence (44 CFR 60.1(d)). FEMA is authorized to carry out investigations with respect to the adequacy of state and local measures in flood prone areas as to land management and use, flood control, flood zoning, and flood damage prevention within NFIP participating communities; and works closely with local governments to provide technical assistance and to encourage the application of such criteria and the adoption and enforcement of such measures (42 USC 4102).

Under its community technical assistance process, FEMA coordinates with NFIP participating communities to obtain additional information and documentation related to compliance with the NFIP through the CAC process. This method of engagement normally consists of one to multiple meetings between a FEMA official and the community's floodplain management staff to determine whether the community is effectively implementing its responsibilities for participation in the NFIP, and to offer assistance as needed. The contact is intended to establish or re-establish communications with a community to evaluate performance or identify areas where additional technical assistance is needed.

If further in-depth investigation is warranted, FEMA may elevate the level of coordination to a CAV to provide additional support. A CAV is typically scheduled as an in person visit and a formal audit of the community's NFIP implementation. The primary goal of a CAV is to perform a comprehensive review of the community's NFIP implementation and determine whether the community is in good standing and may remain eligible to participate in the NFIP. These visits include field tours of the jurisdiction's regulatory floodplain and identification of potential violations in the field or programmatically within the office. When potential violations are identified, FEMA will request the community to research or address and enforce its land use authority to remedy potential violations to the maximum extent practical. Closure of a CAV may require several months or more to complete, due to the due process required to pursue legal action within the community's judicial system. The community is required to implement its police powers and may exhaust its administrative and legal authorities in an effort to correct the potential violation. Generally, this process results in resolution of the potential violation to the NFIP's minimum standards or to the maximum extent possible (as defined by the NFIP). If the community has exhausted its legal authority and is unable to resolve the potential violation, the community or state may request a 1316 for the property. The 1316 process allows for the community to retain its standing in the NFIP, despite the failure to resolve the violation to the maximum extent practical as described below. The CAC and CAV processes are explained in detail in FEMA's *Guidance for Conducting Community Assistance Contacts and Community Assistance Visits* (FEMA 2011).

FEMA and DLCD coordinate a predetermined set of audits on an annual schedule. FEMA is the lead for contacts with Tribal governments that are enrolled in the NFIP, consistent with federal policy regarding government-to-government communications. NFIP participating communities are required to assure that all necessary permits have been received from those governmental agencies from which approval is required by federal and state law for all development in the SFHA.

Through the audit processes, FEMA, and DLCD on FEMA's behalf, work with the communities to resolve potential violations using a progressive approach to enforcement. FEMA will provide technical assistance and help the community gain compliant regulations, permitting procedures, or conduct discussions with property owners.

Should FEMA find a culture of non-compliance with the provisions of the NFIP or where a community may be unwilling to pursue enforcement of their obligations under the NFIP, FEMA may move forward with placing the community on probation and eventually may suspend the community from participating in the NFIP. Through its probation procedures, the FEMA Regional Administrator may determine a timeline for addressing the potential violation(s) and request a $50 surcharge be applied on all flood insurance policyholders within the community (44 CFR 59.24). Probation generally results in a remediation plan for the community to follow in order to return to good standing and may last a year or more. The remediation plan includes an outreach campaign informing residents of the reason for the surcharge. When the community fails to meet the requirements of the remediation plan, as determined by the FEMA Regional Administrator, the Regional Administrator may recommend suspension of the community from the NFIP to FEMA Headquarters. Suspension results in a community not being eligible for the sale of flood insurance through the NFIP and thus making it difficult for property owners to meet the mandatory purchase requirements for loans made for properties in the SFHA. In addition, suspension also means a community is no longer eligible for most forms of disaster assistance in the SFHA including FEMA grants for Individual Assistance, Public Assistance (PA), and Hazard Mitigation Assistance (HMA), as well federally backed loans such as those from the Small Business Administration and Veterans Administration. Probation and suspension can often be avoided if a community is willing to work with FEMA to improve its local floodplain management practices, related regulations, and ensure violations are remediated to the maximum extent practicable (FEMA 2016b).

1.3.2.7. Training and Technical Assistance

FEMA's compliance approach focuses on encouraging and promoting compliance, rather than threatening to penalize communities for non-compliance. FEMA has dedicated staff at every regional office and headquarters to support local floodplain management efforts. FEMA provides training and technical assistance to help a community achieve compliant status. FEMA gives training both to the community floodplain managers who must administer the local floodplain ordinances and to FEMA floodplain management staff. Training is offered through FEMA's national training center, the Emergency Management Institute, local training events, conferences, workshops, webinars, home study courses, and guidance. Additionally, the CRS provides incentives to communities undertaking such training. FEMA also encourages its floodplain management staff and community partners to become certified floodplain managers through the Certified Floodplain Management program offered

by the Association of State Floodplain Managers. This program, which was developed with input from FEMA staff, is a formalized procedure allowing individuals to demonstrate that they have a standardized level of knowledge and skills in floodplain management and a commitment to continuing education in floodplain management.

1.3.2.8. Section 1316 Process: Removal of Insurance Eligibility

Pursuant to Section 1316 of the NFIA, FEMA may deny flood insurance coverage for any property in the SFHA that has been declared by an established state or local zoning authority, or other authorized public body, to be in violation of state or local floodplain management regulations (42 USC 4023; 44 CFR 73.1). FEMA can only take a Section 1316 action upon request by the state or community; FEMA may not initiate such an action. This removal of insurance eligibility can act as a local enforcement action within the community to encourage a non-compliant property within the community to rectify floodplain management issues.

1.3.3. FLOOD INSURANCE

With the passage of the NFIA, Congress mandated that the federal government implement a program that "will enable interested persons to purchase insurance against loss resulting from physical damage to or loss of real property or personal property related thereto arising from any flood occurring in the United States" (42 USC 4011(a)). The statute requires FEMA to "make flood insurance available" in communities that have evidenced interest in securing flood insurance through the NFIP and adopted adequate floodplain management regulations consistent with criteria developed by FEMA. See 42 USC 4012(c), 4022(a); see also, 44 CFR 60.1(a). Additional information on flood insurance through the NFIP is provided in Appendix B.

The NFIP provides insurance coverage for residential properties, personal property, and non-residential property. Insurance premiums are based on the risk rating of the building to be insured, the higher the risk, the higher the flood insurance premium. FEMA uses the Risk Rating 2.0 approach to risk assessment, which considers factors such as the frequency of flooding, types of flooding, proximity to flood sources, and building characteristics such as the height of the first floor and cost to rebuild (FEMA 2022a).

1.4. Other Federal, State, and Local Requirements for Floodplain Development

In addition to the minimum NFIP requirements codified in 44 CFR Part 59 and 44 CFR Part 60, developers may be subject to additional requirements for development in the SFHA. Such requirements may be associated with 1) federal, state, and local regulations, 2) site-specific permits, authorizations, and approvals, and 3) existing additional ESA requirements. As discussed in Section 1.3.2.3, the minimum floodplain management standards require that all necessary permits have been received from those governmental agencies from which approval is required by federal and state law (44 CFR 60.3(a)(2)).

Before a property owner can undertake any development in the SFHA in an NFIP participating community, they must obtain a permit from all applicable regulatory entities. The project proponent, typically the property owner or the developer, applies directly to the regulatory entities that have authority for approval. Depending on the type of development, location of development within Oregon, or existing conditions on-site, other environmental permits, authorizations, and approvals may be required at the federal, state, and local levels.

1.4.1. FEDERAL REGULATIONS

Depending on the type of development, location of development within Oregon, or existing conditions on-site, other federal regulations not associated with the NFIP may apply. Such regulations may require environmental reviews, permits, authorizations, and approvals at the federal level. For example, when a development in the SFHA is also within a federally regulated waterbody, such as a wetland or a stream, CWA regulations and associated permit requirements apply. The U.S. Army Corps of Engineers (USACE) issues permits under Section 404 of the CWA. States administer Section 402 of the CWA through National Pollutant Discharge Elimination System permits including Municipal Separate Storm Sewer System (MS4) permits. Similarly, if the development affects a navigable river, the Rivers and Harbors Act regulations and associated permit requirements may apply. FEMA and the NFIP have no influence over the review or authorization of these other agency regulatory processes or approvals. 44 CFR 60.3(a)(2) is a coordination provision, reminding the local floodplain administrator that other regulatory provisions may also apply while the community conducts its evaluation process for the proposed non-federal development.

Federal regulations (and associated permits, authorizations, and approvals) may require additional measures for a development in the SFHA. For example, Section 404 CWA permits for work occurring in a wetland or stream require applicants to avoid and minimize impacts on waters of the U.S. Compensatory mitigation is required for all impacts that cannot be avoided or minimized. According to CWA regulations, compensatory mitigation means the restoration, establishment (creation), enhancement, or preservation of wetlands, streams, and other aquatic resources. MS4 permits, administered by states under the federal CWA Section 402, require applicants to mitigate for water quality impacts associated with sewer discharges and storm water discharges from developments, construction sites, or other areas of soil disturbance into waters of the U.S.

If a federal agency takes an action associated with a development in the SFHA, either by issuing a federal permit, by providing funding, or implementing a project, the federal agency must ensure the project complies with federal environmental laws, regulations, and executive orders, including the ESA. A state agency such as the Oregon Department of Transportation (ODOT) may receive federal funding for a project in the SFHA from the Federal Highway Administration. A private developer may similarly receive federal funding, such as housing developers that receive grants through the U.S. Department of Housing and Urban Development (HUD). In any of these cases, the issuance of a federal permit or use of federal funding requires compliance with federal environmental laws, regulations, and executive orders including project-specific ESA compliance.

Under Section 7(a)(2) of the ESA, federal agencies must ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any ESA-listed species or result in the destruction or adverse modification of designated critical habitat (16 USC 1536(a)–(d)). A federal agency may i) make a no effect determination, ii) determine that the proposed project has a beneficial effect or a *de minimis* impact (insignificant and discountable) on ESA-listed species and seek concurrence from NMFS or USFWS through informal consultation, or iii) if the project is likely to adversely affect ESA-listed species or designated critical habitat, the federal agency shall initiate formal consultation with NMFS, USFWS, or both. A formal consultation would be concluded with ESA compliance secured through a federal agency's programmatic consultation and BiOp or through a project-specific consultation and BiOp. This formal process may result in the requirement for the project proponent to implement conditions, measures, or reasonable and prudent alternatives (RPAs).

Under the NFIP, FEMA does not fund, authorize, or otherwise approve individual construction or development actions within the SFHA. However, under the Stafford Act (42 USC 5121-5207) after a disaster declaration, FEMA annually funds thousands of PA and Hazard Mitigation grants to local communities via the states and Tribes. Therefore, FEMA executes its ESA Section 7(a)(2) responsibilities for each one of these funding decisions using one of the three options described in the paragraph above. Completion of any of these processes meets FEMA's ESA Section 7 compliance obligations for Stafford Act funding actions. Similarly, other federal agencies execute their ESA Section 7(a)(2) responsibilities for their actions (i.e., funding decisions, permit approvals, or project implementation) and receive project-specific ESA compliance documentation. Examples of measures applied to projects based on federal agencies executing their ESA Section 7(a)(2) responsibilities include implementing revegetation plans for work occurring along stream banks, relocating fish to avoid take during construction activities, or using measures to avoid erosion and associated water quality impacts.

Under Section 9 of the ESA, it is unlawful for any person (including, but not limited to, actions by federal agencies) to take endangered species; Section 4(d) extends these prohibitions for threatened species (see Section 1.1.2). To reduce the risk of an ESA Section 9 violation, communities, developers, and individuals have the option of developing an HCP and applying for a Section 10(a)(1)(B) Incidental Take Permit through NMFS, USFWS, or both. These plans are designed to offset harmful effects that an activity might have on ESA-listed species and the associated permit may require additional conservation measures or mitigation. For example, the Western Oregon State Forests HCP is being developed by the Oregon Department of Forestry (ODF). The HCP identifies a conservation strategy to avoid take of ESA-listed species associated with ODF activities (e.g., timber harvest, stand management, habitat restoration, and construction and maintenance of recreation facilities). The associated conservation strategy includes measures such as prohibiting forest management in riparian conservation areas and identifying operational and design standards for roads, equipment use and the timing of activities to minimize effects on species and streams. Other examples of HCPs include the Western Placer County HCP and Natural Community Conservation Plan, the Benton County Prairie Species HCP, the Port Blakely HCP for the John Franklin Eddy Forestlands, and the City of Santa Cruz Anadromous Salmonid HCP (Placer County 2020, Benton

County 2010, Clackamas County 2023, City of Santa Cruz 2023). Appendix A provides additional information on HCPs.

NMFS and USFWS may also authorize Section 4(d) limits, which limit the application of Section 9 violations of selected activities for threatened species. Agencies and property owners can seek inclusion in the Section 4(d) limits to reduce their liability by obtaining a Section 4(d) limit authorization. For example, ODOT has worked with NMFS to authorize a Section 4(d) limit for activities associated with ODOT's Routine Road Maintenance Program. The Routine Road Maintenance Water Quality and Habitat Guide established best management practices (BMPs) to ensure that activities under the Routine Road Maintenance Program are within the NMFS Section 4(d) limit and thus exempt from Section 9 violations. Examples of the BMPs established in the guide include minimizing discharges to receiving streams and wetlands, planting vegetation on eroding banks, and re-seeding drainage ditches and steep slopes as appropriate (ODOT 2020).

Project-specific measures associated with federal permits, authorizations, and approvals including Section 7 ESA compliance, Section 10 HCPs, and Section 4(d) limits would provide conservation measures beyond the scope of the NFIP and above the minimum NFIP standards.

1.4.2. STATE AND LOCAL REGULATIONS

Oregon state regulations may require additional mitigation or conservation measures in addition to the NFIP minimum floodplain management standards. For example, Oregon's Removal-Fill Law (ORS 196.795-990) applies to all landowners and requires mitigation for activities involving the placement or removal of 50 cubic yards of material or more in a wetland or waterway, including isolated wetlands not regulated under Section 404 of the CWA. For activities in state-designated Essential Salmonid Habitat, State Scenic Waterways, and compensatory mitigation sites, mitigation is required for any amount of material placed or removed. Mitigation under the Removal-Fill Law may include enhancing, creating, or restoring a wetland, waterway, or both on- or off-site.

Many Oregon communities have more rigorous standards for SFHA development than the NFIP minimum standards, but they may not be part of the CRS program. For example, Scappoose City prohibits the use of fill in the floodway unless the net effect of excavation and fill constitutes no increase in fill volume (Code, Chapter 17.84.170(A)(B)). Lane County requires feasibility studies ensuring that habitat is enhanced or restored for projects located in the regulatory floodway (Lane County 2024). Many Oregon communities require more freeboard (i.e., the lowest floor of a structure is elevated higher than the BFE) than the minimum standards. DLCD's model ordinance for development in the SFHA recommends one foot of freeboard; Curry County requires that all residential, commercial, and industrial buildings be elevated so that the lowest floor is two feet above the BFE (Floodplain Ordinance 98-1, Section 9.2-5).

Project-specific measures associated with state regulations may result in floodplain conservation above the minimum NFIP standards. However, failure to implement such measures can result in NFIP violations (Section 1.3.2.4) based on the minimum NFIP standard (44 CFR 60.3(a)(2)) that requires NFIP participating communities to assure that all necessary permits have been received

from those governmental agencies from which approval is required by federal and state law. Once a community adopts a higher regulatory standard than the NFIP's minimum floodplain management standard, the higher standard takes precedence (44 CFR 60.1(d)).

1.5. Endangered Species Act Consultations

As a federal agency, FEMA must consider whether its activities, programs, and regulations affect ESA-listed species, as described in Section 1.1.2.

On April 4, 2016, NMFS completed their analysis of the effects of the NFIP on species listed as threatened or endangered under the ESA and essential fish habitat under the MSA in Oregon and issued a BiOp (NMFS 2016a). The 2016 NMFS BiOp concluded that the current implementation of the NFIP in the Oregon plan area is:

> "likely to jeopardize the continued existence of 16 ESA-listed anadromous fish species and Southern Resident killer whales, and it will result in the destruction or adverse modification of designated or proposed critical habitat for the 16 anadromous fish species."

NMFS also concluded that the current implementation of the NFIP in the Oregon plan area:

> "will have adverse effects on EFH designated for Pacific Coast salmon in freshwater where development will occur. Pacific salmon, coastal pelagic species, highly migratory species, and groundfish will also be adversely affected in nearshore areas and estuaries, including estuarine and seagrass areas designated as [habitat areas of particular concern] HAPCs in the Lower Columbia River and at other river mouths, bays, estuaries, and coastal waters where [floodplain development] projects will occur."

Jeopardy is defined as reducing a species' numbers, reproduction, or distribution so that the likelihood of survival and recovery in the wild is appreciably reduced. NMFS developed an RPA outlining recommended changes to the NFIP that would allow FEMA to continue implementing the NFIP without jeopardizing the continued survival of ESA-listed species, resulting in the destruction or adverse modification of designated critical habitat, and adversely affecting EFH in the Oregon plan area. The RPA within the BiOp proposed alternative approaches to NFIP floodplain management standards that included the six elements in **Table 1.1**.

Table 1.1. Reasonable and Prudent Alternative Elements in the NMFS BiOp

RPA Element	NMFS Recommended that FEMA:
1: Notice, Education, and Outreach	Notify NFIP participating communities about the outcome of FEMA's consultation and develop an education and outreach strategy for RPA implementation.
2: Interim Measures	Require or recommend immediate implementation of measures that would reduce the loss of floodplain habitat features and functions while working to phase in the long-term measures in RPA elements 3 through 6.

RPA Element	NMFS Recommended that FEMA:
3: Mapping Flood and Flood-Related Hazard Areas	Implement specific program criteria to better identify and map flood and flood-related erosion hazard areas.
4: Floodplain Management Standards	Revise FEMA's regulatory floodplain management standards to avoid, minimize, and mitigate the adverse effects of floodplain development on remaining floodplain functions and processes.
5: Data Collection and Reporting	Collect and report floodplain development information for all NFIP participating communities.
6: Compliance and Enforcement	Ensure that NFIP participating communities comply with revised floodplain management standards.

FEMA has coordinated with USFWS regarding future consultation on the NFIP in the Oregon plan area.

1.6. Oregon NFIP-ESA Integration

This section describes FEMA's review of the 2016 NMFS BiOp RPA and process to develop the requirements for integration of ESA and MSA considerations into the implementation of the NFIP in the Oregon plan area (no net loss standards).

"No net loss standards" is an umbrella term that includes offsetting impacts on the three floodplain functions, RBZ requirements, (Section 3.3.1 of this Draft EIS) as well as reporting requirements (Section 3.3.5 of this Draft EIS).

1.6.1. NFIP-ESA INTEGRATION AUTHORITY

As explained throughout this document, there are limitations on what FEMA may lawfully prescribe as part of the minimum floodplain management standards.

Under 44 CFR 60.3(a)(2), a community must ensure that all other federal, state and local permits have been obtained when permitting a project in the SFHA. As such, a local community must ensure that an "incidental take permit" under Section 10 of the ESA is not required. The NMFS BiOp on the implementation of the NFIP in Oregon has determined that development in the floodplain affects the three key floodplain functions (flood storage, water quality, and vegetation), causing take. Therefore, a community must ensure that any development in the floodplain that impacts one or more of the three floodplain functions must mitigate to achieve no net loss. A community has the option of seeking their own take coverage for a project through another federal nexus or they may choose to develop a Habitat Conservation Plan (HCP) for their floodplain development program under Section 10 of the ESA and obtain their own incidental take permit.

Because the Section 9 prohibition on take applies to local communities and FEMA alike and because ESA Section 7 separately imposes an affirmative duty on federal agencies engaged in any action authorized, funded, or carried out by the agency to ensure that the action is not likely to jeopardize the continued existence of ESA-listed species, FEMA has integrated into its existing performance

standards the no net loss standards for the Oregon plan area that, if adhered to, would allow communities to demonstrate compliance with Section 9.

The no net loss standards were developed by FEMA pursuant to its Section 7 obligations and follow the terms of the RPA issued with NMFS' 2016 BiOp on the implementation of the NFIP in the Oregon plan area. A community participating in the NFIP may therefore satisfy its 44 CFR 60.3(a)(2) obligation as it relates to ESA Section 9 by implementing the NFIP-ESA integration no net loss standards outlined by FEMA and the RPA. A community participating in the NFIP would have multiple and flexible options to achieving the no net loss standards as described further in Section 3.3.2.

1.6.2. DRAFT OREGON IMPLEMENTATION PLAN FOR NFIP-ESA INTEGRATION

The RPA outlines one approach that FEMA could implement to avoid jeopardy to ESA-listed species and their habitat. FEMA reviewed the components of the RPA while considering its existing statutory authority and feasibility for NFIP participating community implementation. FEMA determined the best approach to meeting the intent of the RPA was to identify actions the agency could take to ensure its implementation of the NFIP in the Oregon plan area is consistent with the RPA and compliant with the ESA going forward (i.e., the no net loss standards).

FEMA convened an interagency team of staff from FEMA and DLCD, with support and input from NMFS and interested stakeholders to identify an approach to begin implementation of the elements of the RPA (described in Appendix G of the 2021 Draft Implementation Plan). This effort informed FEMA's development of the 2021 Draft Implementation Plan (FEMA 2021). FEMA continued to work with cooperating agencies and Oregon stakeholders to refine the 2021 Draft Implementation Plan through outreach and engagement efforts, including those associated with the scoping period for this EIS, see Chapter 5. Input received through continued engagement efforts identified the need for clarification of the no net loss standards and provision for adequate flexibility for NFIP participating community implementation. These efforts led to a revised 2024 Draft Implementation Plan, see Appendix A, that is available for broader review and comment with this EIS.

The no net loss standards identified in the 2024 Draft Implementation Plan are the result of the interagency team's expertise, discussions, and feedback from the cooperating agencies and Oregon stakeholders that have a role or interest in implementing the NFIP. FEMA considered the input provided by these stakeholders in the development of the 2024 Draft Implementation Plan. FEMA will continue to consider input on the 2024 Draft Implementation Plan through engagement efforts with cooperating agencies and the public review and comment period of this EIS, see Chapter 5. This iterative process of developing the implementation plan reflects the efforts of FEMA to establish no net loss standards that avoid continued jeopardy to listed species and address the needs and concerns of Oregon communities.

1.7. Oregon Plan Area

The Oregon plan area boundary is generally defined by the boundaries of six NMFS Salmon and Steelhead Recovery Domains within the State of Oregon: Oregon Coast, Southern Oregon/Northern

California Coast, Willamette River, Lower Columbia River, Middle Columbia River, and Snake River.[11] The Oregon plan area boundary generally follows hydrologic unit code 10 watershed boundaries, which are defined by hydrologic and topographic features, and generally encompasses those watersheds that drain to the Columbia River or the Pacific coast of Oregon. **Figure 1-2** depicts the Oregon plan area boundary.[12]

All Oregon counties are fully or partially within the boundaries of the plan area, with the exception of Baker, Harney, Klamath, Lake, and Malheur Counties. The federal government is not an NFIP participating community and therefore federal land is not included in the Oregon plan area. For additional detail on the plan area, including why areas were included or excluded, see Appendix B.

The proposed action and associated alternatives described in Chapter 3 would apply to communities that meet three criteria: 1) are in the Oregon plan area, 2) have mapped SFHA within the community, and 3) are participating in the NFIP. For counties or communities partially located within the plan area (e.g., Grant County), the proposed action and the alternatives considered would apply only to areas that meet all three criteria. For instructions on determining if a community or property of interest meet these criteria, see Appendix C.

The proposed action and alternatives considered would apply to all communities that meet all three conditions. If those conditions change in the future, then the applicability of the alternatives would also change at that time. For example, best available data on flood risk may add to or alter the mapped SFHA in the future, a community may join or leave the NFIP, or the SFHA may change as a result of a LOMR. Proposed changes to the implementation of the NFIP in the Oregon plan area would also apply to the newly mapped SFHA in participating communities or those that choose to join the NFIP. If a future map revision results in a community no longer being in the SFHA or a community chooses to leave the NFIP, then changes to the implementation of the NFIP in the Oregon plan area would no longer apply to those communities.

[11] NMFS has mapped these Recovery Domains at https://www.webapps.nwfsc.noaa.gov/portal/home/webmap/viewer.html.

[12] The Oregon plan area boundary includes portions of Baker, Harney, Klamath, Lake, and Malheur Counties. However, these counties do not have SFHA within the Oregon plan area boundary, the SFHA is federal land and therefore not under the jurisdiction of the county, or both.

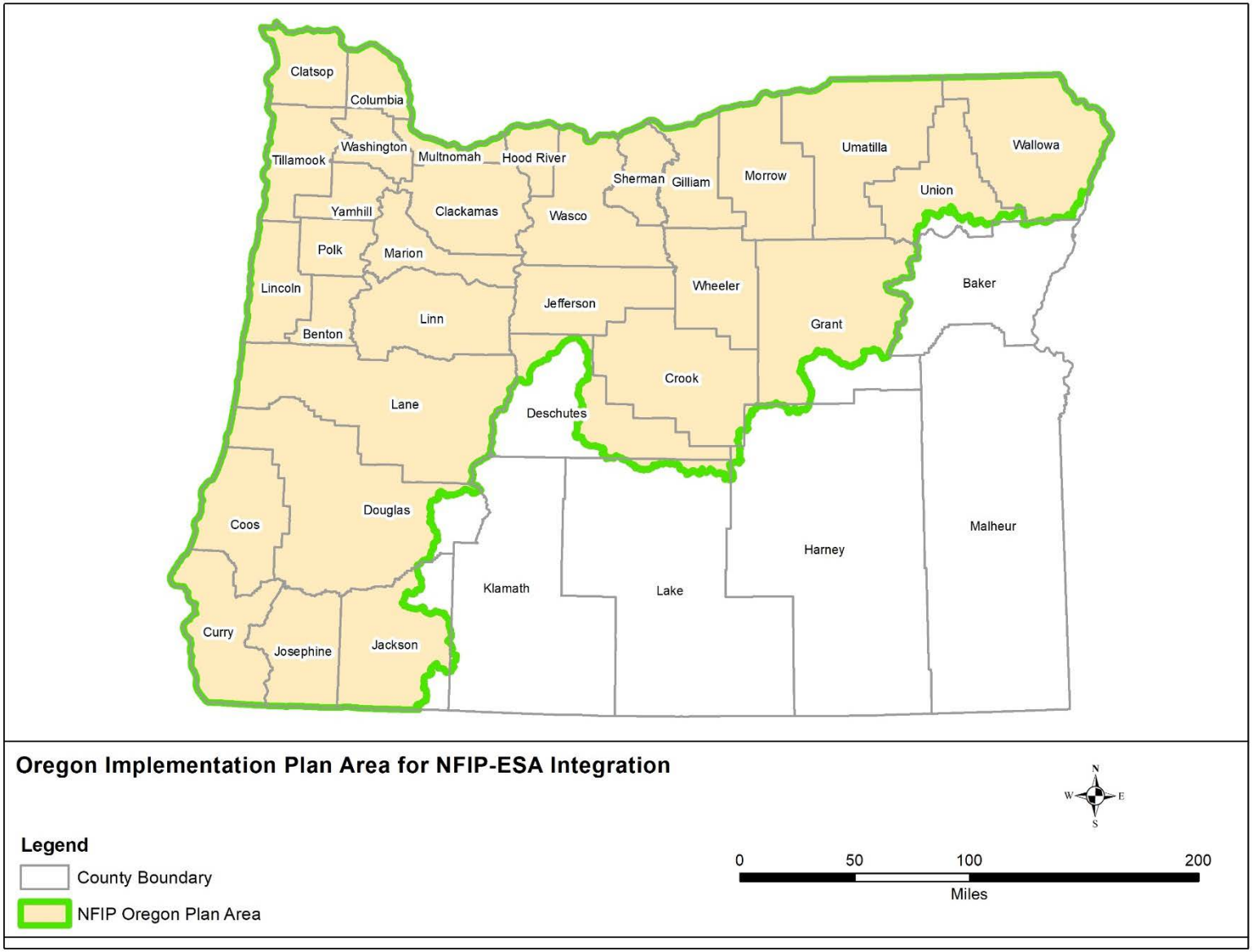

Figure 1-2. Oregon Plan Area Boundary

Table 1.2 shows that the Oregon plan area encompasses approximately 59 percent of the land in Oregon and approximately 93 percent of the state population. The SFHA within the Oregon plan area (where the proposed action and alternatives would apply) encompasses approximately 2 percent of land in the state and less than 5 percent of the population.

Table 1.2. Area and Population of Oregon, the Oregon Plan Area, and Special Flood Hazard Area

Geography	Area			Population		
	Total Acres	Percent of Oregon Plan Area	Percent of Oregon State	Total Population	Percent of Oregon Plan Area [2]	Percent of Oregon State
Oregon State	62,127,992	N/A	100%	4,233,358	N/A	100%
Oregon Plan Area	36,557,840	100%	58.8%	3,943,788 [1]	100%	93.2%
SFHA in Oregon Plan Area [3]	1,191,641	3.3%	1.9%	191,083	4.7%	4.5%

Source: FEMA National Flood Hazard Layer, U.S. Census Bureau 2022a, U.S. Census Bureau 2022b
Notes:
1. Population of NFIP participating communities in the Oregon plan area
2. Percent of NFIP participating communities' population in the Oregon plan area
3. Does not include flood Zone D

1.8. Population, Economic, and Development Trends

Population, economic, and development trends provide a high-level understanding of the existing conditions in Oregon and how conditions may be anticipated to change in the future. This information serves as background that informs the determination of impacts associated with each alternative in Chapter 4. Relevant trends will be expanded upon in Chapter 4 as applicable. Appendix M contains community specific data.

1.8.1. POPULATION TRENDS

In 2022, the population estimate for Oregon was approximately 4.2 million people (U.S. Census Bureau 2022a). The Oregon plan area encompasses over 90 percent of Oregon's population, from urbanized Portland to sparsely populated rural communities (U.S. Census Bureau 2022b). The population of the Oregon plan area was almost 4 million in 2020, having grown by 1 percent annually since 2010 (U.S. Census Bureau 2010, U.S. Census Bureau 2020). The total Oregon plan area population is projected to increase by almost 1 million people by 2045, an increase of about 0.9 percent per year between 2020 and 2045 (Portland State University 2023). Population levels in Oregon plan area counties vary from more than 815,000 people in Multnomah County to 1,450 persons in Wheeler County. Projected growth also varies widely among counties; many are anticipating stable levels, while others expect more rapid growth. Population growth is reflected in the demand for housing and thus construction, some of which may be expected to occur in the SFHA.

1.8.2. ECONOMIC TRENDS

The Oregon economy has been growing at an annualized rate of 2.2 percent from 2017 to 2022, reaching a gross state product of $229.5 billion in 2022 (IBISWorld 2023). Employment has also been growing (2.3 percent from 2017 to 2022) with over 2 million people employed in 2022; however, this is a lower growth rate than the total U.S. at 3.7 percent (IBISWorld 2023). The three industries in Oregon with the highest gross domestic product (GDP) in 2022 were manufacturing; real estate, rental, and leasing; and healthcare and social assistance (IBISWorld 2023). Notably, while the agriculture, forestry, fishing, and hunting industry ranked 14th in GDP in Oregon, this industry had the largest growth rate of all industries in 2022 (17.2 percent) (IBISWorld 2023). Table 1.3 provides additional detail on the top three industries by GDP and growth of the agriculture, forestry, fishing, and hunting industry.

Table 1.3. Economic Trends in Oregon

Industry	Gross Domestic Product	Percent Growth in 2022	Annualized Growth Rate from 2017 to 2022
Manufacturing	36.2 billion	3.5%	3.0%
Real Estate, Rental, Leasing	31.5 billion	1.7%	1.6%
Healthcare and Social Assistance	20.2 billion	2.6%	2.0%
Agriculture, Forestry, Fishing, and Hunting	4.9 billion	17.2%	1.2%

Source: IBISWorld 2023

In 2022, the plan area represented 97.9 percent of the state GDP with an annualized growth rate similar to the state at 2.1 percent (U.S. Bureau of Economic Analysis 2022). Two counties in the plan area saw a decrease in GDP between 2018 and 2022 and several experienced GDP growth that was higher than the statewide average during that period; the variation in GDP growth among plan area counties indicates a wide range in the pace of economic growth for NFIP participating communities (U.S. Bureau of Economic Analysis 2022). The most recent data suggests that there were more than 32,300 farms in the plan area in 2022; about 28 percent of plan area county lands were designated as farmland at that time, ranging from 4 percent up to 81 percent (USDA Census of Agriculture 2022).

1.8.3. DEVELOPMENT TRENDS

Oregon plan area housing units totaled 1.65 million in 2020, with about 88,000 units, or 5.4 percent, located in an SFHA. SFHA housing units in 2020 ranged from 30 units in Gilliam and Sherman Counties to 13,900 units in Lane County. Between 2018 and 2022, residential building

permits were issued for almost 60,000 new structures in the plan area counties, with a total construction value of about $22.1 billion.[13]

When compared to all other U.S. states, Oregon had the 5th largest total dollar amount in residential construction and the 47th largest in nonresidential construction in the U.S. (IBISWorld 2023). Housing demand was projected for NFIP participating communities through 2045, assuming housing demand would grow proportionately with the population. The projections identified demand for more than 16,500 housing units annually for NFIP participating communities through 2045. Appendix D provides additional detail on projected housing demand.

1.9. Lead and Cooperating Agencies

Under NEPA, FEMA, as the lead federal agency, must evaluate the potential environmental and social effects of a range of alternatives and consider those impacts prior to making a decision (i.e., whether to implement proposed changes to the NFIP in the Oregon plan area). NEPA allows for the lead agency to invite other agencies to cooperate or participate in the preparation of NEPA documents. Cooperating agencies (42 USC 4336a) assist the lead federal agency in the NEPA process and typically review and comment on impacts related to their jurisdiction or special expertise.

The following cooperating agencies have participated in development of this draft EIS based on their special expertise or jurisdiction: NMFS, USFWS, DLCD, the City of Portland, and Tillamook, Benton, and Umatilla Counties. To the extent feasible, the cooperating agencies have participated in the analysis by providing information, comments, and technical expertise to FEMA; participated in coordination meetings; and provided input on issues as early in the process as is reasonably feasible. FEMA began coordination with cooperating agencies in 2023 after initiating the EIS process. The cooperating agencies provided valuable input that was incorporated into the purpose, need, alternatives, and environmental analysis of alternatives. FEMA appreciates the time and effort that the cooperating agencies have put into this Draft EIS and the revised 2024 Draft Implementation Plan. By factoring in differing perspectives across a large and diverse plan area, FEMA has developed a more robust plan and EIS.

1.10. Scope and Organization of this Draft EIS

This Draft EIS analyzes the potential effects of proposed modifications to the implementation of the NFIP in the Oregon plan area, as described in the 2024 Draft Implementation Plan (Appendix A), and compares them to effects anticipated with a No Action and other action alternatives.

[13] The value of residential building permits reflects the construction value, including materials, labor, utilities and associated construction needs; land values are not included in those estimates.

Chapter 1 provides an introduction and background.

Chapter 2 defines the purpose and need of the action.

Chapter 3 describes the alternatives analyzed.

Chapter 4 analyzes the alternatives for their environmental, social, and economic effects. The analysis is informed by concerns raised during public scoping (see Chapter 5) and both CEQ NEPA Guidance and FEMA NEPA requirements (see Section 1.1.1). Potential effects of the alternatives include both beneficial and adverse outcomes depending on the resource. Chapter 4 describes the regulatory context, existing conditions, and potential effects of the alternatives for each resource within the plan area (DHS NEPA Instruction Manual 023-01-001-01).

Chapter 5 describes the public, Tribal, and agency involvement that has occurred through the development of this draft EIS. It includes a summary of the public engagement process and input received. This chapter also includes information on agency consultations, cooperating agency input, Tribal input, and information on the public review and comment process for this Draft EIS.

Chapter 6 provides a list of preparers for this Draft EIS.

Chapter 7 provides a list of references for this Draft EIS.

Chapter 2. Purpose and Need

The purpose for the proposed action is to ensure that the implementation of the NFIP in the Oregon plan area is consistent with the requirements of the ESA and MSA. The proposed action is needed to avoid jeopardizing the continued existence of listed species, and to avoid, minimize, or otherwise offset potential adverse effects on EFH. The proposed action is necessary to implement the RPAs in the 2016 NMFS BiOp within the statutory and regulatory authorities of the NFIP.

The NFIA (42 USC 4001 et. Seq.) mandates that FEMA identify the nation's flood-prone areas and make insurance available to NFIP participating communities that implement floodplain management requirements that meet or exceed the minimum standards of the NFIP (42 USC 4002(b)(3)).

Section 7(a)(2) of the ESA requires that each federal agency shall ensure that any action authorized, funded, or carried out by such agency (such as the NFIP) is not likely to jeopardize the continued existence of any threatened or endangered species (ESA-listed species) or result in the destruction or adverse modification of their designated critical habitat. Section 305(b)(2) of the MSA requires federal agencies to consult with NMFS regarding whether their actions may adversely affect EFH.

The 2016 NMFS BiOp determined that the NFIP as implemented in the Oregon plan area would result in jeopardy of 16 listed fish species and the Southern Resident killer whale, result in destruction or adverse modification of designated critical habitat and adversely affect EFH.

The proposed action is to modify the implementation of the NFIP in the Oregon plan area as detailed in the 2024 Draft Implementation Plan (Appendix A).

Chapter 3. Alternatives

NEPA requires that any agency proposing a major federal action (as defined at 42 USC 4336) must consider a range of reasonable alternatives. The 2020 NEPA Regulations Final Rule and 1981 CEQ 40 NEPA Questions establish that "Agencies are not required to give detailed consideration to alternatives that are unlikely to be implemented because they are infeasible, ineffective, or inconsistent with the purpose and need for agency action."

FEMA's proposed action is to modify the implementation of the NFIP in the Oregon plan area as detailed in the 2024 Draft Implementation Plan (Appendix A). The alternatives analyzed in this draft EIS describe a No Action Alternative in which NFIP-ESA integration in the Oregon plan area would not occur, and two action alternatives (Alternative 2 and Alternative 3) in which NFIP-ESA integration in the plan area would occur. Identifying and analyzing alternatives is an essential part of the NEPA decision-making process. As part of the alternatives development, FEMA screened all alternatives, ideas, and options. FEMA eliminated some alternatives from further consideration and carried others forward for additional study.

FEMA has not yet identified a preferred alternative. Per DHS NEPA Instruction Manual 023-01-001-01, the preferred alternative will be identified in the Final EIS, once the public review and comment period for this Draft EIS has been completed, and all comments have been considered.

3.1. Alternative Development and Screening Process

3.1.1. DEVELOPMENT OF ALTERNATIVES

In developing alternatives, FEMA reviewed the 2016 NMFS BiOp and RPA using the purpose and need (Chapter 2) and screening criteria (Section 3.1.2). FEMA also considered each aspect of the RPA for its feasibility to be implemented under NFIP authority, Oregon land use laws, and local jurisdictional authorities. Floodplain management standards used by Oregon communities participating in the NFIP were reviewed to determine if existing mandatory efforts could ensure consistency with the 2016 NMFS BiOp RPA and could be implemented across the entire plan area.

FEMA worked with an interagency team of staff from FEMA and DLCD, with input from NMFS and interested stakeholders, to develop preliminary alternatives that could address the RPAs in the 2016 NMFS BiOp within the statutory and regulatory authorities of the NFIP as well as be able to be implemented by FEMA and NFIP participating communities. Between mid-2015 and late 2023, FEMA engaged with agencies, Tribes, stakeholders, and other interested parties regarding the integration of ESA compliance into the NFIP. Some outreach efforts were focused on better understanding local factors that influence fish presence within NFIP participating communities and to collaboratively identify changes that could be made to the NFIP to achieve ESA compliance. Others were focused on potential implications of, and resource needs related to, implementing ESA-related modifications to the NFIP program in Oregon. FEMA hosted dozens of webinars, workshops, feedback sessions, and

other meetings, all of which informed the process to develop alternatives that would meet the purpose and need of the proposed action.

During NEPA Scoping, in each public and targeted meeting, and in the NOI, FEMA emphasized the request that the public submit possible reasonable alternatives, including additional or alternative avoidance, minimization, and mitigation measures that achieve the standard of no net loss of three key natural floodplain functions. Alternatives identified through the alternative development process were screened based on three screening criteria, discussed in the sections below.

During NEPA scoping, FEMA also heard many requests that any proposals to modify the implementation of the NFIP in the Oregon plan area should not result in duplication of mitigation or conservation measures required for different permits, authorizations, and approvals. This request, which FEMA interpreted to be at odds with the 2016 NMFS BiOp, forms the basis of the difference between Alternative 2 and Alternative 3 (described in Section 3.3 and Section 3.4, respectively).

3.1.2. ALTERNATIVE SCREENING CRITERIA

NEPA (42 USC 4321 et seq) requires the evaluation of reasonable alternatives that meet the purpose and need for the proposed action and are technically and economically feasible. FEMA used the following three-part screening evaluation to identify reasonable alternatives: 1) consistent with purpose and need, 2) technically and economically feasible, and 3) implementation and anticipated impacts are different from those of other alternatives.

Criterion 1: Is the alternative consistent with the purpose and need for the proposed action?

The purpose and need of the action (see Chapter 2) must be met, including maintaining consistency with FEMA's existing NFIP statutory and regulatory authorities and the program's objectives. Alternatives (or a component of an alternative) that do not meet this criterion are eliminated from further evaluation. Section 3.5 summarizes alternatives eliminated from further evaluation.

Criterion 2: Is the alternative technically and economically feasible?

A proposal is technically feasible if it is based on sound planning and engineering and can be implemented under existing policy and legal frameworks. It cannot require or use an approach that relies on experimental or untested engineering or methods, nor can it contradict federal or state law. Further, it must be implementable per the 2016 NMFS BiOp's deadlines plus the three-year extension through Section 1246 of the Disaster Recovery Reform Act.

Evaluating whether a proposal is economically or financially feasible requires an analysis of complex factors such as direct costs of implementation versus projected benefits, estimated implementation schedules, financial constraints of the action agency and stakeholders, potential risks associated with implementation, and prudent investment of taxpayer resources. If a proposal is so costly that it could not be practically implemented or would necessitate expenditures that would far exceed potential benefits in relation to other proposed alternatives, it would not be economically or financially feasible. Pursuant to this analysis, FEMA did not eliminate any specific alternatives from additional analysis based exclusively on economic feasibility. Instead, potential economic and

financial infeasibility may have served as one factor in eliminating certain alternatives from further consideration.

Moreover, FEMA could not identify one solution that would fit all communities, given the diversity of Oregon communities. Therefore, any action alternative retained for evaluation was required to provide sufficient flexibility to be implementable based on a community's planning and engineering expertise.

Action alternatives retained for evaluation were required to be technically and economically feasible for a wide range of project proponents and developers. For example, both a single-family homeowner who wants to expand their driveway and a state transportation agency that needs to build a new bridge must be able to comply.

Criterion 3: Are the alternative's implementation and anticipated impacts different from those of other alternatives?

An EIS need not include every available alternative where the consideration of a spectrum of alternatives allows for the selection of any alternative within that spectrum. The discussion of environmental effects of alternatives need not be exhaustive but must provide information sufficient to permit a reasoned choice of alternatives for the agency to evaluate (Federal Register Volume 85, Issue 137, July 16, 2020).

CEQ guidance (formerly at 40 CFR 1502.14(b)) states that agencies shall "discuss each alternative considered in detail, including the proposed action, so that reviewers may evaluate their comparative merits." In other words, alternatives' benefits, drawbacks, and effects on the human and natural environment should be provided to enable a detailed comparison and inform decision-making.

3.1.3. ALTERNATIVE SCREENING RESULTS

Only action alternatives that meet all three screening criteria are evaluated in detail in this draft EIS. As discussed in Chapter 5, of the 960 comments received during scoping, 47 (4.9 percent) pertained to alternatives. The majority of these were overall objections to any type of NFIP-ESA integration (e.g., "this is a terrible idea," "We are requesting you withdraw the current proposal due to these adverse and detrimental impacts mentioned and re-draft rules that are consistent with community objectives, create opportunities for future development, and allow for flexibility at the state and local level to meet the intended outcomes"). Some suggestions were noteworthy but outside of FEMA's authority and therefore did not pass the first screening criterion (e.g., reduce hatchery output, better control fishing licenses to prevent overfishing, and controlling seal populations). Several ideas for improvement were presented by the public (e.g., "Can other land use ordinances help achieve the alternative measures, such as riparian or stormwater regulations?"). FEMA has incorporated many of these into the description of the paths. For example, Path B (Ordinance Checklist described in Section 3.3.2.2) allows communities to rely on existing riparian or stormwater regulations that meet the same no net loss standards described in Section 3.3.1. Those ideas that FEMA could not incorporate are presented in Section 3.5.

This Draft EIS presents two reasonable and distinct action alternatives that meet all three screening criteria. It also presents the No Action Alternative (Alternative 1) because NEPA (42 USC 4332(c)(iii)) requires the analysis of a No Action Alternative. This serves as a benchmark against which impacts of the reasonable alternatives can be evaluated. This Draft EIS will include a public review and comment period where FEMA will request input on the alternatives analysis (see Chapter 5). FEMA will consider all input received during this Draft EIS public review and comment period and develop a final EIS in which a preferred alternative will be identified. FEMA will develop a Record of Decision in which the selected alternative will be identified. **Figure 3-1** depicts the alternatives analysis process.

3.2. No Action Alternative (Alternative 1)

This Draft EIS includes the No Action Alternative to describe future conditions if the existing implementation of the NFIP in Oregon remains unchanged. Development in the floodplain is not contingent on the NFIP and would continue regardless of the NFIP. As such, under the No Action Alternative, development and redevelopment in the SFHA would be reasonably expected to continue. As described in Section 1.2, FEMA has no land use authority. Floodplain development (i.e., on-the-ground construction) is not authorized, funded, or carried out by FEMA pursuant to the NFIP. FEMA has no role in the issuance, denial, or enforcement of individual development permits.

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3 based on the floodplain management requirements in effect on October 1, 2024. Communities participating in the NFIP would continue to adopt the minimum floodplain management standards or adopt higher standards as described in Section 1.3.2. Implementation of the NFIP in the Oregon plan area as described in Section 1.3 would not include additional steps that NMFS determined in the 2016 BiOp to be necessary to address jeopardy of ESA-listed species and the Southern Resident killer whale, destruction or adverse modification of designated critical habitat, and adverse effects on EFH. Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would, according to the NMFS 2016 BiOp, not be consistent with the ESA and MSA requirements. Therefore, the No Action Alternative would not meet the purpose and need to implement the NFIP consistent with the NFIA and the requirements of ESA according to NMFS. For FEMA to analyze and describe the impacts in this NEPA document, FEMA assumes that for the No Action Alternative, the NFIP would continue to be available in the Oregon plan area in the long term.

Certain federal grants, loans, disaster assistance, and mortgage insurance would also continue to be available. Oregon communities in the plan area would continue to have access to FEMA's community assistance programs for floodplain management, expertise, and capacity. Other federal funding (e.g., USACE Civil Works and HUD Assistance) would not be impacted. Appendix D provides additional information on funding impacts that would result from the continuation of the NFIP in the Oregon plan area.

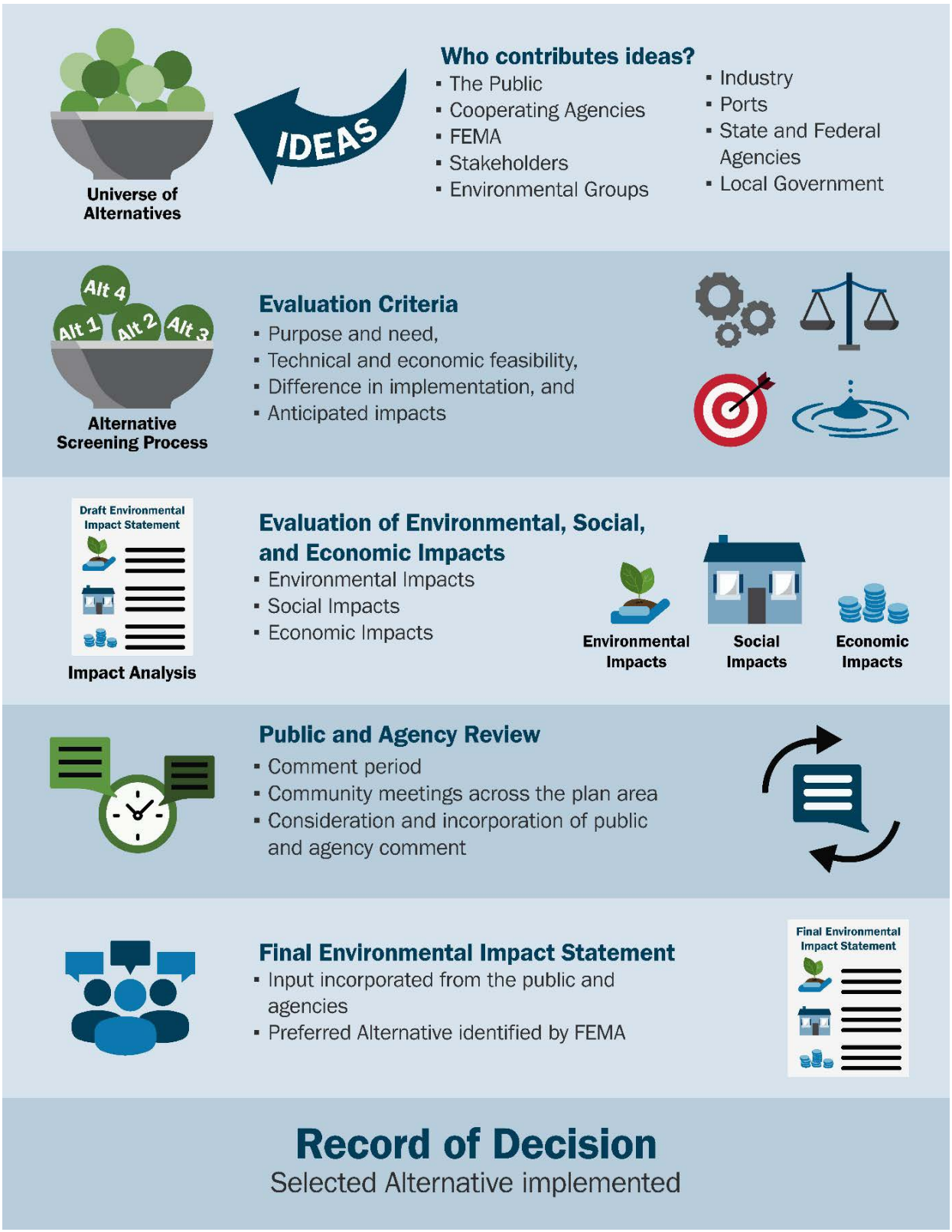

Figure 3-1. Alternatives Process

3.3. No Net Loss with Exception for Project-Specific ESA Compliance Alternative (Alternative 2)

Under Alternative 2, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3 with the addition of the no net loss standards for ESA and MSA (i.e., offsetting impacts on the three floodplain functions, implementing riparian buffer zone (RBZ) requirements, and reporting requirements as described in the following sections). Alternative 2 is designed to provide flexibility that reflects the diversity of communities and environments in Oregon. The no net loss standards for NFIP participating communities would apply only to those communities in the Oregon plan area (see **Figure 1-2**). Implementation of these standards would meet the purpose and need, thereby ensuring that implementation of the NFIP in the Oregon plan area is consistent with the requirements of the ESA and MSA. The key elements of Alternative 2 include the following:

- **No net loss standard for three floodplain functions**. All communities participating in the NFIP in the Oregon plan area would be required to meet the standards of no net loss for three floodplain functions for all applicable development in the SFHA (see Section 3.3.1 for details on the floodplain functions).
- **Riparian Buffer Zone (RBZ).** FEMA identified a standard 170-foot RBZ under Alternative 2. Applicable development in the RBZ (and the mapped floodway) would be subject to higher mitigation ratios in implementing the no net loss standards as described in Section 3.3.1 and potential planting requirements as described in Section 3.3.1.4.
- **Multiple and flexible paths (Paths A, B, C, and D)**. FEMA would offer communities flexibility in how a community might achieve community-wide compliance with the no net loss standards (see Section 3.3.2 for details and examples of this flexibility).
- **Applicability**. The no net loss standards would be applicable to all development, subject to limited conditions and exemptions (Section 3.3.3).
- **Exceptions for other ESA compliance**. This alternative would exempt a project from the no net loss standards if that project had secured ESA compliance through other means (Section 3.3.4).
- **Reporting and Enforcement**. Communities and FEMA would adhere to reporting requirements as described in Section 3.3.5.

Under Alternative 2, communities in the Oregon plan area that participate in the NFIP would be required to adopt and enforce floodplain management policies, procedures, ordinances, or regulations that meet or exceed the minimum floodplain management standards (Section 1.3.2.3), implement the no net loss standards, and report on metrics for assessing the impacts of SFHA development on ESA-listed species.

The proposed paths (Section 3.3.2) offer communities opportunities to account for other federal, Tribal, state, or local regulations or requirements that mandate equal or greater protection of floodplain functions than the no net loss standards. Such regulations may include, but are not

limited to, Oregon's Removal-Fill Law (ORS 196.795-990), Oregon's MS4 for water quality, or other requirements for tree protection as they may apply to a development in the SFHA.

The sections that follow further describe Alternative 2 including example methods to achieve the no net loss standards. Additional details and examples are provided in the 2024 Revised Draft Implementation Plan (Appendix A).

3.3.1. NO NET LOSS OF THREE FLOODPLAIN FUNCTIONS AND RIPARIAN BUFFER ZONE REQUIREMENTS

FEMA would continue to require implementation of the minimum floodplain management standards described in Section 1.3.2.3. Communities may continue to implement higher standards to receive credit through the CRS Program (Section 1.3.2.4). Project proponents would continue to implement mitigation and conservation measures required through other federal, state, and local permits, authorizations, and approvals as applicable (Section 1.4) and FEMA would continue the 7(a)(1) conservation program (Section 1.3.2.5). Additionally, FEMA would comply with its ESA and MSA responsibilities by requiring that NFIP participating communities adopt the no net loss standards.

Floodplain habitat can be described, protected, and monitored through a variety of means. Based on the recommendations from NMFS in the RPA (i.e., elements 2 and 4), FEMA has identified three specific and tangible floodplain functions based on their associated habitat value to achieve no net loss (i.e., flood storage, water quality, and vegetation). To quantify impacts from development on the floodplain functions, FEMA identified a measurable proxy for each of the three functions and mitigation ratios to offset impacts and achieve no net loss. The reference point for determining impacts and achieving no net loss is the condition at the time of the floodplain development permit application. In other words, the no net loss standards aim to ensure that impacts from each proposed development are offset so that there is no net change in the floodplain functions from pre-floodplain development permit application condition.

Developers can achieve no net loss by avoiding impacts, minimizing the degree or magnitude of impacts, and offsetting any remaining impacts through mitigation. Avoidance, minimization, and mitigation is a logical hierarchy, but FEMA cannot dictate that avoidance and minimization must occur prior to using mitigation, so long as no net loss is achieved. The floodplain functions, proxies, and mitigation methods and ratios are described in the following sections.

A greater than 1:1 mitigation ratio is necessary to account for underestimating impacts and poor performance in executing mitigation. This reasoning was the main argument for the ratios recommended in the NMFS BiOp and is further backed by a study conducted by the National Research Council, which found of nine wetland mitigation efforts, the average percentage of compliance was 69 percent (NRC 2001).

3.3.1.1. Flood Storage

Flood storage is the three-dimensional space (i.e., volume) between the existing ground and the BFE in which floodwaters flow in the SFHA (i.e., 1-percent annual chance flood, 100-year floodplain). The BFE is the elevation of water associated with the 1-percent annual chance flood (i.e., the elevation of the SFHA). Flood storage in the SFHA serves as important habitat for certain fish species at different life stages (Burgess et al. 2012). During flood events, fish disperse up into the SFHA, following slower moving waters away from high velocity flows in the floodway and the main channel (Burgess et al. 2012). While fish are in the flooded SFHA, fish benefit from the vegetation, insects, and other food sources that may be present. NMFS identified the importance of flood storage in the 2016 NMFS BiOp, RPA element 4.F.i.a.

When the SFHA is occupied by buildings, storage tanks, roads, or other development, the volume into which floodwaters spread may be reduced, resulting in deeper floodwaters. This increased depth can result in a higher velocity (i.e., speed) of floodwaters, which reduces the amount of slower moving floodwaters that provide a refuge for fish during flood events. When fish cannot find slower moving water during a flood, they will deplete their energy in the fast-moving waters, become disoriented, may be injured or die, or may be swept downstream to areas that are not suitable for their life stage. In addition, when something is placed or constructed in the SFHA (e.g., building a house), the volume occupied by the development becomes inaccessible to fish to use as habitat and no longer serves the function of flood storage. As such, the proxy for flood storage is flood storage capacity, which is the flood storage (i.e., volume) that is unoccupied by any development including, but not limited to, the addition of fill, structures, concrete structures (vaults or tanks), pilings, levees and dikes, elevated boardwalks, or any other development that reduces flood storage.

Certain development may result in a change in flood storage by placing structures or material in the SFHA at or below the BFE that reduces the volume available for floodwater, fish access and egress at the site, or both. Some development activities, such as building a berm, impede both floodwaters and access for fish from both the volume of the material placed to construct the berm as well as the volume behind the berm that is no longer accessible to floodwaters. The impact on flood storage capacity must consider the entire volume lost. That is, the impact on flood storage capacity must consider both the volume of the material placed during construction as well as the volume that is no longer available for floodwaters and fish.

Some development activities, such as building an elevated house over an enclosed or screened crawl space may be designed so that floodwaters can flow freely through the crawl space; however, because fish would no longer be able to access the crawl space for habitat there would be an adverse impact. The impact on flood storage capacity must consider both the displacement of floodwaters (i.e., where concrete or material was placed to elevate the house) as well as the displacement of fish habitat (i.e., the volume of the crawlspace).

Other development activities, such as building an elevated home on posts/piers, would have a smaller adverse impact (i.e., require less mitigation) because only the volume of the post/piers would reduce the volume available for floodwaters and fish habitat. In this example, during a flood, both floodwaters and fish would be able to flow freely under the structure. The impact on flood

storage capacity would include the volume of the posts/piers and any stairs or decking below the BFE.

Mitigation for flood storage capacity could include offsetting the volume of fill and/or structures placed in the SFHA by removing fill and/or structures elsewhere on site and in the SFHA. Because fish access and egress must be considered, the removal of fill, structures, or both cannot result in the potential for fish stranding (i.e., fish must be able to swim in and swim back out of the mitigation site). The replacement volume of flood storage capacity would need to be created at approximately the same flood level as the impact and occur at the ratios shown in **Table 3.1**. Appendix A provides additional details on mitigation for reduced flood storage capacity.

Table 3.1. Proposed Mitigation Required for Loss of Flood Storage

Location of Impact	Flood Storage Capacity Proportion of Mitigation to Impact (Mitigation:Impact)
Impact Occurring in the Mapped Floodway [1]	2:1
Impact Occurring in the RBZ [2]	2:1
Impact Occurring Outside the Floodway and RBZ, in remainder of SFHA	1.5:1
Mitigation Location Multipliers [3]	
Mitigation occurring on-site or off-site in the same reach [4]	100%
Mitigation occurring off-site, in a different reach, but within the same watershed (i.e., 10-digit Hydrologic Unit Code [HUC]) [5]	200%

Conditions:

1. *When the floodway is not mapped, the mitigation ratios for the RBZ and remainder of the SFHA would be used.*
2. *Impacts that occur in the RBZ must be mitigated in the RBZ.*
3. *Mitigation multipliers of 100 percent result in the required mitigation occurring at the same value described by the ratios above, while multipliers of 200 percent result in the required mitigation being doubled (2016 NMFS BiOp, Appendix 2.8-C, element F).*
    a. *For example, if a development would fill 1,000 cubic feet of flood storage capacity in the RBZ, then 2,000 cubic feet of new flood storage capacity would be required to be created. However, if only 500 cubic feet can be created on-site and in the same reach, the remaining 1,500 cubic feet created off-site along a different reach would need to be created at double the required amount. That is, another 3,000 cubic feet would need to be created at the off-site location in addition to the 500 cubic feet created on-site.*
4. *Reach is defined as a section of a stream or river along which similar hydrologic conditions exist, such as discharge, depth, area, and slope. It can also be the length of a stream or river (with varying hydrologic conditions) between major tributaries or two stream gages, or a length of river for which the characteristics are described by readings at a single stream gage.*
5. *Watersheds are determined by the U.S. Geological Survey using the 10-digit HUC area.*

3.3.1.2. Water Quality

Water quality plays an important role in the health of fish and ecosystems (Demeke and Tassew 2016). Impaired water quality such as elevated water temperature and the presence of pollutants can be harmful to listed fish as well as other aquatic organisms that the listed species forage on (U.S. Government Accountability Office 2023, NMFS 2016b).

Development adversely impacts water quality by adding surfaces that prevent precipitation and stormwater runoff from infiltrating into the ground (i.e., impervious surfaces) (Chithra et al. 2015). Pervious surface is identified as the proxy for water quality (2016 NMFS BiOp, RPA element 4.F.i.b).

Typical impervious surfaces include concrete, asphalt, wood, or other materials that water passes over instead of passing through. Although impervious surfaces do not directly generate pollutants, they prevent the natural process of water infiltrating into the ground where soils and plants filter out pollutants. Impervious surfaces collect debris and pollutants such as oils, gas, and chemicals (Frazer 2005, NMFS 2016b). When water washes across an impervious surface, it picks up pollutants. If the stormwater can infiltrate into the ground before reaching a surface water such as a stream or lake, many pollutants are filtered out. As the amount of impervious surface increases, the volume of stormwater carrying pollutants directly into surface waters increases (Chithra et al. 2015, NMFS 2016b). Impervious surfaces also typically absorb heat, which can warm water running across the surface and result in increased surface water temperatures, which can negatively impact fish (Frazer 2005, NMFS 2016b). In addition, impervious surfaces limit water infiltrating into the ground where it may be stored in an aquifer or move slowly toward a surface water. Stormwater runoff from impervious surfaces can result in erosion and increased turbidity in waterbodies, which can adversely affect salmon (Bash et al. 2001). Impervious surfaces reduce groundwater recharge into aquifers thus reducing stream flows (Frazer 2005, Sleavin et al. 2000).

Any increase in impervious surface within the SFHA, calculated by area (e.g., square feet), would require mitigation to achieve no net loss of water quality. Impacts on water quality would need to be mitigated using the ratios shown in **Table 3.2**. Section 3.2 of Appendix A provides additional details on mitigating reductions of pervious surface.

Mitigation could include offsetting the impact of new impervious surface area by removing an equivalent square footage of impervious surface elsewhere on-site. For example, a homeowner building a new shed could offset the impact by converting an existing impervious asphalt driveway to a pervious surface (e.g., pervious pavement). Mitigation could also occur by infiltrating the stormwater runoff from new impervious surface through low impact development (LID) or green infrastructure (e.g., rain garden, bioswale, green roof) in alignment with the Oregon Department of Environmental Quality (ODEQ) *Low Impact Development in Western Oregon: A Practical Guide for Watershed Health* (ODEQ No Date [N.d.]).

Table 3.2. Proposed Mitigation Required for Loss of Pervious Surface

Location of Impact	Impervious Surface Proportion of Mitigation to Impact (Mitigation:Impact)
Impact Occurring in the Mapped Floodway [1]	1:1
Impact Occurring in the RBZ [2]	1:1
Impact Occurring Outside the Floodway and RBZ, in remainder of SFHA	1:1
Mitigation Location Multipliers [3]	
Mitigation occurring on-site or off-site within the same reach [4]	100%
Mitigation occurring off-site, within a different reach, but within the same watershed (i.e., 10-digit HUC) [5]	200%

Conditions:

1. *When the floodway is not mapped, the mitigation ratios for the RBZ and remainder of the SFHA will be used.*
2. *Impacts that occur in the RBZ must be mitigated in the RBZ.*
3. *Mitigation multipliers of 100 percent result in the required mitigation occurring at the same value described by the ratios above, while multipliers of 200 percent result in the required mitigation being doubled.*
   a. *For example, if a development would create 1,000 square feet of new impervious surface, then 1,000 square feet of new pervious surface would need to be created. However, if only 500 square feet can be created on-site and in the same reach, the remaining 500 square feet created off-site along a different reach would need to be created at double the required amount as a result of the 200 percent multiplier. That is, another 1,000 square feet of pervious surface would need to be created at the off-site location, in addition to the 500 square feet created on-site.*
4. *Reach is defined as a section of a stream or river along which similar hydrologic conditions exist, such as discharge, depth, area, and slope. It can also be the length of a stream or river (with varying hydrologic conditions) between major tributaries or two stream gages, or a length of river for which the characteristics are described by readings at a single stream gage.*
5. *Watersheds are determined by the U.S. Geological Survey using the 10-digit HUC area.*

When stormwater infiltration is not possible because of poor soil composition (e.g., poor drainage or contaminated soils) or due to a high groundwater table, then stormwater retention would be required to ensure no increase in peak volume or flow from the pre-development peak discharge rate, unless the water discharges into the ocean. Treatment would be required to minimize pollutant loading such that at least 80 percent of the suspended solids are removed from the stormwater prior to discharging to the receiving water body. These requirements are informed by Oregon stormwater management guidance.[14]

3.3.1.3. Vegetation

Vegetation includes plants growing in the floodplain and on the edge of a waterbody, such as along streams or riverbanks. It includes both native and non-native plants that may have been planted as part of landscaping or that have become established on their own. Many floodplain vegetation areas include grasses, shrubs, trees, and forbs that are often able to tolerate periodic flooding. NMFS identified a need for no net loss of vegetation in the 2016 NMFS BiOp, RPA element 4.F.i.c.

[14] https://www.oregon.gov/deq/wq/Documents/CWSRFStormwaterStandards.pdf

Trees are an important subset of vegetation in the SFHA because they provide shade along the edge of the waterbody, which moderates water temperature; contribute material such as falling leaves, sticks, or large logs that serve as habitat for fish and provide food and nutrients to the aquatic ecosystem; and reduce the risk of erosion by stabilizing soils with their roots (Boyer et al. 2003, Florsheim et al. 2008, Segura and Booth 2010).

Development adversely impacts trees by removing them to accommodate equipment or clear the ground for fill, infrastructure, and structures. Trees 6-inches in diameter at breast height (dbh) or larger in the SFHA are particularly important in providing habitat benefits for fish species and thus are identified as the proxy for no net loss of vegetation (2016 NMFS BiOp, RPA element 4.F.i.c). Removal of trees 6-inches dbh or larger would need to be mitigated by requiring the replanting of native trees at the ratios shown in **Table 3.3**.

Table 3.3. Proposed Mitigation Required for Loss of Trees 6-inches Diameter at Breast Height or Larger

Location of Impact	Trees [3] Proportion of Mitigation to Impact (Mitigation:Impact)		
	(6-inches dbh to 20-inches dbh)	(Greater than 20-inches dbh to 39-inches dbh)	(Greater than 39-inches dbh)
Impact Occurring in the Mapped Floodway [1]	3:1	5:1	6:1
Impact Occurring in the RBZ [2]	3:1	5:1	6:1
Impact Occurring Outside the Floodway and RBZ, in remainder of SFHA	2:1	4:1	5:1
Mitigation Location Multipliers [4]			
Mitigation occurring on-site or off-site within the same reach [5]	100%	100%	100%
Mitigation occurring off-site, within a different reach, but within the same watershed (i.e., 10-digit HUC) [6]	200%	200%	200%

Conditions:

1. *When the floodway is not mapped, the mitigation ratios for the RBZ and remainder of the SFHA will be used.*
2. *Impacts that occur in the RBZ must be mitigated in the RBZ.*
3. *Trees planted for mitigation do not have a specified dbh; however, they must be native species.*
4. *Mitigation multipliers of 100 percent result in the required mitigation occurring at the same value described by the ratios above, while multipliers of 200 percent result in the required mitigation being doubled.*
   a. *For example, if a development would remove 12 trees greater than 6-inches dbh in the RBZ (assuming all are also less than 20-inches dbh), then 36 new trees would need to be planted. However, if only 20 new trees can be planted within the same reach, the remaining 16 that would need to be planted along a different reach would need to be planted at double the required number as a result of the 200 percent multiplier. That is, another 32 trees would need to be planted at the off-site location, in addition to the 20 planted on-site.*
5. *Reach is defined as a section of a stream or river along which similar hydrologic conditions exist, such as discharge, depth, area, and slope. It can also be the length of a stream or river (with varying hydrologic conditions) between major tributaries or two stream gages, or a length of river for which the characteristics are described by readings at a single stream gage.*
6. *Watersheds are determined by the U.S. Geological Survey using the 10-digit HUC area.*

3.3.1.4. Riparian Buffer Zone

The RBZ is the area of land that borders rivers, streams, lakes, and other bodies of water and provides important habitat components for fish, such as shade and food, and is a source of large woody material in the aquatic system (**Figure 3-2**). The RBZ is described further in Section 2.4 of Appendix A. The boundary of the RBZ is measured from the ordinary high water mark of a fresh waterbody (lake; pond; ephemeral, intermittent, or perennial stream) or the mean higher-high water mark of a marine shoreline or tidally influenced river reach. The RBZ includes the area between these boundaries on each side of the waterway, including the waterway channel. FEMA is not proposing to limit development in the RBZ. Instead, FEMA proposes to establish a standard RBZ that extends inland from the water 170 feet where development could continue to occur so long as the no net loss standards are implemented, including the RBZ stipulations explained below.

Should the standard 170-foot RBZ extend beyond the limits of the SFHA, the limits of the SFHA should be used because FEMA's authority under the NFIP only extends to the limits of the SFHA. That is, the no net loss standards only apply to areas within the SFHA.

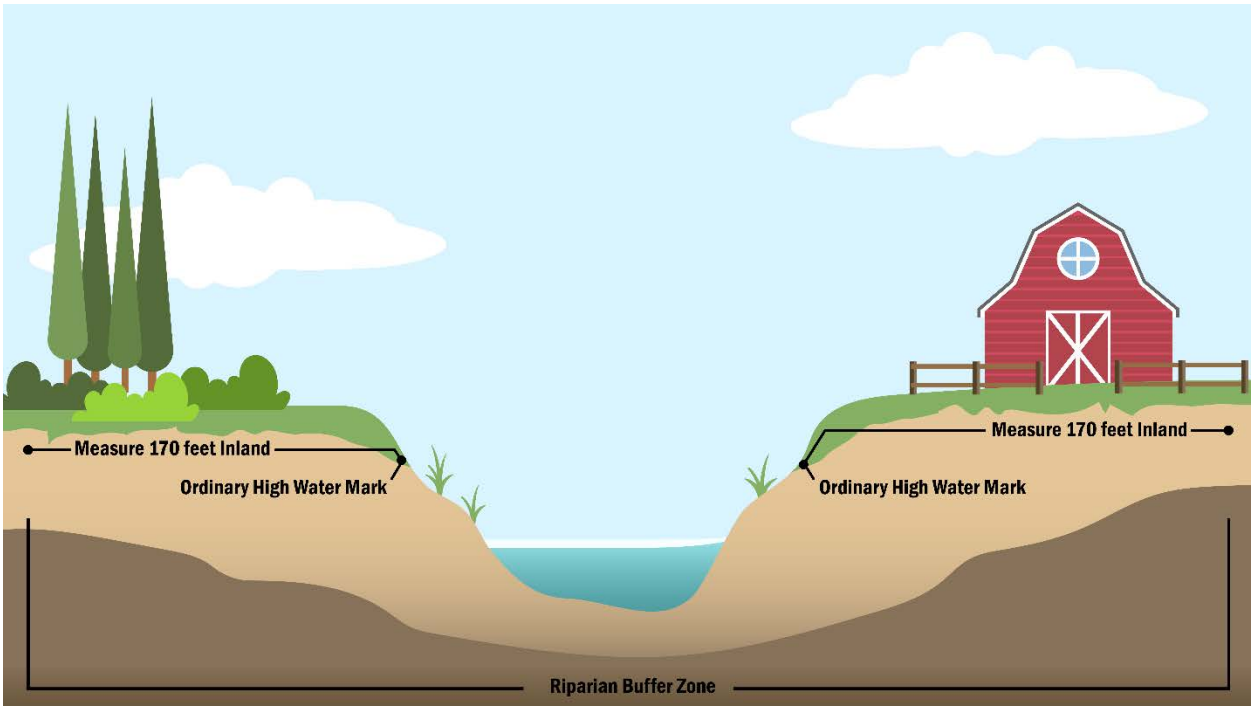

Figure 3-2. Riparian Buffer Zone

Development that is dependent on being located near a waterbody to function (i.e., functionally dependent uses) would need to implement the no net loss standards using the mitigation ratios in **Table 3.1** to **Table 3.3**. Development that occurs in the RBZ but is not a functionally dependent use would also need to implement an additional planting requirement, termed beneficial gain. Additional planting requirements for the RBZ account for its higher habitat value due to its proximity to water (Section 2.4 of Appendix A).

Definitions of Functionally Dependent Use and Beneficial Gain

Functionally dependent use: A use which cannot perform its intended purpose unless it is located or carried out in proximity to water. The term includes docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage, parking, passenger waiting rooms, or related manufacturing facilities.

Beneficial Gain: FEMA's beneficial gain standard would apply to development that is not a functionally dependent use that occurs within the RBZ. The standard would require that an area within the RBZ, within the same reach of the project, and equivalent to 5 percent of the area impacted within the RBZ (that is not a functionally dependent use) would be planted with native riparian herbaceous, shrub, and tree vegetation.

Under FEMA's beneficial gain standard, an area within the RBZ, within the same reach as the project, and equivalent to 5 percent of the area impacted within the RBZ (that is not a functionally dependent use) would be planted with native riparian herbaceous, shrub, and tree vegetation. Beneficial gain plantings are in addition to plantings required for no net loss of vegetation. Native vegetation creates a pervious surface that stores and filters stormwater to improve water quality; by preserving 5 percent of the RBZ against future development. Additionally, it addresses an aspect (native non-tree vegetation) of the vegetation function that was frequently mentioned in the 2016 NMFS BiOp beyond the required replanting to replace removed trees 6-inches dbh or larger.

3.3.2. MULTIPLE AND FLEXIBLE PATHS FOR COMMUNITY COMPLIANCE

During development of the 2021 Draft Implementation Plan and NEPA scoping, FEMA heard the need for flexibility given the diverse needs, capacities, policy contexts, and geographic constraints faced by NFIP participating communities within the plan area. A solution that could work in one community may not work in another community.

FEMA, with DLCD and stakeholders, identified four paths that communities could choose from to implement the no net loss standards. An NFIP participating community could implement one or more paths at multiple scales, so long as the entire SFHA in the community is covered by one path or another at all points in time. While many communities would likely initially choose to implement a single path over the entirety of their jurisdiction, it is possible, and in some cases may be preferable, for communities to implement different approaches within different parts of a jurisdiction.

For example, a city may implement the model ordinance (Path A) over most of its jurisdiction but apply the customized community plan (Path C) to a specific waterfront area that has both significant existing development and restoration potential. In addition, a community could change pathways over time—for example, using the ordinance checklist (Path B) in the near term while developing a customized community plan (Path C) for the long term. Jurisdictions could also consider an

interjurisdictional approach (e.g., neighboring communities or all communities within a larger basin) to balancing development impacts and restoration priorities at the watershed scale.

Paths for Oregon NFIP Communities to Implement Revised NFIP Floodplain Management Standards

Path A. Adopt a **model ordinance** that contains the required elements outlined below.

Path B. Complete and submit to FEMA an **ordinance checklist** to demonstrate that new or existing policies address the required elements.

Path C. Complete and implement an approved **customized community plan** that meets the no net loss standards at the community level. The community develops the plan, and FEMA approves the plan prior to community implementation.

Path D. Complete and implement a community-level **HCP** that is approved by NMFS, as outlined in Section 10 of the ESA or secure ESA compliance through a 4(d) approach.

The following sections describe each path.

3.3.2.1. Model Ordinance (Path A)

FEMA developed draft model ordinance language in consultation with NFIP participating communities and stakeholders that would ensure consistency with the no net loss standards. NFIP participating communities could adopt the model ordinance, as drafted. See Attachment B of Appendix A for the proposed draft model ordinance that could be used to implement Path A.

3.3.2.2. Ordinance Checklist (Path B)

An NFIP participating community may have elements of the model ordinance spread across multiple ordinances or other local, regional, or state-wide enforceable requirements. Communities choosing this path would use the checklist provided by FEMA to demonstrate where existing requirements are adequate to achieve each no net loss standard.

If existing codes or requirements do not cover all standards, communities would need to revise their current regulations or adopt a new ordinance to incorporate the missing requirements in the local code. Communities would have to submit the ordinance checklist to FEMA to document how the existing, revised, and new codes together meet the standards. FEMA would review the checklist and approve it, or provide feedback if not approved, to ensure consistency with the no net loss standards. See Attachment C of Appendix A for the Path B checklist.

FEMA appreciates that Oregon has a variety of land use and environmental protection laws, including Oregon's Removal-Fill Law (ORS 196.795-990) and MS4 requirements that at least partially address the no net loss standards. Some regions or communities may have additional regulations, see Section 1.4. The state and communities may introduce new requirements in the future. If any of these state, regional, or local requirements address one or more of the no net loss standards, an

NFIP participating community may use Path B to demonstrate compliance with those applicable elements if they achieve or exceed the no net loss standard for a given area. For example, the Removal-Fill Law applies to development in a wetland or waterway but does not account for the entire SFHA. MS4 only applies to certain types of development in urbanized areas. The community would need to adopt elements of the model ordinance for areas or development project types that are not covered by these other state, regional, or local requirements.

FEMA anticipates that communities may use this approach specifically for the water quality floodplain function, to demonstrate no net loss in the SFHA as mitigated through stormwater and water quality management. In the future, if state requirements change and apply to other types of development or geographic areas, communities could update their Path B checklist to demonstrate compliance and remove redundant requirements.

Paths A and B are similar; both would require that a community adopt all the required ordinance language in one ordinance (Path A) or across multiple ordinances or other requirements. Path B was designed, through stakeholder input, to offer more flexibility to communities.

3.3.2.3. Customized Community Plan (Path C)

Under this path, communities would have flexibility to determine their own approach to meeting the no net loss standard for the three floodplain functions both within and outside of the RBZ. See Attachment D of Appendix A for additional guidance.

Communities choosing this path would prepare a plan identifying and substantiating their reasoning for their proposed approach, methods for achieving no net loss, any additional requirements, deviations from the mitigation ratios or standard RBZ, and strategies for implementation (e.g., how the permitting process would collect data and enforce compliance).

Communities may work iteratively with FEMA in developing their plan. Each community would need to formally submit their plan to FEMA for review and approval to ensure the no net loss standards would be met. FEMA may consult with NMFS depending on the scale and complexity of the plan.

Communities may choose, but would not be required, to adopt revised ordinances under Path C. A community may adopt an approved plan through policy, resolution, procedures, or a change in the application requirements for a floodplain development permit, as long as all development in the SFHA demonstrates compliance with the no net loss standards as tailored to the specific community.

Path C may use different techniques depending on the number of floodplain development permits issued, location in the community, existing pre-permit conditions in the SFHA, species presence, or types of proposed development. A Path C approach may be applied uniformly across the entire SFHA in the jurisdiction or there may be different approaches applied to different parts of the SFHA or to different activities within the SFHA. Several potential Path C approaches are described here:

- Basic Approach: A community may submit a simple plan in which it adopts the default mitigation ratios and standard RBZ, explains how the community will require each floodplain development

permit application to comply with the no net loss standards, and describes methods of enforcement and reporting. This basic approach is different from Path A because it does not include adoption of the model ordinance, and different from Path B because it does not involve submission of a checklist demonstrating how the no net loss standards are already in local codes and regulations.

- Physical Conditions: A community may submit a plan identifying existing physical conditions that severely restrict one or more of the three floodplain functions.
- Revised Riparian Buffer Zone: A community may submit a plan to revise FEMA's standard 170-foot RBZ to no less than 50 feet or to more than 170 feet based on existing conditions.
- Revised Mitigation Ratios and Multipliers: A community may submit a plan that analyzes the quality of existing habitat in the SFHA and the presence of specific ESA-listed species within the community and propose:
  - Scientifically backed mitigation ratios or multipliers that achieve or exceed no net loss.
  - Variable mitigation ratios across the community based on the quality of habitat, existing performance of floodplain functions or benefits of carbon sequestration, proximity to waterways, land use, or other factors.
  - Alternative measurable standards that address no net loss for the three floodplain functions.
  - Alternative but equivalent, or additional, floodplain functions with measurable standards to propose for no net loss.
- Local Floodplain Impact Offset Actions: A community may submit a plan committing to mitigate all future SFHA development impacts on the floodplain functions through investment in open space, restoration, or programs that increase flood storage capacity, remove impervious surfaces or manage and treat stormwater, and plant native vegetation. Such investments could serve as advance mitigation for future floodplain development impacts within the community. If a community is proposing local floodplain impact offset actions, the mitigation must occur prior to or concurrent with the impacts from development.
- Incorporate Existing Regulations: Existing federal, state, and local regulations applied to development applications can be used under Path C to achieve no net loss (e.g., Municipal Separate Storm Sewer System, National Pollutant Discharge Elimination System). Depending on the type of development, the location of the proposed development within Oregon, or existing conditions on-site, existing regulations may apply and require mitigation actions that could support no net loss. Existing regulations that are more stringent than the no net loss standards can also be used under Path C.
- Regional Approach: A Path C plan could be developed jointly by multiple local jurisdictions, or even a state-wide effort. This could allow for a more watershed-scale or integrated regional approach to guiding development, restoration, and mitigation actions in the SFHA. Similarly, a state-level effort could result in a combination of regulations implemented by state agencies that achieve no net loss.

FEMA does not have an exhaustive menu of options that communities can select for their customized community plans because this path offers maximum flexibility.

3.3.2.4. Habitat Conservation Plan or Section 4(d) Limits (Path D)

Consistent with the 2016 NMFS BiOp (RPA 4.F.ii), Path D would allow communities to pursue compliance with ESA requirements at the community level by working directly with NMFS. Communities choosing this path could demonstrate consistency with Sections 9 and 10 of the ESA through development of a NMFS-approved HCP or Section 4(d) limit approval, if applicable, that covers land use decisions and development actions in the SFHA. Section 4.4 of Appendix A provides additional detail on HCPs and Section 4(d) limit approvals.

Once a community receives approval of its HCP and associated Section 10 Incidental Take Permit from NMFS or an approved Section 4(d) limit, the community would submit those documents to FEMA to document compliance with ESA and to continue as an NFIP participating community.

FEMA acknowledges that while Path D gives communities a viable path, the process of establishing an HCP involves a significant commitment of resources from the proponents, and it can be a difficult process that takes many years to complete.

FEMA recognizes that a particular project proponent (e.g., ODF) or organization may have an area-specific or project-specific Section 10 permit through an HCP or a Section 4(d) limit approval. These generally would not be community wide and would not fall under this path. Instead, these could apply to a particular floodplain development application as discussed under the exceptions for project-specific ESA compliance section (Section 3.3.4).

FEMA heard concerns about the applicability and limitations of both the HCP and 4(d) options during scoping (Chapter 5). For example, while NMFS has a Section 4(d) limit specific for local development (Limit 12: Municipal, Residential, Commercial and Industrial Development and Redevelopment), one commentor emphasized that Limit 12 has never been successfully used (NMFS 2003). In addition, a Section 4(d) limit would only apply to species listed as threatened, and many communities in the plan area have both threatened and endangered species present or potentially present within the community's waterways.

FEMA is including this path to accommodate communities that elect to start the HCP process now or in the future. Given that the development and approval of an HCP is a long-term endeavor, a community would be able to start with Path A, Path B, or develop a customized community plan (Path C), and then in the future could incorporate their customized community plan into a Path D HCP.

3.3.3. APPLICABILITY

The no net loss standards would apply only to actions that meet all the following conditions:

1. Occurs in an Oregon NFIP participating community within the plan area (**Figure 1-2**). A community in the plan area that joins the NFIP after the publication of this Draft EIS would be subject to the no net loss standards.
2. At the time of floodplain development permit submittal, the proposed development is located within the mapped SFHA on a community's FEMA-approved FIRM. As noted in Section 1.7, the mapped SFHA may change if the community adopts a new map or FEMA approves a LOMC.
3. Meet FEMA's definition of development: any human-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials. Note that the term "development" for the NFIP has not changed as part of NFIP-ESA integration and is not restricted to a building with walls and a roof. It is any disturbance (permanent or temporary) of the ground, which may include structures with walls or fill, but would also include development such as a new or expanded culvert, road, or driveway. Exceptions to this are referenced below.
4. Applies to all new development, redevelopment, and renovations outside of the existing development footprint. There are no exceptions for the value of the improvement; therefore, FEMA's NFIP substantial improvement threshold would not apply to these requirements. All development that would reduce flood storage capacity, reduce pervious surface, or remove trees 6-inches dbh or larger must comply with the no net loss standards.

Any human-made change to improved or unimproved real estate in the SFHA will require a permit from the applicable Tribal, state, or local jurisdiction. However, not all permitted actions would require mitigation for impacts on floodplain functions. The following activities would be exempt from the no net loss standards:

1. Maintenance, repair, or remodel of existing buildings, facilities, and utilities within their existing footprints, such as re-roofing, replacing siding, or replacing downed power lines and utility poles, provided there is no net change in footprint. This includes in-kind repair and replacement that occurs after a disaster (e.g., wildfire) so long as the footprint remains the same as that of the pre-disaster building, facility, or utility.
2. Normal street, sidewalk, driveway, and road maintenance (including farm and forest roads), including filling potholes, repaving, and installing signs and traffic signals, that does not alter contours, uses, or culverts. Exempt activities do not include vertical or horizonal expansion of paved areas.
    a. This includes resurfacing of roads that occurs within the same footprint as the existing roadway. The activity would be subject to the no net loss standards if it includes new shoulders, lane widening, or other actions that expand the road.
3. Routine maintenance of landscaping that does not involve grading, excavation, or filling.

4. Lawn care, gardening, removal of noxious weeds and hazard trees, and replacement of non-native vegetation.
    a. Gardening activities that include grading (e.g., altering the topography of the landscape to terrace a yard) or fill (e.g., stabilizing a slope using impervious rocks) would be subject to the no net loss standards.
    b. Hazardous trees are standing dead, dying, diseased, infested trees, or ones with a structural defect that makes it likely to fail in whole or in part and that present a potential hazard to a structure, or pose a safety threat from the risk of falling on a road, building, or otherwise creates a risk of damage or injury.
5. Routine agricultural practices such as tilling, plowing, harvesting, soil amendments, and ditch clearing that do not alter the ditch configuration provided the spoils are removed from the SFHA or tilled into fields as a soil amendment.
6. Routine silviculture practices (harvesting of trees), including hazardous fuels reduction and hazard tree removal, as long as root balls are left in place.
    a. Silvicultural practices must be carried out in compliance with applicable permits and regulations. Such activities include pruning, thinning, removing underbrush, planting, tending, burning infected trees, tree harvesting so long as root balls are left in place, and canopy alterations.
7. Normal maintenance of above ground utilities and facilities, such as replacing downed power lines and utility poles provided there is no net change in footprint.
8. Normal maintenance of a levee or other flood control facility prescribed in the operations and maintenance plan for the levee or flood control facility. Normal maintenance does not include repair of flood damage, expansion of the prism, expansion of the face or toe, or addition of protection on the face or toe with rock armor.
9. Habitat restoration activities.
    a. Must have the sole purpose of restoring habitat for ESA-listed species that have only temporary impacts and long-term benefits on habitat. Such projects cannot include ancillary structures, such as a storage shed for maintenance equipment, must demonstrate that no rise in the BFE would occur as a result of the project and obtain a CLOMR and LOMR and any other required permits (e.g., CWA Section 404 permit).
10. Temporary stockpiling or storage of materials and equipment. Temporary is defined as up to 6 months.
11. Pre-emptive removal of documented susceptible trees to manage the spread of invasive species.

During NEPA scoping, FEMA heard concerns about the no net loss standards' lack of consideration or credit for past restoration projects. The no net loss standards are forward looking. Since they only apply to new development or redevelopment in the SFHA of the Oregon plan area, they would require no net loss of floodplain functions associated only with future development. Past restoration and

recovery projects account for past human impacts on SFHA habitat. See Section 3.5.6 for additional information.

Additional details on applicable and non-applicable actions, including definitions, are provided in Appendix A.

3.3.4. EXCEPTIONS FOR PROJECT-SPECIFIC ESA COMPLIANCE

During the NEPA scoping process, FEMA heard numerous requests for an exception to the no net loss standards. Including RBZ requirements and beneficial gain as applicable, for development with project-specific ESA compliance. Therefore, Alternative 2 allows an exception to the no net loss standards for development with project-specific ESA Section 7 or Section 10 compliance.

A nexus is a connection or series of connections linking two or more things. A federal nexus indicates a relationship between a development and federal environmental review (i.e., subject to federal laws and executive orders). A federal nexus occurs when a development includes federal funding, permits, licensing, approvals, or is otherwise completed by a federal agency.

Some development activities in the SFHA may be subject to a Section 7 process via a federal nexus, such as federal funding (e.g., FEMA Mitigation grants), federal permits (e.g., activities requiring a CWA Section 404 permit), or federal licensing, that is not associated with the NFIP (see Section 1.4). Additionally, some activities (e.g., forestry and related activities) may achieve ESA compliance through an existing HCP (under Section 10 of the ESA). A project may also secure an ESA Limit 4(d) approval (e.g., hatchery expansion or ODOT road maintenance projects).

Compliance with the ESA and MSA ensures that the lead agency has accounted for potential impacts on ESA-listed species, critical habitat, and EFH if applicable. The outcome of this process may require offsets or mitigation that may include or may be different from the proposed no net loss standards for NFIP-ESA integration in the Oregon plan area.

Under this alternative (Alternative 2), if there is a federal nexus involved in a project for which a floodplain development permit is being requested, then the developer may use the federal agency's Section 7 process to document to the floodplain administrator that ESA compliance has been achieved, and the no net loss standards would not apply. For example, port and marina construction and maintenance activities that require approvals through USACE under Section 404 of the CWA, Section 10 of the Rivers and Harbors Act, or both, where USACE has completed a Section 7 process on effects to ESA-listed species, would not need to also apply the no net loss standards. Similarly, projects funded under FEMA's HMA grant program, where FEMA has completed a Section 7 process on effects to ESA-listed species would not need to also apply the no net loss standards. Projects with Section 7 compliance documentation acquired through these other federal review processes would not have to comply with the no net loss standards.

If a proposed project in the SFHA is a covered activity under an approved Section 10 HCP and associated Incidental Take Statement, that project would not be required to adhere to the no net loss standards. For example, road system maintenance and recreation infrastructure construction and maintenance under the Western Oregon State Forests HCP (if approved) would not have to comply with the no net loss standards because ESA compliance was achieved through Section 10 of the ESA.

If a project in the SFHA is a covered activity under a Limit 4(d) approval (e.g., ODOT roadway maintenance projects implementing BMPs identified in the Routine Road Maintenance Water Quality and Habitat Guide), the project would not have to adhere to the no net loss standards (ODOT 2020). Because Section 4(d) limit authorizations only cover specific threatened species, no net loss may still be required for development activities occurring within the plan area for endangered species. However, no net loss would not be required for activities covered under a Section 4(d) limit authorization that occur in areas where the endangered species are not affected.

3.3.5. REPORTING AND ENFORCEMENT

FEMA is developing a draft reporting tool for NFIP participating communities to use to comply with the reporting component of the no net loss standards. Reporting would include metrics for assessing the impacts of development in the SFHA on ESA-listed species. FEMA must obtain approval from the Office of Personnel Management for use of the reporting tool under the federal Paperwork Reduction Act. FEMA would notify communities of the data collection requirements and provide a reasonable amount of time for communities to gather the required information and establish a repeatable process.

In addition, FEMA would share additional reporting metrics on implementation of the no net loss standards with NMFS each calendar year. FEMA and NMFS may meet thereafter to discuss overall NFIP compliance and determine if re-initiation of the consultation is warranted.

FEMA would monitor communities for compliance with the minimum floodplain management standards contained in the federal regulations and the no net loss standards through the audit process (see Section 1.3.2.6). If further in-depth investigation is warranted, FEMA may elevate the level of auditing. FEMA is authorized to carry out investigations with respect to the adequacy of NFIP communities' measures in flood-prone areas, flood damage prevention, and other flood-related activities (42 USC 4102).

FEMA would refine the prioritization process for selecting communities for compliance audits with attention to habitat vulnerability, including the presence of listed species. Once the list is developed in coordination with DLCD, it would be provided for comment by NMFS each federal fiscal year before finalization. FEMA would perform 15 CAC and 10 CAV compliance audits per year in the plan area, with assistance from DLCD.

Communities that fail to implement the minimum floodplain management standards, the no net loss standards, or both would be subject to enforcement actions. The process for enforcement under

44 CFR 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 necessary corrections. Violations resulting in the loss of habitat or potential take of a species would result in a notification to NMFS for appropriate ESA enforcement action along with concurrent FEMA enforcement actions.

3.4. No Net Loss Without Exceptions for Project-Specific ESA Compliance (Alternative 3)

Alternative 3 encompasses the following components. As with Alternative 2, implementation of these standards would meet the purpose and need, thereby ensuring that implementation of the NFIP in the Oregon plan area is consistent with the requirements of the ESA and MSA.

- **No net loss standard for three floodplain functions**: this would be the same as that described for Alternative 2.
- **Riparian Buffer Zone (RBZ)**: this would be the same as that described for Alternative 2.
- **Multiple and flexible paths**: these paths and their inherent flexibility would be the same as that described for Alternative 2.
- **Applicability**: the no net loss standards would be applicable to the same conditions and exceptions as discussed for Alternative 2.
- **Exceptions for other ESA compliance**: this alternative differs from Alternative 2 in that it would require that all projects comply with the no net loss standards, including those that have secured ESA compliance through other means.
- **Reporting and Enforcement**: community and FEMA reporting requirements and enforcement activities would be the same as those described for Alternative 2.

The sections that follow describe the differences between Alternatives 2 and 3, explaining how they are distinct, which would result in different impacts as described in Chapter 4 of this Draft EIS. In accordance with the alternatives screening criteria (Section 3.1), Alternative 3 offers a distinct alternative, the impacts of which will inform decision-making.

3.4.1. NO EXCEPTION FOR PROJECT-SPECIFIC ESA COMPLIANCE THROUGH OTHER MEANS

Alternative 3 differs from Alternative 2 in that it would require the no net loss standards for projects that have secured ESA compliance through other means. Project proponents that have secured ESA compliance through other means would be required to implement the no net loss standards (unless the no net loss standards are already included in the project-specific ESA compliance results). This would include ESA Section 7 for projects with a federal nexus, ESA Section 10 HCPs, or any Section 4(d) Limit and FEMA's own PA and Hazard Mitigation grant programs.

Alternative 3 would provide additional protection for ESA-listed species, designated critical habitat, and EFH because developers would be required to implement measures identified through the project-specific ESA compliance process as well as the no net loss standards for the three floodplain

functions. Alternative 3 may result in greater requirements for mitigation measures or offsetting actions. Project proponents that receive federal funding, require a federal permit, or have otherwise consulted with NFMS, USFWS, or both (i.e., developed an HCP or coordinated on approval of a Section 4(d) limit) would likely have to implement a larger set of ESA compliance actions.

3.4.1.1. Type and Scale of Projects with Project-Specific ESA Compliance

Section 1.4.1 identified a range of circumstances where ESA compliance could be secured through a Section 7 process on federally implemented, permitted, or funded actions. The examples described in that section provide an overview of the range of projects that may take place in the SFHA, secure ESA compliance, and require a floodplain development permit, but there are likely many other types of projects that would meet these criteria.

FEMA received substantial public comment from potentially affected stakeholders (e.g., port, recreation, and transportation sectors) concerned about the potential for duplicate mitigation from a requirement to implement the no net loss standards in addition to any conservation and offsetting measures associated with other ESA compliance processes (e.g., through a permit approval). However, commentors were not able to provide specific numbers of projects or information about their potential impacts. FEMA does not have a statistically reliable estimate of the number of projects that would secure project-specific ESA compliance. FEMA worked with cooperating agencies and reviewed its Building Resilient Infrastructure and Communities (BRIC), Hazard Mitigation Grant Program (HMGP), and PA grant programs to provide some information about the potential for development in the SFHA to have a federal nexus resulting in ESA compliance through other means. This data and illustrative projects do not represent definitive historical numbers that reflect all actions. The available data informs the evaluation of the type and scale of projects that would be required to implement no net loss under Alternative 3 but that would not have to meet no net loss standards under Alternative 2 and is detailed in Section 4.1.1.3:

- Data provided by one of the Cooperating Agencies for this Draft EIS showed that, of the floodplain development permits issued for work outside an existing structure between 2013 and 2023, 16 percent may have had Section 7 compliance documentation. These projects include larger infrastructure projects (e.g., bridge replacement, fill/excavation, and culverts) that are more likely to have a federal nexus and would be required to adhere to the no net loss standards under Alternative 3.
- FEMA analyzed projects in Oregon funded through FEMA's BRIC program for fiscal year 2022 as well as through HMGP and PA programs for Disasters 4562 and 4599. All projects analyzed would have project-specific ESA compliance because FEMA would be required to review each project for compliance prior to making a funding decision. FEMA determined that approximately 30 percent of the projects analyzed were within the SFHA and would impact the floodplain functions. This data indicates that for projects where a federal agency may have a decision-making authority, approximately 30 percent might have impacts on the three floodplain functions.

While these numbers are not definitive, they illustrate the relative scale of difference between Alternative 3 where all projects would be required to adhere to the no net loss standards and

Alternative 2 where those with a federal nexus would not need to implement the no net loss standards.

Given the constraints of various data information systems including FEMA's, quantitative and comprehensive data cannot be reasonably obtained. Consistent with CEQ Guidance (formerly at 40 CFR 1502.21, Incomplete or unavailable information), FEMA declares that accurate project information is missing, and that the data provided in this draft EIS is incomplete. However, given public and stakeholder concern received during scoping, FEMA has determined that the number and scale of these projects warrant comparative evaluation. Therefore, Alternative 3 is a distinct and reasonable alternative.

3.5. Alternatives Considered and Eliminated

3.5.1. 2018 IMPLEMENTATION STRATEGY

Between 2016 and 2017, FEMA and DLCD hosted interagency conversations and stakeholder workshops focusing on possible paths to implement the RPA. In 2018, FEMA first provided the State of Oregon (DCLD) with an early review of the Draft Community Implementation Strategy (2018 Strategy) and later released it to the NFIP participating communities for input. The 2018 Strategy offered communities the choice of a Model Ordinance, Checklist for Programmatic Compliance, or a Parcel-by-Parcel Habitat Assessment in which the parcel developer evaluates site-specific conditions and proposes measures to avoid impacts on ESA-listed species.

After the State of Oregon, NFIP participating communities, and property owners expressed their concerns about the 2018 Strategy's parcel-by-parcel approach being subjective and discretionary, FEMA developed a new approach (Section 1.6.2) that resulted in objective and non-discretionary no net loss standards. Given that NEPA directs agencies to explore and evaluate reasonable alternatives to the proposed action (42 USC 4332), FEMA retained the option of a Parcel-By-Parcel Habitat Assessment as an alternative to be analyzed in early drafts of this Draft EIS provided to cooperating agencies in mid-2024. This provided cooperating agencies an opportunity to consider and provide their input. FEMA received comments similar to those received on the 2018 Strategy. In addition, stakeholders have expressed concerns about the technical expertise needed in the long term to develop, review, and determine the adequacy of habitat assessments.

The parcel-by-parcel approach may work well when the number of ESA-listed species potentially present is small, technical expertise in floodplain hydrology and function is available, and community permitting officials have specialized knowledge or access to that knowledge. However, in the 2016 BiOp, NMFS noted that, "many community permitting officials and permittees lack this specialized knowledge. While professional environmental consultants could help alleviate some concern, the permitting official would still need to be able to validate the accuracy of the assessment. Consequently, these officials are at risk of making determinations that are contrary to FEMA's expectations." (NMFS 2016a).

FEMA acknowledges that both the Puget Sound NFIP-ESA integration effort and the 2024 Oregon Pre-Implementation Compliance Measures offer the option for a parcel-by-parcel habitat assessment. However, FEMA has determined that there are different considerations for the long-term implementation of the NFIP for ESA integration in the Oregon plan area. For example, professional environmental consultants may be more readily accessible in the Puget Sound area compared to many parts of Oregon outside of the Interstate 5 corridor. In addition, the Puget Sound 2008 BiOp covers four ESA-listed fish while the 2016 NMFS BiOp in Oregon addresses 16 ESA-listed fish, thereby requiring a much broader biological specialization. The 2024 Pre-Implementation Compliance Measures approach offers a large cadre of FEMA-funded staff and consultants to assist communities in the interim. However, these personnel would not necessarily be available for the long-term implementation of NFIP-ESA integration in the Oregon plan area.

FEMA has re-evaluated the proposed parcel-by-parcel approach of the 2018 Strategy using the screening criteria presented in Section 3.1 and concludes, based on the discussion above, that implementation of the alternative in the Oregon plan area is not technically and economically feasible as a standalone alternative.

3.5.2. 2016 NMFS BIOP ALTERNATIVE

The 2016 NMFS BiOp provided six broad categories of actions for NFIP implementation that NMFS believes would avoid jeopardy for listed species and adverse modification of designated critical habitat (see Section 1.5). FEMA reviewed the components of the RPA using the screening criteria described in Section 3.1, including FEMA's existing statutory authority and the feasibility of implementation for NFIP participating communities. FEMA responded to NMFS with concerns about the components of the RPA based on the bounds of FEMA's authorities under the NFIA and the potential economical, technological, or logistical infeasibility of certain actions (FEMA 2016c).

Those components of the RPA that do not meet the criteria listed in Section 3.1.2, or have already been implemented, have been eliminated from the Draft EIS action alternatives.

RPA Element 2.D, which addresses changes to the review criteria for CLOMR and CLOMR-Fs, have already been addressed nationally through the May 2016 guidance that FEMA published on documenting ESA compliance for CLOMRs (FEMA 2016a).

RPA Element 3 would require FEMA to update its floodplain mapping to identify flood and flood-related erosion hazard areas. FEMA developed a pilot study to serve as a feasibility test for integrating the Element 3 mapping recommendations. NFIP implementing regulations establish the process for identifying flood hazards (44 CFR Parts 64, 65, 67, 70, and 72). These regulations require FEMA to develop flood hazard mapping with prescribed information and according to specific technical requirements. Any changes to floodplain mapping requirements must be reviewed and approved by FEMA headquarters. While work is ongoing to explore the feasibility of implementing RPA Element 3, any changes to floodplain mapping products would require changes to national mapping requirements (see Section 3.5.5).

RPA sub-element 4(a) would require regulatory changes to codify ESA floodplain management standards in 44 CFR Part 60. These regulations are national in scope, and thus revisions would be applied in environments and communities where they are not relevant. As described in further detail in Section 3.5.5, the 2016 NMFS BiOp in Oregon requires action to be taken based on the species and habitat present within the plan area. Species presence and critical habitat designations vary across the nation. As such, the measures needed to avoid jeopardy would similarly vary based on the species and habitats of concern in each location. Because FEMA's floodplain management regulations are national in scope, changes to the regulations to avoid jeopardy to ESA-listed species would need to include considerations for species throughout the country. The regulations could not be tailored enough to avoid jeopardy to specific species within a specific area and as such are not a suitable means to address the jeopardy determination issued by NMFS for the NFIP in the Oregon plan area.

3.5.3. HIGHER RESTRICTIONS

Subsequent to the 2009 lawsuit by Portland Audubon Society et al., environmental advocates proposed that all development should be prohibited within the floodway or SFHA. Higher restrictions could also include mitigation required for adverse impacts on habitat, such as spawning substrate or refuge habitat that were not specified in the 2016 NMFS BiOp.

While FEMA can condition a community's participation in the NFIP on the adoption of floodplain management standards, the federal government does not have the authority to completely prohibit development on non-federal property. See 42 USC 4102(c). Further, in the 2017 Errata to the 2016 NMFS BiOp, NMFS expressly stated that "The RPA was intended to allow for flexible approaches to accommodate new development in the riparian buffer zone that would result in an overall improvement of floodplain functions" (NMFS 2017). In the 2016 BiOp, NMFS focused on three floodplain functions (i.e., flood storage, water quality, vegetation).[15] Requiring mitigation for additional floodplain functions would impose unnecessary technical and cost burdens on communities and is not justified by NMFS' analysis. Therefore, based on the intention of the RPA and FEMA's existing authority, this alternative was dismissed because it does not meet the purpose and need and is not economically feasible.

3.5.4. STATE OF OREGON'S 5TH PATH

In their NEPA scoping comment letter (May 5, 2023, 2023-0007-0066), the State of Oregon requested that FEMA "consider adding a fifth option to its preferred alternative: the State's adoption of a package of regulatory measures that would apply to local governments and would result in the achievement of the no net loss component of the RPA." The State noted that "certain state agencies have extensive experience and expertise formulating and administering programs intended to address water quality, vegetation, and [flood storage]. A statewide program would reduce the compliance burden on local governments and provide assurance to local governments that the program is consistent with other state-law requirements." FEMA and the State have been working

[15] BiOp, RPA 2 and RPA 4

together to refine this option to determine whether it could be a distinct alternative that meets the screening criteria (Section 3.1.2), a distinct 5th path in Alternatives 2 and 3 (Section 3.3.2), or incorporated into an existing path. At this time, there is no statewide legislative package that would meet the purpose and need for this FEMA action. In the future, if the State introduces such a package, communities could use Path B or C to adopt the state implementation that addresses the no net loss standards and addresses any remaining gaps.

FEMA has worked with the State to ensure that existing requirements are addressed and do not require project proponents to duplicate mitigation resulting from existing state regulations. These include the State's Removal-Fill Law and MS4 requirements as discussed under Path B (Section 3.3.2.2). They also include the use of forestry HCPs addressed under exceptions for project specific ESA compliance under Alternative 2 (No Net Loss with Exception for Project-Specific ESA Compliance), in Section 3.3.4. Therefore, this 5th Path option is dismissed as a standalone alternative.

3.5.5. NATIONWIDE APPROACH

This alternative would propose nationwide approaches to NFIP-ESA integration rather than an Oregon specific plan. Some nationwide approaches have already been implemented, such as updated FEMA guidance requiring documentation of ESA compliance for CLOMRs (FEMA 2016a). However, the 2016 NMFS BiOp for Oregon requires action to be taken based on the species and habitat present within the plan area. The 2016 NMFS BiOp does not provide an analysis of, or propose methods to, avoid jeopardy for all species under NMFS jurisdiction across the nation. The action required, based on the findings of the 2016 NMFS BiOp for Oregon, is therefore not applicable to conditions across the nation.

Species presence and critical habitat designations vary across the nation. As such, the measures needed to avoid jeopardy would similarly vary based on the species and habitats of concern in each location. While nationwide approaches may be suitable for many locations and circumstances, a nationwide approach would not adequately avoid jeopardy in Oregon, and therefore, would not meet the purpose and need of the action. To address jeopardy in Oregon, a nationwide approach would result in unnecessary requirements in areas where the species present do not need the full suite of proposed measures to avoid jeopardy, or they may need different measures.

3.5.6. RESTORATION PROJECTS FUNDED BY FEMA OR OTHER ENTITIES

Under this alternative, FEMA would supplement the proposed no net loss standards of the NFIP by using other FEMA program funds (i.e., non-NFIP, disaster-related grant funding programs authorized under the Stafford Act) to purchase land to protect and restore floodplain functions in the SFHA in Oregon. Similarly, communities would be able to consider previous restoration projects or implement future restoration projects as a method of achieving no net loss.

There is no current statute that authorizes FEMA to purchase land to protect and restore the SFHA for ESA species benefit. Therefore, it would not be feasible for FEMA to use disaster-related grant funds to purchase land to protect and restore floodplain functions in the SFHA because it is not

within FEMA's statutory authority. FEMA disaster-related funding is constrained by the authority provided by Congress, which focuses on providing grant funding to Tribal, state, and local governments for hazard mitigation and pre-disaster mitigation projects to protect life and reduce property damage. Under disaster-related grant programs, FEMA does not purchase land, identify projects, or implement projects. Rather, Tribal, state, and local governments apply for FEMA funding to implement locally identified projects. Because FEMA does not identify or implement projects under disaster-related grant programs, FEMA cannot use these program funds to identify and implement projects to restore floodplain functions.[16]

Habitat restored through previous community led restoration projects (i.e., completed prior to the implementation of the no net loss standards) is considered the existing condition from which the effectiveness of the no net loss standards is evaluated. Similarly, impacts from development in the SFHA that occurred prior to the implementation of the no net loss standards are also considered part of the existing condition and would not need to be retroactively mitigated. If the floodplain benefits from previously completed restoration projects were used to mitigate impacts from future SFHA development, conditions would worsen compared to the existing condition. No net loss of the three floodplain functions would not be achieved and the implementation of the NFIP in the Oregon plan area would not be consistent with the requirements of the ESA and MSA. Therefore, the purpose and need for the agency action would not be met.

Future restoration projects implemented by communities could be used as a method of mitigating development impacts in the SFHA to achieve no net loss under Path C.

3.5.7. FOOTPRINT INCREASE EXEMPTIONS

As discussed in Section 1.5, FEMA initiated formal consultation with NMFS under the ESA in 2011 on the implementation of the NFIP in the Oregon plan area. During this consultation, FEMA proposed that the need to mitigate for adverse impacts on the three floodplain functions would not apply to improvements or repairs to existing structures, including utilities, that do not exceed a 10 percent increase of a structure's existing footprint. In the 2016 BiOp, NMFS did not agree with this proposed exemption because it would not account for cumulative adverse effects or consider the potential for significant loss depending on the location of the expansion. Further, NFMS indicated that the 10 percent increase exemption would not retain continuity across time and property ownership (e.g., a single owner could request multiple expansions of 10 percent each or a series of successive property owners could each request exempt expansions). As such, implementation of a 10 percent footprint increase exemption could not ensure avoidance of jeopardy to listed species and adverse modification of habitat. Similarly, any exempt increase in footprint would not ensure avoidance of jeopardy. Therefore, the purpose and need for the agency action would not be met.

[16] Locally identified and implemented projects funded by FEMA's disaster-related grant programs may provide secondary benefits that preserve or restore floodplain functions (e.g., habitat restoration for flood risk reduction).

3.5.8. NO NFIP IN THE OREGON PLAN AREA

During the development of this Draft EIS, including initial drafts of this chapter that FEMA shared with cooperating agencies (see **Table 5.6**), FEMA had assumed that for the No Action Alternative, the NFIP would no longer be available in the Oregon plan area in the long term. The following factors informed FEMA's initial approach:

- Question 3 of CEQ's 1981 40 NEPA Questions 46 FR 18026 (March 23, 1981) discussed considerations that agencies could take when designing the No Action Alternative. The agency could define the alternative as continuing the present course of action based on existing legislation and regulation without accounting for new plans. Alternatively, no action would mean that the proposed plan does not take place, and the analysis considers the resulting effects and the consequences of predictable actions by others.
- The 1986 regulation changes (51 FR 15620) discussed problems with the worst-case analysis requirement and modified the language to account for "reasonably foreseeable" impacts which may have catastrophic consequences, even if their probability of occurrence is low" (CEQ guidance, previously at 40 CFR 1502.21(d)).

However, as FEMA continued the development of this Draft EIS and considered internal and cooperating agency review of preliminary drafts, FEMA re-visited its initial assumptions given that the worst-case analysis requirement was not in the NEPA regulations when FEMA initiated the development of this EIS, and that the scenario was not reasonably foreseeable or predictable. In addition, when cooperating agencies reviewed the No-NFIP No Action Alternative, questions arose about the regulatory and procedural process to eliminate availability of the NFIP in the Oregon plan area. Therefore, FEMA has decided to present the No Action Alternative as a continuation of the NFIP as it is currently implemented, as described in Section 3.2.

Chapter 4. Affected Environment and Potential Impacts

NEPA requires federal agencies to evaluate the potential environmental, social, and economic impacts of their proposed actions prior to making a decision. As a federal agency, FEMA is therefore required to evaluate the direct, indirect, and cumulative impacts of the proposed action to modify the implementation of the NFIP in the Oregon plan area, as detailed in the 2024 Draft Implementation Plan (Appendix A).

Technical reports pertaining to economics, water quality, floodplains, and biological resources are included in the appendices to this Draft EIS to provide additional detail about the potential impacts on these resources.

4.1. Methodology for Impact Analyses

The methodology for the impact analyses was initiated by gathering data on the current condition of each resource from existing data sources, determining the limitations of the data, and establishing necessary assumptions to complete the NEPA analysis. Additional information on data sources and associated limitations are available in Appendix F. FEMA developed several example projects (see Appendix E) to depict potential changes to resources associated with the alternatives. FEMA evaluated how each alternative would or would not change the conditions of (i.e., impact) a resource and determined the magnitude and significance of potential changes.

4.1.1. DATA ASSUMPTIONS AND LIMITATIONS

This section describes the data assumptions and limitations that influence the analysis of all resources in this Chapter. Data assumptions and limitations that are specific to a resource are described in the respective resource section.

4.1.1.1. Type and Scale of Floodplain Development Permits

FEMA does not have data available to predict the precise number of future floodplain development permits, types of development, or location of development. The amount of future development expected in Oregon is based on the demand for new residential, commercial, and industrial facilities to support population and economic growth. The location, type, and density of development is governed by statewide land use planning goals, enforced through the OAR and ORS, and locally through comprehensive plans and zoning (see Section 4.2 for additional information).

Development in Oregon is further governed by the designation of urban growth boundaries (UGBs). Each city in Oregon is surrounded by a UGB, which designates where a city expects to grow over a 20-year period. Generally, the UGB defines where urban development ends and rural (e.g., exclusive farm zoning) or forest resource land begins. New developments such as houses, industrial facilities, businesses, and public facilities (e.g., parks and utilities) would be expected to predominantly occur within UGBs. Expansion of UGBs in Oregon occurs through a joint effort involving the city, county,

special districts that provide services, the public, and the state. Proposed UGB expansions must show a substantive need for the expansion (e.g., population growth or inadequate land availability) and amendments to UGBs must be reviewed by DLCD when a metropolitan service district proposes to add more than 100 acres of land, or a city with a population of 2,500 or more proposes to add more than 50 acres of land to its UGB (OAR 660-025-0175). In 2024, the Oregon legislature passed Senate Bill (SB) 1537, which established a one-time UGB tool for cities that allows an expedited and limited expansion of UGBs for cities. However, for a community to use this tool, they must show a need and 30 percent of all homes built must be affordable. Land allotted for this expansion cannot be high-value farm or forest land outside of urban reserves already designated for future urban development and is capped at no more than 75 or 150 acres, depending on city population.

Since 2016, 40 expansions of UGBs have been approved by the state, which equates to a 95 percent approval rate (DLCD 2023). Once a UGB expansion has been approved, the added land must be incorporated into the comprehensive plan and zoned. Changes to comprehensive plans and zoning regulations are also reviewed by DLCD for alignment with statewide planning goals, statutes, and rules.

Development in Oregon is also influenced by several state housing initiatives. For example, Oregon Executive Order 23-04 established a statewide housing production goal of 36,000 homes annually. Oregon House Bill (HB) 2138 allows for denser home building in cities of 25,000 or greater.

According to the *Economics Technical Report* (Appendix D), The population of the Oregon plan area was almost 4 million in 2020, having grown by 1 percent annually since 2010 and is projected to increase by about 0.9 percent annually between 2020 and 2045 (Portland State University 2023). Employment has grown by a rate of 1.7 percent annually since 2010 and is projected to grow by 1.0 percent per year through 2032. Thus, FEMA used available permit data (2019–2023) in selected jurisdictions to predict the collective amount of development that would occur across the Oregon plan area and be subject to the alternatives.

Between 2010 and 2020, an average of 1,520 new housing units were constructed each year within the SFHA in the Oregon plan area (U.S. Census Bureau 2022c). The majority of incorporated communities grew by fewer than 10 new homes per year in the SFHA between 2010 and 2020. Unincorporated portions of Washington and Douglas counties saw the largest increases in housing units in the SFHA, with approximately 170 and 150 units per year, respectively. The annual average of 1,520 new housing units in the SFHA between 2010 and 2020 represents approximately 11 percent of the annual average 13,820 new units constructed across the state during the same time period (U.S. Census Bureau 2022c). This shows that most new homes in Oregon were developed outside of SFHAs between 2010 and 2020.

Residential building permit data displayed in **Table 4.1** offers some insight into residential development for selected jurisdictions. Data were obtained from the State of Oregon's ePermitting system, ACCELA. However, not all communities in Oregon use this system. Data regarding the number of building permits in other communities in the Oregon plan area or on the decision-making processes of individual developers are not available.

Only a fraction of all building permits result in ground disturbance. The bulk of building permit applications are for internal electrical, plumbing, and other minor renovations. Permits for "ground-disturbing activities" would represent a development activity that might trigger implementation of the no net loss standards. Ground-disturbing permits for residential activity do not all represent the construction of new housing; many permits would be for accessory structures such as garages or outbuildings that might also trigger implementation of the no net loss standards. Data from selected communities in Umatilla, Benton, and Tillamook counties indicate that relatively few ground-disturbing permits have been issued for the development of residential-related structures in the SFHA in the past 5 years. Data for those communities indicate that much more residential construction occurs outside the SFHA. In addition, the proportion of ground-disturbing residential building permits *within the SFHA* compared to *outside of the SFHA* in NFIP participating communities is lower than the proportion of *land in the SFHA* to *land outside of the SFHA*. The *Economic Technical Report* (Appendix D) further discusses factors that may influence development decisions.

Table 4.1. Summary of Residential Building Permit Data for Selected Jurisdictions in the Oregon Plan Area, 2019–2023

Community	Total Residential Permits[1]	Ground-Disturbing Permits[2]	Ground-Disturbing Permits in SFHA[2]	Percent of Ground-Disturbing Permits in SFHA	Percent of Land in the SFHA
Umatilla County					
City of Umatilla	912	419	0	0.0%	4.5%
Umatilla Metropolitan Statistical Area[3]	161	27	0	0.0%	Not Available
Total	**1,073**	**446**	**0**	**0.0%**	**0.8%**
Benton County					
Corvallis	3,812	384	11	2.9%	10.8%
Monroe	853	159	6	3.8%	16.9%
Philomath	1,336	292	18	6.2%	21.5%
Philomath Metropolitan Statistical Area[3]	1,320	235	Not Available	Not Available	Not Available
Total	**7,321**	**1,070**	**35**	**3.3%**	**13.6%**
Tillamook County					
Nehalem	140	10	0	0.0%	25.9%
Neskowin[4]	26	5	1	20.0%	51.7%
Netarts[4]	2	2	0	0.0%	2.4%
Pacific City[4]	10	4	2	50.0%	24.2%

Community	Total Residential Permits[1]	Ground-Disturbing Permits[2]	Ground-Disturbing Permits in SFHA[2]	Percent of Ground-Disturbing Permits in SFHA	Percent of Land in the SFHA
Rockaway Beach	1,329	160	23	14.4%	31.3%
Total	**1,507**	**181**	**26**	**14.4%**	**5.0%**

Sources: ACCELA 2024; U.S. Census Bureau 2022c; FEMA SFHA shapefiles; and Harvey Economics.
Notes:
1. Total residential permits include all types of construction including but not limited to redevelopment, internal renovations, and new structures.
2. Ground-disturbing permits include but are not limited to single-family units, multifamily structures, carports, driveways, and patios.
3. In ACCELA, metropolitan Statistical Area permits are issued by the county for addresses in the city but located outside the city's UGB. Geospatial data for Metropolitan Statistical Areas is not available to determine percentage of land in the SFHA.
4. Community does not participate in the NFIP but is included to illustrate the number of permits.

Recent historical commercial and industrial building permit data were also reviewed to better understand the potential for development activity in the SFHA. Table 4.2 identifies commercial and industrial building permits issued within the SFHA for selected communities from 2019 through 2023.

Table 4.2. Summary of Commercial and Industrial Building Permit Data for Selected Jurisdictions in the Oregon Plan Area, 2019–2023

Community	Total Commercial and Industrial Permits[1]	Ground-Disturbing Permits	Ground-Disturbing Permits in SFHA[2]	Percent of Ground-Disturbing Permits in SFHA	Percent of Land in the SFHA
Umatilla County					
City of Umatilla	751	89	0	0.0%	4.5%
Umatilla Metropolitan Statistical Area[3]	46	8	1	12.5%	Not Available
Total	**797**	**97**	**1**	**1.0%**	**0.8%**
Benton County					
Corvallis	525	43	4	9.3%	10.8%
Monroe	140	17	0	0.0%	16.9%
Philomath	416	34	4	11.8%	21.5%
Philomath Metropolitan Statistical Area[3]	173	44	Not Available	Not Available	Not Available
Total	**1,254**	**138**	**8**	**5.8%**	**13.6%**

Community	Total Commercial and Industrial Permits[1]	Ground-Disturbing Permits	Ground-Disturbing Permits in SFHA[2]	Percent of Ground-Disturbing Permits in SFHA	Percent of Land in the SFHA
Tillamook County					
Nehalem	72	4	1	25.0%	25.9%
Neskowin	3	0	0	0.0%	51.7%
Netarts	0	0	0	0.0%	2.4%
Pacific City[4]	0	0	0	0.0%	24.2%
Rockaway Beach	158	9	4	44.4%	31.3%
Total	**233**	**13**	**5**	**38.5%**	**5.0%**

Sources: ACCELA 2024; U.S. Census Bureau 2022c; FEMA SFHA shapefiles; and Harvey Economics.
Notes:
1. *Total commercial permits include all types of construction including but not limited to redevelopment, internal renovations, and new structures.*
2. *Ground-disturbing permits include construction of new buildings (including businesses, public facilities, ancillary structures, agricultural or equine use structures, etc.) and other activities that would result in the creation of additional impervious surface, such as additions or driveways.*
3. *In ACCELA, metropolitan Statistical Area permits are issued by the county for addresses in the city but located outside the city's UGB. Geospatial data for Metropolitan Statistical Areas is not available to determine percentage of land in the SFHA.*
4. *Community does not participate in the NFIP but is included to illustrate the number of permits.*

These building permit data indicate that 1) most commercial and industrial building permits are not issued for new commercial structures, and 2) very few new commercial structures were built in the SFHAs of the selected communities during this period.

4.1.1.2. Land Use Implications

No scientific research is available to definitively characterize the extent to which the NFIP influences development or development decisions within the SFHA. During the development of this Draft EIS, FEMA found two reports (dated 2004 and 2006) that summarized past studies and provided recommendations:

- "Reducing Flood Losses: Is the 1% Chance Flood Standard Sufficient?" is a report of the 2004 Assembly of the Gilbert F. White National Flood Policy Forum, prepared by the National Academies Keck Center for the Association of State Floodplain Managers (ASFPM) Foundation.
- "Managing Future Development Conditions in the National Flood Insurance Program" is a report prepared in 2006 by the American Institutes for Research as part of the 2001–2006 evaluation of the NFIP. The independent research was subcontracted with FEMA funds and did not necessarily reflect FEMA's views or policies about the NFIP.

The 2006 report emphasized the weaknesses in scientific credibility that persist even today:

> "Although it would be highly desirable to apply rigorous quantitative techniques to the assessment of the NFIP's developmental and environmental impacts, the ability to do so is problematic. Much research has confirmed that the asserted linkage between the availability of flood insurance and resulting impacts on development or the environment may be indirect, at best, and confounded by competing explanations not easily separated."

These reports draw two relevant and contradictory conclusions. On one hand, the NFIP is understood to exert some level of influence on development patterns (American Institute for Research 2006). In some cases, the NFIP may have indirectly influenced development within the SFHA by reducing the financial risk to property owners and communities through its provision of flood insurance and disaster relief (American Institute for Research 2006). On the other hand, the ASFPM Foundation has found that the implementation of the NFIP may have had the opposite effect of influencing development to occur just outside of the SFHA as developers may attempt to avoid the additional regulations that are in effect within the SFHA or the added costs of flood insurance for certain types of mortgages (ASFPM 2004).

In this Draft EIS, FEMA is using the term "developer" to describe any property owner, person, or agency taking an action that meets the definition of development.

FEMA was unable to find recent published peer-reviewed studies that resolve these opposing positions, and none were made available to FEMA during or after the NEPA scoping period. Therefore, it is unclear whether development would be induced or hindered in the SFHA under any alternative. It is impossible for FEMA to quantify the effect that the alternatives may have on the number of developments within the SFHA.

CEQ's NEPA guidance (formerly at 40 CFR 1502.21) provide guidance for situations where information relevant to reasonably foreseeable significant effects cannot be obtained. Therefore, FEMA is clarifying that although such information would be germane to the impacts assessment, it is unavailable, and the analysis will present the scenarios with the greater potential for adverse impacts. FEMA infers from these regulations that the EIS is to present reasonably foreseeable effects that have "catastrophic consequences, even if their probability of occurrence is low" as long as the analysis is within the rule of reason (formerly at 40 CFR 1502.21(d)).

Therefore, for the purposes of this EIS analysis under NEPA, FEMA makes the following assumptions for the identification of impacts:

- This Draft EIS assumes that the implementation of the no net loss standards under Alternative 2 and Alternative 3 could influence some development to move outside of the SFHA but remain clustered in proximity to the SFHA. For the purposes of this analysis, FEMA makes the assumption that development that may be influenced to move outside of the SFHA to ensure that this Draft EIS discusses the potential impacts of the alternatives on resources. However, it is unlikely that implementation of the proposed action would influence all development to occur outside of the SFHA because some developments may remain in the SFHA because of a

requirement or preference for proximity to waterways. Numerous factors may influence local development decisions.

- For the purposes of this NEPA analysis, indirect impacts (which were formerly defined at 40 CFR 1508.1) are assumed to induce effects both inside and outside of the SFHA as a result of changes in the implementation of the NFIP in the Oregon plan area. By including an identification of indirect impacts in this NEPA analysis, FEMA is not implying or suggesting that these induced effects are caused by the NFIP under any alternative.

4.1.1.3. Type and Scale of Projects with Project-Specific ESA Compliance

Section 1.4.1 identified a range of circumstances where ESA compliance could be secured through a Section 7 process on federally implemented, permitted, or funded actions, through Section 10 HCPs, or through Section 4(d) limit approvals. These examples include FEMA PA and Hazard Mitigation grants; activities with CWA Section 404 permits (e.g., port, harbor, and marina improvements), HUD funded projects, ODF HCP covered activities (if approved), and ODOT roadway maintenance covered under Section 4(d) limit approvals. These examples provide an overview of the range of projects that may take place in the SFHA, secure ESA compliance, and require a floodplain development permit.

FEMA does not have a statistically reliable estimate of the number of projects that would likely secure project-specific ESA compliance. However, FEMA worked with cooperating agencies and reviewed its BRIC, HMGP, and PA grant programs to provide some information and illustrative projects that may represent development in the SFHA with a federal nexus resulting in ESA compliance. This data does not represent definitive historical numbers that reflect all actions. The available data informs the evaluation of the type and scale of projects that would be required to implement no net loss under Alternative 3 but that would not have to meet no net loss standards under Alternative 2:

- Data provided by one of the Cooperating Agencies for this Draft EIS showed that, of the floodplain development permits issued for work outside an existing structure between 2013 and 2023, 16 percent may have had project-specific ESA compliance documentation. While the number of permits in the data is small, larger infrastructure projects (e.g., bridge replacement and culverts) are more likely to have a potential federal nexus and would be required to adhere to the no net loss standards under Alternative 3. For example, one FEMA-funded flood mitigation project in an Oregon NFIP participating community in the plan area required 6,000 cubic yards of new fill (impact on flood storage), 2 miles of road widening (impact on water quality through loss of pervious surface), and the removal of an unknown number of trees greater than 6-inches dbh (impact on vegetation). If this entire project was in the SFHA, the mitigation required to achieve no net loss of the three floodplain functions would exceed the combined mitigation required for many other smaller projects.
- FEMA analyzed projects in Oregon funded through FEMA's BRIC program for fiscal year 2022 as well as through HMGP and PA programs for Disasters 4562 and 4599. All projects analyzed would have project-specific ESA compliance because FEMA would be required to review each project for compliance prior to making a funding decision. FEMA determined that approximately 30 percent of the projects analyzed were within the SFHA, would require a floodplain

development permit, and had a change in footprint or included components that would impact the floodplain functions. Although this data point is not a percentage of floodplain development permits that can be reasonably expected to have project-specific ESA compliance, it indicates that of the projects where a federal agency may have a decision-making authority, approximately 30 percent might have impacts on the three floodplain functions.

While these numbers are not definitive, they illustrate the relative scale of the difference between Alternative 3 where all projects would be required to adhere to the no net loss standards and Alternative 2 where those with a federal nexus would not need to implement the no net loss standards. Consistent with guidance formerly at 40 CFR 1502.21, and for the purposes of this Draft EIS analysis under NEPA, FEMA makes the following assumptions:

- Approximately 16 percent of development projects in the SFHA of NFIP participating communities can be reasonably expected to have project-specific ESA compliance through other means. As such, approximately 16 percent of development in the SFHA of NFIP participating communities would be subject to the no net loss standards under Alternative 3 but not under Alternative 2.
- Any given NFIP participating community, developer, or agency may individually experience a higher proportion of projects in the SFHA that would obtain project-specific ESA compliance and also result in impacts on the three floodplain functions than the assumed average of 16 percent. For example, as an agency, ODOT may have more than 16 percent of its projects with a federal nexus that results in project-specific ESA compliance. These individual proportions over 16 percent are assumed to be up to 30 percent based on FEMA's analysis of FEMA grant program data.

4.1.2. DIRECT AND INDIRECT IMPACTS

Direct impacts (formerly at 40 CFR 1508.1) are those which are caused by the alternatives and occur at the same time and place. Indirect impacts are those which are caused by the alternatives and occur later in time or are farther removed in distance but are still reasonably foreseeable. Indirect impacts include induced changes to the actions of others, such as construction methods and related impacts on air, water, other natural systems. Indirect impacts also include induced changes to land use patterns, population density, or growth rates.

As described in Chapter 1 of this Draft EIS, FEMA's role under the NFIP is limited. While FEMA sets the minimum floodplain management standards under the NFIP, FEMA does not authorize, fund, or carry out development[17] in the SFHA, nor is floodplain development encouraged by FEMA.[18] Communities that choose to participate in the NFIP adopt the minimum floodplain management standards (or

[17] Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials (44 CFR 59.1).

[18] FEMA does provide funding to communities for projects that may occur in the SFHA under programs other than the NFIP, such as through Public Assistance and Hazard Mitigation grants as well as under the National Flood Mitigation Fund established through the NFIA.

higher regulatory standards, see Section 1.3 of this Draft EIS) to gain access to federally underwritten flood insurance and federal assistance. Communities ensure compliance with and enforce the NFIP floodplain management standards through local floodplain regulations and permit processes. Developers that choose to proceed with a project in the SFHA must implement the community's adopted floodplain management standards by complying with local floodplain regulations and permit requirements when carrying out development.

The alternatives do not involve authorizing, funding, undertaking, or encouraging development in the SFHA. As such, there would be no physical development or ground disturbance in the SFHA that would occur as part of, or at the same time and place as, FEMA's implementation of an alternative. Therefore, there would be no direct impacts from the alternatives, other than potential direct costs to FEMA for implementation. However, future development in the SFHA is reasonably foreseeable. Indirect impacts would occur as communities ensure compliance with and enforce local floodplain regulations that meet or exceed the minimum floodplain management standards of the NFIP, and developers proceed with projects in the SFHA. While indirect impacts would occur, development in the SFHA itself is not a federal action because development in the SFHA is authorized by NFIP-participating communities and is subsequently carried out locally.

4.1.3. CUMULATIVE IMPACTS

Cumulative impacts (40 CFR 1508.1) are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions. Cumulative effects can result from actions by any proponent with individually minor but collectively significant effects that may occur over a period of time.

The analysis of alternatives in this chapter includes an evaluation of the existing condition of each resource, which considers the current state of the resource (based on past actions that have occurred) and indicates the present condition. As discussed in Section 4.1.2, the alternatives would have no direct impacts beyond FEMA; indirect impacts on the environment associated with the alternatives are tied to reasonably foreseeable future development. As such, FEMA's analysis of indirect impacts encompasses reasonably foreseeable actions.

As former 40 CFR 1508.1 notes, cumulative impacts can result from actions with individually minor but collectively significant effects over time. Under all alternatives, future development in the SFHA of the Oregon plan area is reasonably foreseeable based on projected population and economic growth. While an individual development may have minor impacts, the incremental impact of multiple developments over time or across the Oregon plan area could be collectively significant. As discussed in Section 4.1.1, FEMA does not have data available to predict the precise number of future floodplain development permits, types of development, or location of development. However, based on projected population and economic growth, the rate of development in the Oregon plan area is anticipated to remain the same or be slightly smaller than from 2010 to 2020. Thus, FEMA used available permit data (2019–2023) in selected jurisdictions to predict the collective amount of development that would occur across the Oregon plan area and be subject to the alternatives. As such, FEMA's analysis of Oregon plan area scale impacts encompasses the collective impacts of

development across time and across the plan area to account for collectively significant effects that may occur from implementation of the alternatives. The Oregon plan area scale thereby encompasses the cumulative incremental effects of the alternatives and reasonably foreseeable actions. As each discretionary decision is made at the community, landowner, and developer levels, the sum of the various indirect effects would be the cumulative effect of the alternatives at the Oregon plan area scale.

4.1.4. ANALYSIS OF ALTERNATIVES

FEMA evaluated how each alternative would or would not change the conditions of (i.e., impact) a resource. FEMA determined whether a change in conditions would occur through a comparative analysis.

FEMA first identified the existing conditions of each resource. Existing conditions refers to the current social and environmental state of the resource, as determined through data available during the preparation of this Draft EIS. Existing conditions includes physical characteristics like land use, topography, water quality, vegetation, and other environmental factors.

As discussed in Section 4.1.2, FEMA does not authorize, fund, or carry out development in the SFHA under the NFIP.[19] Therefore, no direct impacts would occur as a result of the alternatives, other than potential direct costs to FEMA for implementation. However, future development in the SFHA is reasonably foreseeable based on population and economic growth factors (Section 4.1.1.1). With the implementation of an action alternative, future development in the SFHA could result in indirect impacts from induced changes, such as construction methods and related impacts on air, water, other natural systems, or the cost to develop. The general impact of development on a resource that would occur regardless of the alternative is analyzed as part of the **existing conditions**. FEMA compared the impacts of the alternatives to existing conditions of development in this Draft EIS to determine the indirect impacts specifically associated with the action alternatives. In summary, existing conditions describe the general impacts that are occurring in the plan area and would reasonably occur from continued development in the SFHA regardless of the NEPA alternative implemented.

In addition, CEQ guidance (formerly at 40 CFR 1502.14(d)) require the No Action Alternative to serve as a benchmark against which impacts of the reasonable alternatives (Alternative 2 and Alternative 3) can be evaluated. As such, FEMA analyzed how impacts under Alternative 2 and Alternative 3 compared to the No Action Alternative. FEMA also compared the impacts of Alternative 3 to Alternative 2 to further distinguish potential consequences of the alternatives.

Further, FEMA analyzed Alternative 2 and Alternative 3 with the assumption that the no net loss standards would be predominantly implemented under Path A – Model Ordinance (see Section 3.3.2).

[19] FEMA does provide funding to communities for projects that may occur in the SFHA under programs other than the NFIP, such as through Public Assistance and Hazard Mitigation grants as well as under the National Flood Mitigation Fund established through the NFIA.

FEMA recognizes that community implementation through other paths could result in varying impacts and benefits to resources at the community scale. However, FEMA is not able to predict the extent to which each path would be utilized by communities, nor what communities may propose under Path C – Customized Community Plan. For resources where FEMA is able to identify variation in potential impacts between the implementation paths, the impacts are discussed in the respective resource section. For example, FEMA examined the potential costs of implementing various paths (Section 4.3) and considered how existing HCPs or Section 4(d) Limits (Path D) might influence impacts on transportation (Section 4.15).

4.1.5. MODEL PROJECTS

As described above, impacts from the alternatives would occur indirectly through community-level decisions and activities, as well as through public and private development decisions and actions in the SFHA. FEMA developed several example projects to depict some of these indirect impacts associated with the alternatives. The example projects were developed to cover a range of developments that could be reasonably expected in the SFHA. The example projects are detailed in Appendix E and summarized in Table 4.3.

Table 4.3. Model Projects Description

Model Project	Details
A. Residential New Build – Single-Family Home	This example project portrays the construction of a new single-family home in which the design of the home did not incorporate measures to avoid or minimize impacts on the three floodplain functions. While this example project is portrayed as a single-family home, it could also represent a nonresidential building of the same dimensions.
B. Port Improvements	This example project portrays a more complex project making improvements to an existing port, which includes some project design elements to address impacts on pervious surfaces. In addition, this project would require a permit from USACE, thus depicting differences between Alternative 2 and Alternative 3.
C. Existing Parking Lot to Large Building	This example project portrays redevelopment. This project highlights how the existing conditions of a site (i.e., already developed) can reduce the impacts associated with a project and may be designed to achieve more than the minimum required no net loss.
D. New Barn for Storage	This example project portrays an agricultural development. This example project is an enclosed barn. While the materials stored in the barn are assumed to be above the BFE, because there is the potential for fish stranding and the barn is enclosed, the entire footprint of the barn is considered an impact on flood storage.

4.1.6. IMPACT MAGNITUDE AND SIGNIFICANCE

FEMA evaluated the magnitude and intensity of potential benefits or adverse impacts based on the criteria shown in **Table 4.4**.[20] The magnitude and intensity of economics impacts were evaluated using the criteria shown in Section 4.3.2. In addition, FEMA evaluated the significance of impacts for each resource. The criteria used for determining the significance of impacts are unique to each resource and described in each resource's respective section. FEMA's determination of significance considers the resource-specific significance criteria as well as the magnitude and intensity of potential impacts (**Table 4.4**).

Table 4.4. Impact Magnitude and Context Evaluation Criteria

Impact Scale	Criteria
No Impact	The resource would not be affected.
Negligible	Changes to the resource would be either non-detectable or, if detected, would have effects that would be slight and localized. Impacts would not conflict with regulations and would be well below regulatory standards.
Minor	Changes to the resource would be measurable, although the changes would be small and localized. Impacts would not conflict with regulations and would be within or below regulatory standards.
Moderate	Changes to the resource would be measurable at larger geographic scales (e.g., coastal or Willamette Valley). Impacts may conflict with regulations.
Major	Changes would be readily measurable and would have substantial consequences across the entire Oregon plan area. Impacts may conflict with regulations.

4.2. Land Use

Land in Oregon is governed by a comprehensive land use planning system founded in 19 statewide land use planning goals. Most of the goals function as guidelines, suggesting how a goal may be applied in any particular community, but are not mandatory. Other goals are enforced through OAR, ORS, and locally through comprehensive plans and zoning. Under statewide planning Goal 2, each local government in Oregon must develop and implement a comprehensive land use plan and associated zoning regulations. Comprehensive plans are reviewed by DLCD for alignment with the statewide planning goals and acknowledged or approved. Once acknowledged or approved, the comprehensive plan becomes the mechanism for local land use decision-making.

Aside from federal and Tribal land, all land in Oregon is encompassed in a land use plan and zoned. The comprehensive plan and zoning ordinances are the basis for local governments to make land use decisions. Comprehensive plans and zoning determine where certain types of development can occur, such as residential, commercial, and industrial development, as well as guide public

[20] The impact magnitude scale for assessing economic impacts was adjusted slightly to account for potential increases in the cost of development (Appendix D).

development including streets, water services, and parks. Zoning also specifies farm zones and forest zones, which serve to protect natural resources and resource-based industries. Zoning may or may not reflect the current use of the land. For example, a presently undeveloped parcel of forest may be zoned for residential use. In this case, the land cover or land use would be forest; however, zoning allows the land to be used and developed for residential purposes.

Development in Oregon is further governed by the designation of UGBs, as detailed in Section 4.1.1.1. Each city in Oregon is surrounded by a UGB, which designates where a city expects to grow over a 20-year period. Development in Oregon is also influenced by several state housing initiatives. For example, Oregon Executive Order 23-04 established a statewide housing production goal of 36,000 homes annually. Oregon HB 2138 allows for denser home building in cities of 25,000 or greater. Oregon SB 8, enrolled in 2021, requires local governments to allow development of certain affordable housing on lands not zoned for residential uses and allows establishment of certain affordable housing at an increased density (i.e., greater than the underlying zoning). Oregon HB 4134 is the final component of a $376 million dollar Emergency Housing Stability and Production Package designed to ease the housing burden on Oregonians. The bill provides a little over $7 million in grants to smaller Oregon cities including Burns, McMinnville, Amity, and Toledo for infrastructure projects to assist in increasing housing stock.

At the local level, land use is enforced through the permit review process for consistency with the local comprehensive plan and zoning. The local government reviews permit applications for proposed developments, including alterations to existing structures and new construction, to ensure they meet standards for safe construction and that the proposed use of the land (e.g., residential, commercial, industrial) aligns with the local comprehensive plan and zoning of the land to be developed.

4.2.1. EXISTING CONDITIONS

As discussed in Section 1.7 and presented in **Figure 4-1**, the Oregon plan area encompasses approximately 58.8 percent of land in Oregon and NFIP participating communities in the Oregon plan area encompass approximately 93.2 percent of the population. Approximately 3.3 percent of land within the Oregon plan area is also within the SFHA, where the proposed action and alternatives would apply. This 3.3 percent of land within the SFHA of the Oregon plan area encompasses approximately 4.5 percent of the state population and 4.7 percent of the population in NFIP participating communities in the Oregon plan area. Community specific data is presented in Appendix F.

As detailed in Section 4.1.1, development in Oregon is based on the demand for new residential, commercial, and industrial facilities to support population and economic growth. According to the *Economics Technical Report* (Appendix D), between 2010 and 2020, an average of 1,520 new housing units were constructed each year within the SFHA in the Oregon plan area (U.S. Census Bureau 2010, U.S. Census Bureau 2020). The annual average 1,520 new housing units in the SFHA between 2010 and 2020 represents approximately 11 percent of the annual average 13,820 new units constructed across the state during the same time period (U.S. Census Bureau 2010, U.S.

Census Bureau 2020). This shows that most new homes in Oregon were developed outside of SFHAs between 2010 and 2020.

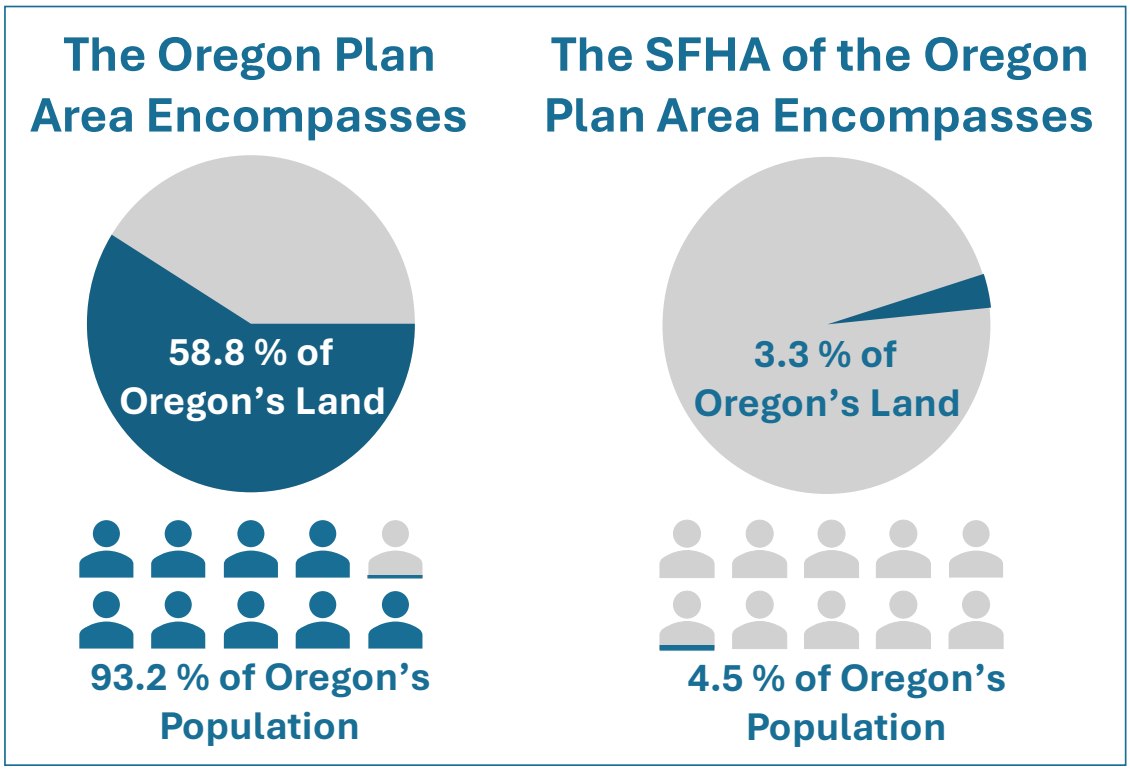

Figure 4-1. Area and Population of the Oregon Plan Area and Special Flood Hazard Area

Only a fraction of all building permits result in ground disturbance, which might trigger implementation of the no net loss standards. Data from selected communities in Umatilla, Benton, and Tillamook counties indicate that relatively few ground-disturbing permits have been issued for the development of residential-related structures in the SFHA in the past 5 years (range from 0 to 14 percent of permits). Data for those communities indicate that much more residential construction occurs outside the SFHA. In addition, the proportion of ground-disturbing residential building permits *within the SFHA* compared to *outside of the SFHA* of NFIP participating communities is lower than the proportion of *land in the SFHA* to *land outside of the SFHA*. Section 4.1.1 provides additional details.

Recent historical commercial and industrial building permit data were also reviewed to better understand the potential for development activity in the SFHA. These building permit data indicate that 1) most commercial and industrial building permits are not issued for new commercial structures, and 2) very few new commercial structures were built in the SFHAs of the selected communities during this period.

In Oregon, the terms city and town are generally used interchangeably and refer to an incorporated municipality.

For incorporated cities and towns in the Oregon plan area, about 5.4 percent of residential acreage and about 14.3 percent of commercial and industrial acreage is located within the SFHA overall.[21] The majority of land zoned for residential, commercial, or industrial purposes within those communities is located outside the SFHA and would therefore not be subject to the alternatives. However, some communities, such as the City of Adams, have 100 percent of residential and commercial zoned land in the SFHA, which would be subject to the alternatives. Incorporated cities and towns are municipalities that are incorporated by the state and have their own elected governing bodies. Unincorporated areas are the remainder of the land base and are governed by the counties. Incorporated areas are generally associated with a designated UGB and are where residential, commercial, and industrial development is expected to be concentrated under Oregon state land management laws and policies. Per Oregon state land use laws and regulations (OAR 660-024), development activities occur primarily within UGBs. Data by county as presented in this Draft EIS represents the entire county area including both incorporated and unincorporated areas unless otherwise noted.

Available data indicate that 90 percent of SFHA land in the Oregon plan area is zoned as farm, forest, parks, or open space, while 7 percent is zoned residential, and 3 percent is zoned commercial/industrial. Of course, there is a wide variation of zoning districts among plan area jurisdictions. For areas within a UGB, the land in the SFHA may be comprised entirely of residential, commercial, and industrial zoned land (Appendix F).

The most recent data from the USDA Census of Agriculture suggests that there were more than 32,300 farms in the plan area in 2022; about 28 percent of county lands in the Oregon plan area were defined as farmland, ranging from 4 percent up to 81 percent (USDA Census of Agriculture 2022). **Figure 4-2** depicts the wide range in percentage of farmland across counties in the Oregon plan area.[22]

[21] Both of the terms city and town are used in the ORS to mean an incorporated municipality under the Oregon State Constitution. Incorporated municipalities are the entities with general authority over local matters.

[22] Data includes incorporated communities within county boundaries.

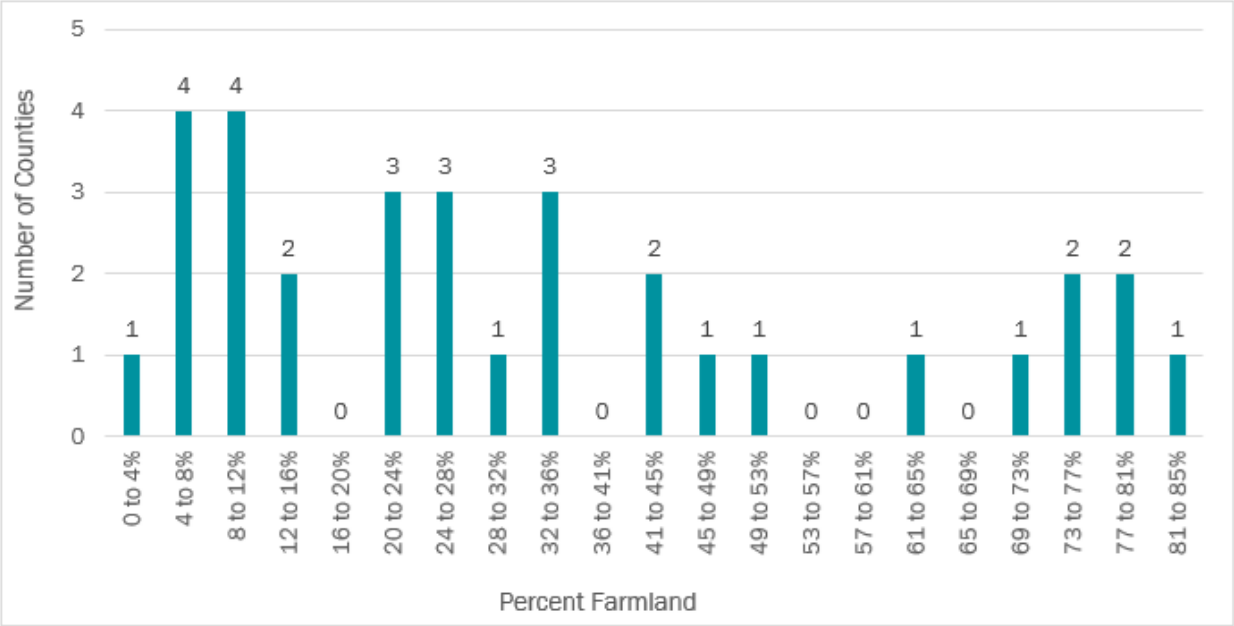

Figure 4-2. Percent of Land that is Farmland by County

Existing land use types, which are different from zoning, were analyzed using the National Land Cover Database (NLCD) and through a review of the State of Oregon's compiled zoning maps; however, not all communities report their zoning to the state database (U.S. Geological Survey [USGS] and Multi-Resolution Land Characteristics Consortium [MRLC] 2021, Oregon Spatial Data Library 2017). Land use types and development were analyzed within the six sub-study areas:

- Within the SFHA of the Oregon plan area
- Within 0.25-mile buffer around the SFHA
- Within UGBs
- Within 0.25 mile around UGBs
- Within the SFHA within UGBs
- Within 0.25 mile around SFHA within UGBs

The NLCD divides land into one of 15 different categories (MRLC 2024), which were condensed into nine categories for this analysis:

- Developed: Low-Intensity (as defined by NLCD category "Developed: Low-Intensity")
- Developed: Medium-Intensity (as defined by NLCD category "Developed: Medium-Intensity")
- Developed: High-Intensity (as defined by NLCD category "Developed: High-Intensity")
- Agricultural Land (composed of the NLCD categories "Cultivated Crops" and "Pasture/Hay")

- Forested Land (composed of the NLCD categories "Deciduous Forest," "Mixed Forest," and "Evergreen Forest")
- Wetlands (composed of the NLCD categories "Emergent Herbaceous Wetlands" and "Woody Wetlands")
- Open Water
- Open Space (areas with a mixture of constructed materials [less than 20 percent] and vegetation [often lawn grasses] includes large-lot single-family housing, parks, golf courses, and vegetation planted in developed settings and composed of the NLCD category "Developed Open Space")
- Natural Cover or Land (composed of the NLCD categories of "Barren Land" [rock, sand, clay], "Shrub Lands," and "Grassland")

As shown in Table 4.5, the existing levels of development are lowest in the SFHA at large (4.2 percent of total land) and highest in the UGB (56.9 percent). The level of development is even higher in the area just outside of the SFHA but within the UGB (62.3 percent in the UGB within 0.25 mile of the SFHA).

In summary, levels of development are generally lower in the SFHA than in areas just outside of the SFHA both inside and outside of UGBs. In the Oregon plan area as a whole, the SFHA has 4.2 percent developed land cover while the area within 0.25 mile of the SFHA has 8.9 percent developed land cover. Inside the UGB, the SFHA has 25.7 percent developed land cover while the area within 0.25 miles of the SFHA has 62.3 percent. The SFHA within UGBs is more developed than land outside of the UGB, which also reflects state policies to concentrate development in the UGBs. Land cover in the SFHA at large is dominated by agricultural lands (35.3 percent) and wetlands (22.3 percent). There is less agricultural land in the SFHA within UGBs (11 percent) than in the SFHA at large, but wetlands occur at approximately the same proportion (19.9 percent inside UGBs) in both areas.

Land cover, as represented by the NLCD data, shows existing land cover and land uses and does not reflect zoning or future plans or patterns. For example, land currently in forest cover or agricultural uses within a UGB that is zoned as industrial would be expected to be developed into an industrial land use in the future, consistent with its zoning.

Land cover categories that might be available for future development and thus most likely to be affected by the alternatives would include agricultural, forest, and natural land cover classes. Low intensity development converts to higher intensity uses over time and may require ground disturbing activities or trigger floodplain development permits. The open space category, as defined above, includes developed parks, golf courses, landscape vegetation in a developed setting, and thus some of this area may also be subject to future conversion to developed land cover types. Potential conversion would be guided by appropriate zoning, physical constraints of the land, and demand.

Table 4.5. Land Cover Within the Sub-Study Area

Land Cover Type	Land Cover Within the SFHA		Land Cover Within 0.25 mile of SFHA		Land Cover Within UGBs		Land Cover Within 0.25 mile of UGBs		Land Cover Within SFHA Within a UGB		Land Cover Within 0.25 mile of SFHA Within a UGB	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Developed – Low-Intensity	28562.8	2.4	133914.5	4.4	169067.2	22.2	17934.4	5.2	10368.4	11.4	67658.8	24.1
Developed – Medium-Intensity	14224.1	1.2	95518.1	3.1	187398.4	24.6	7289.0	2.1	7891.9	8.7	71547.9	25.5
Developed – High-Intensity	7294.4	0.6	41917.3	1.4	77798.5	10.2	2129.6	0.6	5119.5	5.6	35609.2	12.7
Developed Total[1]	**50,081.4**	**4.2**	**271,350.0**	**8.9**	**434,264.1**	**56.9**	**27,353.0**	**7.9**	**23,379.9**	**25.7**	**174,816.0**	**62.3**
Agricultural Land[2]	421,016.9	35.3	716,731.6	23.5	81,370.4	10.7	121,488.9	34.9	9,948.2	11.0	29,508.0	10.5
Forested Land[3]	70,344.7	5.9	859,821.1	28.2	62,405.4	8.2	68,327.0	19.6	2,011.5	2.2	20,606.3	7.4
Wetlands[4]	265,273.2	22.3	99,450.4	3.3	30,760.9	4.0	23,310.2	6.7	18,091.8	19.9	8,757.1	3.1
Open Water	238,251.7	20.0	68,489.4	2.2	29,227.3	3.8	32,913.7	9.5	24,721.7	27.2	2,291.3	0.8
Open Space[5]	38,222.2	3.2	151,220.7	5.0	78,265.1	10.3	21,569.6	6.2	8,970.8	9.9	30,968.3	11.1
Natural Land[6]	108,423.5	9.1	884,755.5	29.0	46,934.7	6.1	53,058.3	15.2	3,672.0	4.0	13,498.6	4.8
TOTAL	**1,191,622.6**	**100.0**	**3,051,818.6**	**100.0**	**763,227.9**	**100.1**	**348,020.6**	**100.1**	**90,795.9**	**100.0**	**280,445.6**	**100.0**

Source: USGS and MRLC 2021

Notes:

1. The category "Developed" includes three NLCD categories: "developed, low-intensity," "developed, medium-intensity," and "developed, high-intensity."

2. The category "Agricultural Land" includes two NLCD categories: "cultivated crops" and "pasture/hay."

3. The category "Forested Land" includes three NLCD categories: "deciduous forest," "mixed forest," and "evergreen forest."

4. The category "Wetlands" includes two NLCD categories: "woody wetlands" and "emergent herbaceous wetlands."

5. Although the NLCD name of this category is "Developed, Open Space," it is not considered to be a developed land category for this analysis because the impervious surface cover is less than 20 percent. Therefore, the labeling in the table has dropped the word "developed" from this label to avoid confusion.

6. The "Natural Cover and Land" category includes three NLCD categories: "barren land," "shrub/scrub," and "grasslands/herbaceous."

Key: SFHA = special flood hazard area; UGB = urban growth boundary

To identify past development patterns, NLCD land cover data from 2021 were compared to land cover data from 2011 to identify the amount of land that was converted to developed NLCD land cover types over the 10-year period. Table 4.6 summarizes the development that occurred within the sub-study areas between 2011 and 2021.

Table 4.6. Development Between 2011 and 2021 in the Sub-Study Areas within Oregon Plan Area

Sub-Study Area	Total Acres in Sub-Study Area in 2021	Acres Converted to Developed Land Uses Between 2011 and 2021	Percentage of Land in Sub-Study Area Converted to Developed Land Uses Between 2011 and 2021
SFHA	1,191,622.6	1,567.5	0.1
Within 0.25 mile of the SFHA	3,051,818.6	8,978.9	0.3
Total UGB	763,227.9	13,031.7	1.7
Within 0.25 mile of the UGB	348,020.6	1,422.2	0.4
SFHA within a UGB	90,795.9	484.5	0.5
Within 0.25 mile of the SFHA within a UGB	280,445.6	4,825.8	1.7

Source: USGS and MRLC 2011, 2021

As presented in Table 4.6, the change in the amount of land in developed land cover types between 2011 and 2021 was highest in the UGB, (increased by 1.7 percent). The amount of land that converted to developed land cover types between 2011 and 2021 was lowest in the SFHA as a whole (0.1 percent). During the same period, the proportion of the SFHA within a UGB that converted to developed land cover types was approximately 0.5 percent. This reflects the existing land use data and Oregon land use policies and laws that strongly direct development to areas within UGBs and incorporated city limits.

4.2.2. EXISTING CONDITIONS — DEVELOPMENT

Under existing conditions, continued development is expected to occur in the Oregon plan area based on the demand for new residential, commercial, and industrial facilities to support population and economic growth. Development would occur in accordance with state and local land use laws and regulations including comprehensive plans and zoning.

4.2.3. SIGNIFICANCE CRITERIA

There is the potential for significant impacts to occur when an alternative:

- Conflicts with local comprehensive plans and zoning ordinances or requires zoning adjustments
- Creates a need to expand UGBs based on factors other than population growth

4.2.4. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. Because implementation of the NFIP would remain unchanged, there would be no change in impacts on land use compared to existing conditions (Section 4.2.2). Because the No Action Alternative would not change impacts on land use compared to existing conditions, the NEPA finding is **no impact** compared to existing conditions.

4.2.5. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through a federal nexus, an existing HCP (under Section 10 of the ESA), or through an ESA Limit 4(d) approval. Section 3.3.4 provides additional information on project-specific ESA compliance.

A nexus is a connection or series of connections linking two or more things. A federal nexus indicates a relationship between a development and a federal environmental review (i.e., subject to federal laws and executive orders). A federal nexus occurs when a development includes federal funding, permits, licensing, approvals, or is otherwise completed by a federal agency.

Beneficial gain is part of the RBZ requirements, which account for the higher value of habitat for fish species in close proximity to waterways (see Section 3.3.1.4 for a complete description).

Implementing the no net loss standards would require some land in the SFHA to be used for mitigation (e.g., replacement flood storage, planting trees). This would reduce the amount of land available for development on the parcel being developed or could require another parcel in the SFHA to be used for mitigation. For example, in the Model Project A - Residential New Build scenario, a 1,500-square-foot home and 20-foot by 40-foot driveway could require a total mitigation area of approximately 0.26 acre.[23] The average residential lot size in urban areas in Oregon is approximately 0.17 acre (though parcel size varies depending on the community), thus a typical new single-family house could require a second parcel to implement mitigation for no net loss (Oregon Office of Economic Analysis 2018). While zoning may allow for project proponents to build taller structures with smaller footprints (i.e., same size of structure but smaller impact on floodplain functions), land for mitigation would still be required. The use of another parcel solely for mitigation is not likely to align with comprehensive plans, could conflict with zoning, and could make meeting state housing production goals more challenging (see Section 4.1.1.1 for additional information). As such, an individual development would have a **minor long-term adverse impact** on development and land use from the additional land required for mitigation. Impacts would **be significant** because land used solely for mitigation could conflict with local comprehensive plans and zoning.

[23] Additional land needed for mitigation could be reduced through methods such as underground storage tanks or use of low-impact development.

Alternative 2 could influence some development to move outside of the SFHA to avoid the cost and complexity of implementing the no net loss standards. According to the analysis in the *Economic Technical Report* (Appendix D), the increase in development costs due to the no net loss standards could range from a minor to a major impact, depending on the type of development. There is no way to predict how much development might move out of the SFHA owing to the increased cost of development from implementation of the no net loss standards. The types of developments that would be likely to experience higher proportional costs may also be large infrastructure projects that need to be in the SFHA to function (i.e., require proximity to water). If development were influenced to occur outside of the SFHA, it would be unlikely to be sufficient justification for a community to expand their UGB because a small percentage of development occurs in the SFHA compared to the rest of the UGB under existing conditions.

However, as discussed above, the additional land needed to implement mitigation in the SFHA could reduce the total developable land in the SFHA, thereby leading to a justification for a UGB expansion to accommodate projected growth sooner than planned. It is not possible to estimate the total amount of land in the Oregon plan area that could be used for mitigation in the SFHA because it would depend on the size of proposed developments, site-specific design decisions, siting plans, and the availability of on-site or off-site mitigation (which in turn affects the amount of land needed). However, Table 4.7 depicts the number of parcels that could be required over the next five years using residential building permit data for selected jurisdictions in the Oregon plan area and based on the mitigation required for Model Project A – Residential New Build.

Table 4.7. Anticipated Land Required for Mitigation in Select Counties Based on Residential Ground-Disturbing Permits from 2019–2023

County	Ground-Disturbing Permits in the SFHA[1]	Land Required for Mitigation[2]
Umatilla County	0	0.0 acre
Benton County	35	9.1 acres
Tillamook County	26	6.8 acres

Notes:
1. Based on data presented in Section 4.1.1.
2. Based on mitigation required for Model Project A – Residential New Build (0.26 acre); may or may not require a separate parcel depending on site-specific circumstances.

As with an individual development, the use of a site for mitigation may not align with comprehensive plans and could conflict with zoning. At the Oregon plan area scale, land used solely for mitigation could create challenges for communities in meeting housing demands by reducing the total developable land in the SFHA or necessitating that communities increase the density of housing

allowed under current zoning, which can be a lengthy administrative process but could be made easier through Oregon initiatives to increase density and middle-housing.[24]

Development with a federal nexus would be expected to obtain project-specific ESA compliance documentation; therefore, it would not be subject to the no net loss standards. Thus, the increased cost of implementing no net loss, and obtaining additional land area, would not hinder development with a federal nexus in the SFHA.

Therefore, at the community and Oregon plan area scale, Alternative 2 would have a **major long-term adverse impact** on land development and use from 1) the potential for some development to move outside of the SFHA because of increased costs for mitigation, 2) the use of land in the SFHA for mitigation thereby reducing development potential and potential increased need for UGB expansion. Impacts would **be significant** because of potential changes in development patterns outside the SFHA, use of land for mitigation could conflict with comprehensive plans and zoning, and UGB expansions may be needed based on reduced land availability.

4.2.6. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. This would result in a larger number of development projects implementing the no net loss standards.

Although FEMA does not have a statistically reliable estimate of the number of projects that would secure project-specific ESA compliance, estimates from the cooperating agencies indicate that approximately 16 percent of floodplain development permits may have Section 7 ESA compliance through other means (Section 3.4.1). Furthermore, the projects with project-specific ESA coverage are more likely to be infrastructure projects that would have a larger footprint than other types of developments (e.g., single-family home).

As with Alternative 2, Alternative 3 would not alter the type and rate of development throughout a community or within the Oregon plan area; however, it could reduce the total development potential in the SFHA because the additional land required to implement the no net loss standards may not be available for other development. This could create challenges in meeting state housing production goals if less developable land is available in the SFHA. Because Alternative 3 would apply the no net loss standard to development with project-specific ESA compliance, which may be likely to include larger infrastructure projects, an individual development could have a **moderate adverse impact** on local land use and development.

Under Alternative 3, developments that have obtained project-specific ESA compliance would be required to implement the no net loss standards. The cost of implementing the no net loss standards may make federal financial assistance more difficult to obtain when benefit-cost ratios are a

[24] Oregon House Bill 2001 allows middle housing defined in ORS 197.785 as duplexes, triplexes, quadplexes, cottage clusters, and townhouses, in areas previously restricted to single-family homes.

consideration of the federal funding agency. The inability to meet a favorable benefit-cost ratio could result in the denial of federal assistance for some projects, or this may result in communities incurring a larger percentage of the construction costs. While this is unlikely to make development with federal financial assistance infeasible, it could increase the complexity and cost for communities and may result in delays. In addition, increased project expenses would result in fewer projects able to be implemented, thereby diminishing the capacity associated with grant funding.

In addition, larger development and infrastructure projects would likely have larger footprints and require larger amounts of land to implement the no net loss mitigation. For example, Model Project B — Port Improvements, would require approximately 612,523 cubic feet (22,686 cubic yards) of soil to be removed from the SFHA to achieve no net loss of flood storage. Similarly, a project the size of Model Project B — Port Improvements could require up to 80 trees to be planted assuming the largest mitigation ratio and multiplier for off-site mitigation. This scale of project could require relatively large amounts of land in the SFHA of a UGB and lead to the need for a UGB expansion to accommodate growth more quickly than under Alternative 2. The use of land for no net loss mitigation, should it preclude development, could conflict with a community's comprehensive plan or zoning.

As with Alternative 2, Alternative 3 could influence some development decisions to move outside of the SFHA to avoid the cost and complexity of implementing the no net loss standards. There is no way to predict how much development might move out of the SFHA; however, as discussed in Section 4.1.1.3, developments with project-specific ESA compliance may be more likely to be large infrastructure projects that need to be in the SFHA to function (i.e., require proximity to water). For example, Model Project B – Port Improvements is water dependent (functionally dependent) and would be expected to obtain project-specific ESA compliance via USACE permitting processes.

Therefore, at the community and Oregon plan area scale, Alternative 3 would have a **major long-term adverse impact** on land development and use from: 1) the potential for some development to move outside of the SFHA (owing to increased costs for mitigation), 2) the use of land in the SFHA for mitigation, thereby reducing development potential and the potential increased need for UGB expansions to accommodate projected growth, and 3) the increased complexity, cost, and schedule to utilize federal financial assistance (i.e., benefit-cost ratio concerns). This adverse impact would be greater under Alternative 3 than under Alternative 2 because of the larger number of projects that would need to implement the no net loss standards in the SFHA. Impacts would **be significant** because a potential to influence development to occur outside the SFHA and use of land for mitigation could conflict with comprehensive plans and zoning and UGB expansions may be needed based on reduced land availability.

4.3. Economic Impacts

This section represents a summary of the potential economic impacts. For more information, please see the *Economic Technical Report* in Appendix D.

4.3.1. EXISTING CONDITIONS

As discussed in Section 4.2, the Oregon plan area encompasses over 90 percent of Oregon's population. The population of the Oregon plan area was almost 4 million in 2020, having grown by 1 percent annually since 2010 and is projected to increase by about 0.9 percent annually between 2020 and 2045.

Projected growth varies widely among counties. Some counties are projected to have growth up to 1.6 percent such as Deschutes County and Polk County, while others may experience a population decline of up to 0.4 percent, as is projected for Grant County. Oregon plan area housing units totaled 1.65 million in 2020, with about 88,000 units, or 5 percent, located in an SFHA (US Census Bureau 2020). At the community level, the percentage of housing units located in the SFHA ranged from zero percent up to about 91 percent, but the majority if NFIP participating communities have less than 9 percent of their total housing units in the SFHA (**Figure 4-3**) (US Census Bureau 2020).

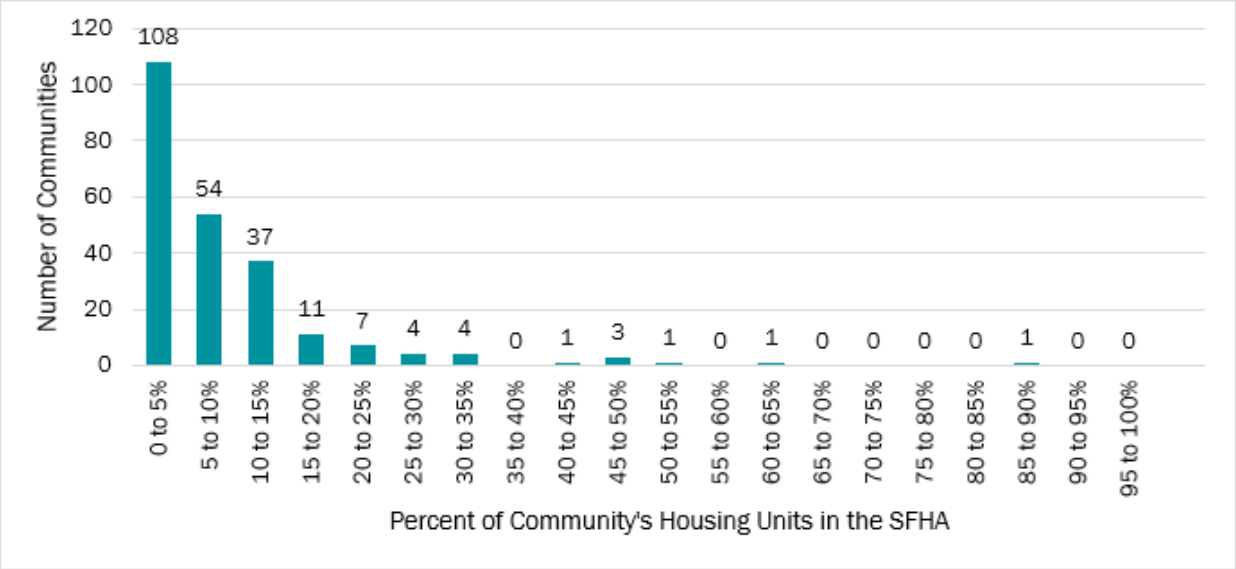

Figure 4-3. Percent of Housing Units in the Special Flood Hazard Area by Number of Communities

Between 2018 and 2022, residential building permits were issued for almost 60,000 new structures in the Oregon plan area counties, with a total construction value of about $22.1 billion.[25] During NEPA scoping, FEMA heard concerns about the potential for impacts from the no net loss standards on affordable housing in the Oregon plan area. Several state policies guide efforts to increase affordable housing. According to the Oregon State Housing Plan, "affordable housing" is defined as housing in which residents pay 30 percent or less of their gross income on housing (Oregon Housing and Community Services 2019-2023). A common standard for "affordable housing" is property that is made available to own or rent to families with incomes that are 80 percent or less of the area

[25] The value of residential building permits reflects the construction value, including materials, labor, utilities and associated construction needs; land values are not included in those estimates.

median income (State of Oregon 82nd Oregon Legislative Assembly 2024c, State of Oregon 82nd Oregon Legislative Assembly 2023, State of Oregon 81st Oregon Legislative Assembly 2021). Oregon SB 8, enrolled in 2021, requires local governments to allow development of certain affordable housing on lands not zoned for residential uses and allows establishment of certain affordable housing at an increased density (i.e., greater than the underlying zoning). Oregon HB 4143, enrolled in 2024, "requires the Oregon Business Development Department to provide grants to cities for specified infrastructure projects that will benefit housing developments that will make at least 30 percent of the dwelling units affordable to workforce income households" (State of Oregon 82nd Oregon Legislative Assembly 2024a).

The Oregon plan area economy also exhibits positive trends. Gross domestic product (GDP) has grown by 2.1 percent annually since 2018 within the plan area. Employment has grown by a rate of 1.7 percent annually since 2010 and is projected to grow by 1.0 percent per year through 2032. Median household income for Oregon plan area counties ranges from about $41,800 up to about $82,900, as compared to about $65,700 for the state as a whole. Economic conditions vary substantially from jurisdiction to jurisdiction in the Oregon plan area.

An examination of tax assessment lots classified as residential by county reveals that, on average in the Oregon plan area, about 6 percent are unimproved lots, while the remaining 94 percent are improved lots, presumably with houses, apartments, or modular units.[26] For individual counties, the percentage of unimproved residential lots ranges from about 3 percent (in Multnomah and Washington counties) up to about 34 percent (in Sherman County). For commercial and industrial lots, an average of about 17 percent are unimproved among the Oregon plan area counties. For individual counties, the percentage of unimproved commercial and industrial lots ranges from about 11 percent (in Clackamas and Marion counties) up to almost 100 percent (in Wheeler County).

In Oregon, a lot or parcel is a single unit of land. This EIS also uses the term property, which may include one or more lots or parcels. For example, one property under one owner may include two or more separate tax parcels.

Land value is the monetary worth of a piece of land and is often referred to as Real Market Value.[27] Land value is based on many factors, including the location, the potential for the land to be developed (e.g., topography, zoning), access (e.g., roads), geographic features (e.g., proximity to water), market trends, and utility availability.

[26] According to ORS 87.005, improvements include "any building, wharf, bridge, ditch, flume, reservoir, well, tunnel, fence, street, sidewalk, machinery, aqueduct, and all other structures and superstructures." In the case of residential properties, improvements are presumed to be structures that people use for the purpose of housing.

[27] As defined by the Oregon Department of Revenue, Real Market Value is "the amount in cash that could reasonably be expected to be paid by an informed buyer to an informed seller, both acting without compulsion in an arm's length transaction occurring as of the assessment date for the tax year."

4.3.2. IMPACT MAGNITUDE, INTENSITY, AND SIGNIFICANCE CRITERIA

FEMA evaluated the magnitude and intensity of potential economic benefits or adverse impacts based on the criteria shown in **Table 4.8**.

Table 4.8. Economic Impact Magnitude and Context Evaluation Criteria

Impact Scale	Criteria
No Impact	Economic impacts would not occur. No changes to existing conditions would be evident.
Negligible	Economic impacts would occur but would be only slightly detectable. For quantifiable economic resources, negligible impacts would amount to less than a 3 percent change to the existing condition.
Minor	Economic impacts would be noticeable to property owners or NFIP participating communities but could be accommodated without causing either property owners or NFIP participating communities to change courses of action, e.g. move or cancel development. For quantifiable economic resources, a minor impact would amount to a change of between 3 and 7 percent, as compared to the existing condition.
Moderate	Economic impacts would be challenging to accommodate. Moderate economic impacts might cause property owners or NFIP participating communities to modify courses of action. For quantifiable economic resources, a moderate impact would amount to a change greater than 7 percent and up to 12 percent, as compared to the existing condition.
Major	Major economic impacts would be very difficult for property owners or NFIP participating communities to absorb. Those affected parties would be likely to change courses of action. For quantifiable economic resources, a major impact would amount to a change greater than 12 percent, as compared to the existing condition.

The significance of economic impacts is generally evaluated by considering thresholds that would cause the affected party to at least consider pursuing different actions to avoid those economic impacts (e.g., not build the home, relocate the project out of the SFHA). However, the significance of economic impacts is dependent on individual financial capacity and economic circumstances. Therefore, moderate and major impacts are assumed to be significant; however, negligible and minor impacts may be significant to certain individuals or for certain developments.

4.3.3. IMPACTS COMMON TO ALL ALTERNATIVES

As discussed in Section 1.2, communities that participate in the NFIP obtain access to federally underwritten flood insurance and federal financial assistance. The economic benefits of community participation in the NFIP would continue under all alternatives.

The NFIP is designed to ensure that flood insurance is available to all property owners, businesses, and communities in flood-prone areas. The NFIP acts as an insurance company, setting its own

rates, performing its own underwriting, collecting premiums, and paying claims. FEMA sells insurance directly or through private companies under the "Write Your Own" program option.[28]

In addition to offering flood insurance, the NFIP administers the CRS, a voluntary incentive program that aims to reduce flood risk and promote community resilience by offering discounts on flood insurance premiums for participating communities. Under the CRS, communities that implement a series of floodplain management activities and initiatives beyond the minimum standards set by the NFIP receive flood insurance discounts tied to those efforts. Flood insurance rate discounts average 15 to 20 percent, but have reached as high as 40 percent for Salem, Oregon.[29]

The community measures undertaken to get the CRS insurance discounts have a corollary benefit to landowners, the community, and the federal government in that the risk of flood damage and resulting economic impact from floods are reduced.

Communities that participate in the NFIP are also eligible for federal financial assistance within the SFHA. FEMA provides financial assistance in areas deemed to have flood risks in order to reduce that risk or limit the damage future floods might cause to people, property, and structures. Notably, FEMA's HMA programs provide funding for eligible mitigation measures that reduce disaster losses. "Hazard mitigation" is defined as a sustainable action that reduces or eliminates long-term risk to people and property from future disasters.[30] FEMA offers the following HMA programs, which may be used to address flood risks:[31]

- *The Hazard Mitigation Grant Program (HMGP)* provides funding to eligible entities for the development of hazard mitigation plans and for rebuilding (after a major disaster) in a way that reduces, or mitigates, future natural disaster losses in their communities.[32] Hazard mitigation grants for projects sited within the SFHA are eligible only if the jurisdiction in which the project is located is participating in the NFIP.[33]
- *The Building Resilient Infrastructure and Communities (BRIC)* program supports states, local communities, Tribes, and territories as they undertake hazard mitigation projects to reduce the risks they face from future disasters and natural hazards.[34]

[28] Interview with Scott Van Hoff, FEMA, December 2023. The "Write Your Own" program is a cooperative undertaking between the insurance industry and FEMA, dating back to 1983. It involves private insurance carriers who issue and service NFIP policies.
[29] Op. Cit.
[30] https://www.fema.gov/grants/mitigation
[31] An additional HMA program is focused specifically on wildfire disasters.
[32] https://www.fema.gov/grants/mitigation/hazard-mitigation
[33] Non-participating communities may submit projects to the Hazard Mitigation Grant Program only if the projects are located in an unmapped area or areas outside the SFHA.
[34] The BRIC program is no longer implemented but data has been included to show the historical program funding in Oregon.https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

- *The Flood Mitigation Assistance (FMA)* program is a competitive program that provides funding for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the NFIP.[35]
- *The Pre-Disaster Mitigation (PDM) and Legislative Pre-Disaster Mitigation (LPDM)* grant program makes federal funds available to applicable entities to plan for and implement sustainable cost-effective measures designed to reduce the risk to individuals and property from future natural hazards, while also reducing reliance on federal funding from future disasters.[36]

In the State of Oregon, FEMA has spent more than $182.1 million related to flood events or flood risks through the HMA umbrella under various programs since 2012. **Table 4.9**. summarizes the available data describing the number of projects, federal expenditures by program, and total project costs associated with HMA program funding in Oregon since 2012.

Table 4.9. Historical FEMA Hazard Mitigation Assistance Program Funding in Oregon, by Program Type, Related to Flood Events and Flood Risk

Program Type (Fiscal Years)	Number of Projects[1]	Obligated Federal Cost Share[1]	Total Project Cost[1]
HMGP (2012 - 2023)[2]	78	$16,502,533	$21,792,917
BRIC (2019 - 2023)[3]	34	$142,238,132	$189,694,175
FMA (2014 - 2017)[4]	12	$4,220,919	$4,394,849
PDM / LPDM (2012 - 2024)[5]	38	$19,200,240	$34,593,579
Total	**162**	**$182,161,824**	**$250,475,519[6]**

Source: FEMA 2024; FEMA 2025.
Notes:
1. *Data is for the State of Oregon and is not restricted to the plan area or to the SFHA.*
2. *HMGP = Hazard Mitigation Grant Program. These projects are associated with disasters that include flooding.*
3. *BRIC = Building Resilient Infrastructure and Communities. The BRIC program is no longer implemented but data has been included to show the historical program funding in Oregon.*
4. *FMA = Flood Mitigation Assistance. All of these grants are related to flood mitigation.*
5. *PDM/LPDM are Pre-Disaster Mitigation and Legislative Pre-Disaster Mitigation. These grants include activities such as development of multi-hazard or multi-jurisdictional mitigation planning, which may include non-flood related risks.*
6. *More than $68 million of total Hazard Mitigation project costs (costs not covered by FEMA) were funded by state agencies, local jurisdictions or private entities during this period.*

Other FEMA programs also offer assistance to individuals, households, or communities responding to and recovering from disasters. The PA program is a supplemental grant program available to states, Tribal governments, U.S. territories, local governments, and certain private and non-profit organizations.[37] The PA program includes both emergency work and permanent work, with the latter unavailable to non-participants in NFIP. In the State of Oregon, FEMA has spent about $77.4 million through the PA program since 2014, related to flood events, as tabulated in **Table 4.10**.[38]

[35] https://www.fema.gov/grants/mitigation/flood-mitigation-assistance
[36] https://www.fema.gov/grants/mitigation/pre-disaster
[37] https://www.fema.gov/assistance/public
[38] FEMA typically offers a 75 percent cost share on approved projects.

Table 4.10. Historical FEMA Public Assistance Program Funding in Oregon, for Disasters Including Flooding Events

Disaster Number (Year)[1]	Number of Projects[2]	Obligated Federal Cost Share[2,3]	Total Cost of All Projects[2,3]	Average Federal Cost Share
4169 (2014)	50	$6,357,909	$8,265,008	77%
4258 (2015)	337	Data Not Available		
4296 (2016)	49	Data Not Available		
4328 (2017)	31	Data Not Available		
4432 (2019)	185	$31,280,555	$40,832,005	77%
4452 (2019)	77	Data Not Available		
4519 (2020)	76	$11,035,550	$14,215,600	78%
4599 (2021)	197	$26,096,931	$28,696,481	91%
4733 (2023)	16	$2,589,211	$3,407,951	76%
Total	**1,018**	**$77,360,155**	**$95,417,044[4]**	**81%**

Source: FEMA 2024.
Notes:
1. *Year refers to the year of the incident/disaster period. These disasters all include severe storms and flooding events.*
2. *Data is for the State of Oregon and is not restricted to the plan area or to the SFHA.*
3. *The obligated federal share is FEMA's portion of total project costs. Data for 2023 reflects best estimates of obligated federal costs and total project costs.*
4. *More than $18 million of total PA project costs (costs not covered by FEMA) were funded by state agencies, local jurisdictions or private entities during this period.*

The Individuals and Households Program (IHP) provides financial and direct services to eligible individuals and households affected by a disaster, who have uninsured or under-insured necessary expenses and serious needs.[39] In the State of Oregon, FEMA has spent more than $58 million on housing assistance and other assistance through the IHP since 2008, including about $8.6 million related to flood events.[40]

FEMA also administers other grant programs, including Preparedness grants and High Hazard Potential Dams grants. Preparedness grants help develop and sustain capabilities at the state, local, tribal, and territorial levels and in high-risk transit systems, ports, and along borders to prevent, protect against, respond to, recover from, and mitigate terrorism and other high-consequence disasters and emergencies.[41] The High Hazard Potential Dams grant program provides technical,

[39] https://www.fema.gov/assistance/individual/program
[40] FEMA. Data about historic IHP assistance in Oregon was only available for four disasters. The data does not include Real and Personal Property assistance, which is only available to NFIP participating communities.
[41] https://www.fema.gov/grants/preparedness/about

planning, design, and construction assistance for eligible rehabilitation activities that reduce dam risk and increase community preparedness.[42]

Besides investments and funding, FEMA also provides technical support related to flood management and planning. For instance, FEMA maps flood risk zones and periodically updates flood mapping. Additionally, the Community Assistance Program helps states proactively identify, prevent, and resolve floodplain management issues in participating communities before a flood event even occurs.[43] That program is funded by NFIP Federal Policy Fees, which are generated through NFIP insurance payments.

NFIP participating communities are also eligible for other federal agency financial assistance in the SFHA, including:

- HUD Community Development grants
- EPA revolving loans
- USDA Rural Development grants or loans
- Natural Resources Conservation Service (NRCS) financial assistance from the USDA
- U.S. Department of Transportation funding for highways and airports
- USACE Civil Works funds

Table 4.11 describes the type and amount of federal assistance provided by select federal agencies within the State of Oregon from 2020 through mid-2024.

[42] https://www.fema.gov/emergency-managers/risk-management/dam-safety/rehabilitation-high-hazard-potential-dams/resources

[43] https://www.fema.gov/floodplain-management/community-assistance-program

Table 4.11. Historical Federal Assistance Program Funding in Oregon, for Select Agencies, 2020–Mid-2024

Year[1]	HUD Community Development Block Grants	EPA Revolving Fund Grants[2]	USDA Rural Development Grants[4]	USDA NRCS Programs and Grants[5]	USDA Rural Development Loans
2020	$39,926,048	$32,427,000	$33,498,839	$41,441,232	$589,215,374
2021	$12,303,168	$32,439,000	$40,951,030	$47,295,370	$540,988,092
2022	$11,885,356	$32,423,000	$46,687,383	$41,447,623	$269,475,288
2023	$11,499,421	$22,291,000	$53,707,876	$51,224,062	$200,779,908
2024	$11,656,242	$29,635,000[3]	$52,478,644	$12,151,388	$73,636,244
Total	**$87,270,235**	**$149,215,000**	**$227,323,772**	**$193,559,675**	**$1,674,094,906**

Source: HUD 2024; EPA 2024; USDA 2024.
Notes:
1. *Data is for the State of Oregon and is not restricted to the plan area or to the SFHA.*
2. *Includes Clean Water State Revolving Fund Grants and Drinking Water State Revolving Fund Grants.*
3. *Data includes only Clean Water State Revolving Fund Grants.*
4. *Funding is provided through a variety of programs, including, but not limited to: Rental Assistance, Rural Business Development Grants, Repair Grants, Rural Energy Development Grants, Community Development Grants, and others.*
5. *Funding is provided through a variety of programs, mainly focused on the Environmental Quality Incentive Program and Conservation Innovation Grants.*

As shown in Table 4.9 to Table 4.11, participation in the NFIP provides a **significant economic benefit** through access to federally underwritten flood insurance and federal financial assistance in the SFHA.

4.3.4. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. Because implementation of the NFIP would remain unchanged, the significant economic benefit of the NFIP would remain for communities that participate, as discussed under impacts common to all alternatives (Section 4.3.3). These benefits include access to federally underwritten flood insurance, CRS insurance discounts, and certain federal financial assistance in the SFHA.

As discussed in Section 3.2, implementation of the NFIP in the Oregon plan area under the No Action Alternative would not include additional steps to address NMFS's 2016 determination that the continued existence of ESA-listed species and Southern Resident killer whale is likely to be jeopardized; designated critical habitat would be destroyed or adversely modified, and adverse effects on EFH would occur. Commercial and recreational fishing industries in Oregon may be adversely affected. In fact, some fisheries in Oregon are already at risk, as evidenced by recent Fishery Resource Disaster determinations, including those for Oregon Salmon Fisheries, 2018-2020

and Oregon Ocean Commercial Salmon Fisheries, 2023 (NOAA Fisheries 2025).[44] The extent of economic losses to Oregon's fishing industries attributable to the No Action Alternative is highly uncertain given the complex influences on those industries (including many that are outside of the Oregon plan area). Other influences on the fishing industry would include but are not limited to regional and foreign competition, operating margins, consumer preferences, and other regulations. Therefore, potential impacts on commercial and recreational fishing industries are not quantified in this Draft EIS.

4.3.5. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. Development with project-specific ESA compliance would not be subject to economic impacts of implementing the no net loss standards under Alternative 2.

As discussed in Section 4.3.3, the significant economic benefit of community participation in the NFIP would remain available. However, one potential outcome of Alternative 2 is that some jurisdictions currently participating in the NFIP would choose to withdraw from that program due to the additional costs and complexity (e.g., design, review, permitting) associated with the implementation of the no net loss standards. In those cases, communities and individual landowners would lose access to the economic benefits of the NFIP described in Section 4.3.3. The number of jurisdictions that might opt to withdraw from the NFIP in the face of the no net loss standards is unknown. However, given the benefits associated with the NFIP, the number would likely be small.

Landowners seeking to build on currently undeveloped parcels, redevelop or expand existing structures, or develop other amenities would be required to implement the no net loss standards. Achieving no net loss would occur through avoiding impacts on the three floodplain functions or by minimizing the degree or magnitude of impacts and offsetting any remaining impacts through mitigation. **Table 4.12** provides sample cost data for select mitigation measures applicable to new construction or redevelopment. The listed mitigation measures are not intended to represent all possible measures available for construction. These are assumed to be the minimum measures for compliance with the no net loss standards. Estimated costs reflect construction and materials costs for Oregon as of 2024 (Quarter 3).

Table 4.12. Estimated Costs of Select Mitigation Measures Identified to Meet the No Net Loss Standards

No Net Loss Standard / Mitigation Measure[1]	Estimated Cost
Flood Storage	
Cut and Fill[2]	$11 per cubic yard
Water Quality	

[44] For both disaster determinations, the cause of the disaster is listed as "natural causes."

No Net Loss Standard / Mitigation Measure[1]	Estimated Cost
Permeable Concrete	$12 per square foot
Permeable Asphalt	$10 per square foot
Vegetation	
Tree Planting (per Tree, Installed)[3]	$690
Shrubbery (per Shrub, Installed)	$57

Source: RS Means. Data are from 3rd Quarter 2024 for Eugene, Oregon.
Notes:
1. The listed mitigation measures are not intended to represent all possible mitigation measures.
2. Costs for cut and fill represent activity on flat ground.
3. Cost for a deciduous tree, balled and burlapped, 2.5-inch to 3-inch caliper, in prepared bed.

Actual costs would vary depending upon the SFHA location and site-specific characteristics, such as slope of the land, soil characteristics, or the property configuration. The specific mitigation measures identified above relate to on-site mitigation. If mitigation is proposed off-site, then the mitigation ratio required would double. Communities might also embark on larger mitigation projects to serve a larger portion of the SFHA (Path C). Some types of off-site mitigation measures might also be considered. For example, mitigation banking is a concept that might be considered by some communities. Mitigation banking for wetlands mitigation is already a relatively common practice; however, it remains difficult to put into place because of the high degree of required regulation and oversight.

4.3.5.1. Economic Impacts on Undeveloped Residential Land

There will be demand for future housing within the incorporated communities and unincorporated areas of the Oregon plan area based on population and economic growth factors. However, it is likely that the bulk of this demand can be met outside of the SFHAs, given past development patterns, existing zoning, and state initiatives to increase the density of housing, particularly within UGBs, and to address housing affordability (see Section 4.1.1.1 for additional information). For residential development occurring within the SFHA, an important issue would be the potential for economic impacts on owners of undeveloped land. The estimated increase in construction costs to develop Model Project A - Residential New Build would be 28.8 percent for off-site mitigation and 9.5 percent if mitigation occurred on-site.

Following the construction of a new home, fully mitigated for compliance with the no net loss standards, the homeowner would likely experience higher monthly payments compared with payments made on the same home without the mitigation. Assuming this residential landowner obtains a 30-year conventional mortgage at 6 percent, monthly principal and interest payments would be approximately $630 more per month or about $7,590 more per year (about 28.8 percent) in additional mortgage costs to implement the no net loss standards using off-site mitigation. This cost would occur in addition to the increase in construction costs. If mitigation occurred on-site, the homeowner would pay approximately $209 more per month or about $2,510 per year (about 9.5 percent).

Under Alternative 2, economic impacts would occur for those landowners and developers who elect to build in a manner that impacts at least one of the three floodplain functions. For many property owners, those economic impacts would be expressed in larger mortgage payments as discussed above. Residential developers would pass increased costs to home buyers who would then spend more on mortgage payments. With higher housing payments, owners would have less disposable income, and personal consumption expenditures would be less. Undeveloped residential land in the SFHA represents a small portion of undeveloped land in the Oregon plan area and residential construction on those lands is generally a small percentage of total residential construction in NFIP-participating communities as a whole. However, for some jurisdictions facing rapid growth and with developable land in the SFHA, these impacts would be larger.

The cost of implementing the no net loss standards may influence affordable housing developers to seek property located outside of the SFHA. Affordable housing developers may be faced with difficult decisions (e.g., site selection, balancing the cost of implementation of no net loss standards with land availability), which could prolong the timeline to achieve affordable housing goals. On the other hand, recent state legislation may address some of these potential impacts. For example, Oregon SB 8 allows affordable housing to be constructed on land not zoned as residential and at higher densities than the zoning allows. Oregon SB 1537 allows for a one-time UGB expansion to increase affordable housing, albeit with limitations. Based on available data, it is not possible to determine whether affordable housing would become concentrated in or avoid the SFHA. However, Alternative 2 would potentially influence the development of affordable housing, such as by increasing the cost and complexity of development, altering the location, or potentially delaying implementation of affordable housing projects. Under Alternative 2, affordable housing projects with federal funding, such as through HUD, would not need to implement the no net loss standards and would not be affected by the alternative.

For renters of single-family homes, increased costs associated with the no net loss standards would presumably be passed through to them to the extent landlords were able to do so. However, because the rental market is influenced by multiple factors beyond the implementation of the no net loss standards, the increase in single-family rental costs due to mitigation would likely be muted and partially absorbed by the landlord. Model Project A - Residential New Build may represent a large portion of new residential development expected in the SFHA; however, given the need for new housing in Oregon, additional multi-family developments are also likely to be constructed across the Oregon plan area.

Larger residential subdivisions, comprised of multiple single-family units along with parks, open space or other amenities, would also be required to meet the no net loss standards. Those types of developments might realize some flexibility with regard to mitigation measures and experience economies of scale with regard to mitigation costs, but the feasibility of individual projects would depend on a variety of financial factors.

The economic impact on residential parcel owners that choose not to develop would be the reduced property value, the lost benefit from the value added to the property after construction, or from the lost benefits of living in the dwelling once built. The extent to which property owners would forgo

development is unknown and the magnitude of losses to individual property owners would be site specific.

Given that the implementation of the no net loss standards is anticipated to raise the cost of new construction by about 9.5 percent assuming on-site mitigation up to 28.8 percent for off-site mitigation, there would be a **moderate to major adverse impact** on individual developers or property owners because it might lead them to at least consider pursuing different actions to avoid those economic impacts. However, given that on average only 6 percent of land in Oregon plan area counties is undeveloped residential property within the SFHA (ranging from 3 to 34 percent), a **negligible impact** on population and housing growth in NFIP communities is anticipated under Alternative 2. It is possible that some future residents might choose a different location in the community, if available, but overall growth would likely be unchanged.

4.3.5.2. Economic Impacts on Developed Residential Lands

Residential properties in the SFHA that are already developed with housing units, driveways, landscaping, and other structures or amenities make up, on average, 94 percent of residentially zoned acreage in the SFHA of Oregon plan area counties (ranging from 97 percent to 66 percent). Those properties would not be affected by implementation of the no net loss standards under Alternative 2 unless they are remodeled, redeveloped, or subdivided such that the footprint of the structures or associated amenities are expanded.

If a remodel were to occur, property owners and their architects and contractors could design the remodel in such a way that it maintains the same footprint. This might entail, for example, building a second story instead of expanding the ground floor footprint of a one-story house, if zoning allows. Otherwise, the owner and architect would need to implement no net loss mitigation measures. If existing SFHA homeowners want to add smaller appurtenances to their homes, they might face disproportionately higher mitigation costs because of diseconomies of scale. If a homeowner wanted to add a garage, carport, patio, paved driveway, or sidewalk, then the percentage increase in costs due to mitigation could be higher than the percentage increase calculated for a full single-family home development.

Under Alternative 2, it is possible that implementation of the no net loss standards might result in a somewhat positive impact on the property values of existing, fully developed residential properties in the SFHA. This would occur because the housing market in the SFHA could become fragmented into previously developed properties and new homes of comparable characteristics that cost more to build, given the implementation of the no net loss standards. A homeowner selling an existing home would face less price competition from the homeowners in the SFHA attempting to recover higher costs. This might provide the existing homeowner with price flexibility compared with a homeowner who paid for mitigating a house with similar characteristics. Of course, housing prices are influenced by numerous neighborhood and community factors.

4.3.5.3. Economic Impacts on the Commercial and Industrial Sector

Under Alternative 2, commercial and industrial development with project-specific ESA compliance would not be required to implement the no net loss standards. Therefore, under Alternative 2, those commercial and industrial projects would not incur any additional costs. For business ventures without a federal nexus, the choices these property owners make when faced with higher construction costs would determine the eventual economic impacts. Developed properties may have the opportunity to remain within the existing building footprint and avoid economic impacts.

Certain types of new, for-profit businesses would need to be located in the SFHA, including those that must have access to rivers or water bodies, and those that serve local neighborhoods. Both types would need to implement mitigation measures similar to those described for new residential development, which would raise the costs of construction by a similar estimated 9.5 to 28.8 percent. But unlike residential property owners, increased construction costs would increase the costs of doing business, raising the costs of goods or services sold. Businesses considering development in the SFHA might need to raise prices to maintain profit margins sufficient to justify development in the SFHA.

Tax deductions may limit the effect of these cost increases. Section 179 tax deductions under U.S. tax law allow for new investment in commercial construction to be deducted as an expense in the same year, or over a brief period of time if depreciation is the chosen deduction option.[45] If a business borrows the funds required for construction, that business can amortize the mitigation costs, along with the total construction costs, over 10 or more years. These accounting strategies would further reduce the negative impacts of mitigation costs under Alternative 2 on business profit.

Whereas certain businesses may need to be located within the SFHA, many others could be located elsewhere in the same community, if land outside the SFHA is available, or in other communities. Business owners of undeveloped commercial or industrial property in the SFHA would likely consider alternate locations if after-tax costs for building mitigation rise above the costs of alternate locations. However, the choice of building locations for commercial or industrial businesses is driven by a host of factors, including labor supply and costs, transportation access, and proximity to suppliers. Added costs associated with implementation of the no net loss standards would be unlikely to be the deciding factor in building location.

Previously developed commercial and industrial land would be impacted by the no net loss standards under Alternative 2 in cases of certain facility expansion, remodeling, or other development activities. Like similarly situated residential properties, those activities might require a different or more expensive design than required under current regulations to meet the no net loss standards.

[45] www.irs.gov

4.3.5.4. Economic Impacts on Farm and Forest Land

Under Alternative 2, owners of farm, ranch, and private forest land in the SFHA would incur economic impacts in implementing the no net loss standards to the extent that those property owners intend to develop in the SFHA. If development is required to support agricultural or forestry operations, economic impacts on property owners might be considerable because farmers, ranchers, or woodlot owners generally do not have the ability to raise prices, and profit margins are often slim for agricultural producers.

The added costs of mitigation may serve to discourage agricultural property owners from developing in the SFHA under Alternative 2. Although there is a considerable amount of farm and forest land in the SFHA of the Oregon plan area, no data are available to indicate the landowners' interest in or need to build on those lands. No data are available to indicate how critical such development might be to the overall farm or forest land operation or whether that development can be located in a non-SFHA portion of a given agricultural holding. Many agricultural operations in Oregon are located in the broad fertile floodplains of the Willamette Valley or in coastal floodplains. Property sizes are typically relatively large in agricultural and forest zones, and farm operations may include acreage both inside and outside the SFHA. Those landowners may have the opportunity to select building sites outside the SFHA, thereby avoiding mitigation requirements under Alternative 2. However, the location for an individual development may be constrained by operational considerations.

Model Project D - New Barn for Storage provides an example of one type of development that could occur on farm or forest land within the SFHA. The net mitigation costs for Model Project D - New Barn for Storage would increase the estimated project costs by approximately 12 percent. The model project represents a hypothetical example of one agricultural development project and is not meant to represent all new structural developments in the agricultural sector. Increases in mitigation costs for individual projects would vary based on factors such as site-specific construction and mitigation costs and the extent to which a property owner could avoid certain impacts, such as avoiding an increase of impervious surface area through the use of pervious materials.

4.3.5.5. Economic Impacts on Ports

Many construction projects within port boundaries would be expected to obtain project-specific ESA compliance because of the need for federal permits for in-water work or other federal financial assistance that would create a federal nexus. Under Alternative 2, those port projects would not be required to implement the no net loss standards. As discussed in Section 4.1, it is assumed that Model Project B – Port Improvement would receive project-specific ESA compliance through USACE permitting processes and thus would not need to implement the no net loss standards under Alternative 2.

However, a small number of port improvement projects might not obtain project-specific ESA compliance and would need to implement the no net loss standards, which would result in economic impacts. Because a port project without a federal nexus would most likely not be a project with in-water work, the economic impact would be similar to those described for the commercial and industrial sector above, with the notable exception that ports cannot relocate construction projects

outside the port boundaries. Therefore, options to move out of the SFHA and avoid impacts would be more limited for ports. Implementation of the no net loss standards would increase design and construction costs.

Funding for Oregon ports comes from fees, levies, special assessments, grants from other governmental entities, and debt financing. It is assumed that port projects without project-specific ESA compliance would be physically smaller (on average), and thus the increased cost might be met with a slight increase from one or several potential revenue sources. In sum, ports would likely experience adverse, but relatively limited, economic impacts under Alternative 2.

4.3.5.6. Economic Impacts on Public Lands, Including Recreational Areas

Existing facilities and infrastructure on public lands would not be affected by implementation of the no net loss standards. However, expansions and new projects planned or anticipated for the future would need to implement the no net loss standards under Alternative 2, unless project-specific ESA compliance is obtained through other means.

Potential future projects might include such facilities as roads, utilities, bridges, restrooms, or parking structures, and mitigation options would be similar to those described for residential or commercial developments. However, the scale and total cost of required mitigation could be quite different, depending on the scope of the project. State or local government planners may have the option of relocating facility projects out of the SFHA in at least some instances. When a facility must be built or expanded in the SFHA, implementation of the no net loss standards would raise construction costs for the project, regardless of whether it is a new development or redevelopment with an expanded footprint. Additional funding would need to be procured for state or local government projects on public lands; such mechanisms include bond issuances, taxes, fees, or appropriations. Increased costs may make funding support more difficult for certain new public projects.

Development for governmental enterprises such as public service organizations, schools, shelters, or community centers would also need to implement the no net loss standards and would face the added costs of mitigation. In general, these types of activities may have limited opportunities to increase revenues, and public agencies would either need to find additional monies in existing budgets or more likely, locate outside the SFHA, if land was available.

4.3.5.7. Public Sector Financial Impacts

Federal, state, and local governments would incur impacts from implementation of the no net loss standards under Alternative 2. Local governments that choose to continue to participate in the NFIP would need to consider whether their existing floodplain development ordinances adequately address the no net loss standards. It is likely that the majority of jurisdictions would need to supplement or change existing ordinances. Many county and municipal governments would incur additional costs as they implement new or updated ordinances and subsequent reporting requirements. Some NFIP-participating communities may need minimal or no ordinance revision or public process under Alternative 2, but others might need extensive public process to revise or

update ordinances. Larger communities with extensive undeveloped lands in rapidly growing communities, might need extensive public process (including public outreach, meetings, and hearings) and ordinance drafting sessions. Larger communities may require more effort than smaller ones, but the financial burden could be proportionally greater for smaller jurisdictions. To accomplish these tasks, some local governments may need to hire outside consultants or add personnel in-house (or both). The consultant cost, if this work were performed separately for each local government jurisdiction, might range generally from about $60,000 to more than $1 million for an individual jurisdiction.[46] Some participating communities might withdraw from the NFIP as a result of the proposed NFIP-ESA integration if they perceive widespread local resistance or determine they cannot meet the NFIP terms and conditions.

The specific path chosen would factor into the potential cost variation. On the low end of the range would be NFIP communities that select Path A or Path B, adopting the model ordinance or documenting compliance through existing ordinances. Under Path C and Path D, the local jurisdiction costs would be on the higher end of the range. These costs would include agency consultation, up to the development of an HCP under Path D. The development of an HCP under Path D would be undertaken by a community, county, or entity representing multiple parcels of land. The purpose would be to devise a holistic approach to meeting the no net loss standards and might include larger scale mitigation programs. The cost of preparing such a habitat conservation program would vary by project and location but could easily exceed several hundred thousand dollars and require multiple years to develop. Implementation costs could exceed several million dollars, depending on factors such as the scale of the plan and the specific actions taken during the implementation phase.

To help gauge the magnitude of this impact for the entire Oregon plan area, it is assumed that each of the 233 NFIP participating communities would spend an average of $100,000 to $200,000 to achieve initial adoption and implementation. Therefore, the total cost might total $23 million to $47 million for the full Oregon plan area. These estimated costs do not include increased staff time or training for permit review, which might be as much as 1 full-time equivalent position split among two to three people in the first year. Staff time would be much greater for local jurisdictions that take an active role in implementing the no net loss standards.

Annual costs of reporting would be separate from the initial adoption and implementation. It is assumed that local government staff would generally perform this task. This staff time would represent an additional cost to local governments. This would likely be less than 0.25 of a full-time equivalent per year. Of course, all these costs would vary by community. Factors would include the land uses and development interest in the SFHA, staff capabilities, existing ordinances, and community support.

In addition to the effects experienced by individual jurisdictions within the Oregon plan area, FEMA would experience financial impacts related to administration, management, and enforcement of the

[46] Based on discussions with consulting firms, including Stantec, AECOM, Logan Simpson, and Olsson and Merrick & Company, January 2024.

no net loss standards. Based on costs associated with other comparable efforts, FEMA anticipates the economic costs would reach $2 million over 2 years for the initial technical assistance, workshops, and other outreach.

City and county property tax revenues are determined by mill levies and property values. Mill levies are the tax rates applied to property values to determine property tax bills, which are one source of local government revenues. Mill levies would likely be unaffected by the implementation of the NFIP-ESA integration under the action alternatives because mill levies are typically for ongoing costs, such as bond repayment. This is consistent with Oregon tax law. Assuming mill levies would be unaffected, potential impacts of Alternative 2 on property revenues would stem from impacts on property values.

Property values might go down temporarily for certain property owners who choose not to develop, but these would likely be offset by those who do develop. With higher construction costs, property values, and thus property taxes, might increase. Generalized impacts on undeveloped SFHA property values would not likely be discernible because community-specific market forces within and outside the SFHA would drive those values.

The potential increase in construction costs could represent a stimulus, offsetting the effects of decreased spending from diminished disposable income available to individual homeowners. That is, greater spending for mitigation could become higher revenues for builders, equipment suppliers, and construction material providers. Depending on the location of those businesses, the economic stimuli can be regional, national, or international, compared with diminished consumer expenditures, which are largely regional. These expenditures could offset the reduced retail and service spending from impacted homeowners in the SFHA. Although this may be true in the aggregate, this would not help offset adverse effects on individual property owners. Jurisdictions facing rapid growth, with sizable amounts of undeveloped SFHA land and limited development options outside the SFHA, would experience greater economic impacts from implementation of the no net loss standards under Alternative 2 than communities with the opposite characteristics. The offsetting phenomenon of reduced disposable income and increased construction spending would still exist, but a greater number or higher proportion of negatively affected property owners would create economic stress in those jurisdictions.

4.3.5.8. Property Value

The cost of implementing the no net loss standards would increase the total cost of development and affect the associated value of a property. Using residential development as an example, this would occur because new homes of comparable characteristics would cost more to build in the SFHA versus outside of the SFHA. As costs for new development in proximity to existing homes rise, the fully developed properties would become more valuable. Similar effects would occur for non-residential property. In addition, as available space in the SFHA for mitigation becomes scarcer, the value of land would also rise. The magnitude of this gain is unknown. The increased value of land could be perceived as a benefit to landowners and communities that rely on revenues from property taxes based on land values, or it could be perceived as an adverse impact on those wishing to develop their land or purchase land within the SFHA.

4.3.5.9. Summary of Economic Impacts Under Alternative 2

For Alternative 2, potential economic impacts for an individual development would vary by land use. Potential impacts would occur on projects proposed on undeveloped lands and on developed properties that undergo building or infrastructure expansion, redevelopment activity, or other property improvements. Because of the site-specific and project-specific nature of future development in the plan area, it is not possible to quantify the total economic impacts.

Based on the cost of implementing the no net loss standards, impacts would range from **minor to major and be adverse** for undeveloped property while redevelopment could result in **no impact or a moderate adverse** impact. Residential, commercial, and industrial development is estimated to increase in construction costs by approximately 9.5 to 28.8 percent. Model Project D - New Barn for Storage provides an example of one type of development that could occur on farm or forest land within the SFHA and represent an estimated increase in construction costs of approximately 12 percent. However, the financial feasibility of any new development would vary by project, taking into account a variety of financial and other factors.

Developers in the SFHA would have less disposable income or profit, resulting in a **negligible to moderate adverse impact**. Property values might increase with higher construction costs, resulting in a **negligible to moderate beneficial effect** under most land uses but a **moderate adverse impact** for large commercial and industrial projects compared to the No Action Alternative.

Under Alternative 2, local governments would incur increased costs in complying with the implementation and administration of the no net loss standards. The potential costs to local governments would range from **minor to moderate** and would vary depending on the path chosen. In addition to the effects experienced by individual jurisdictions within the Oregon plan area, FEMA would experience financial impacts related to administration, management, and enforcement of the no net loss standards.

For communities and the Oregon plan area as a whole, the potential increase in construction costs would represent a stimulus that may offset the effects of diminished disposable income, and property taxes would likely increase eventually. This would result in a **negligible beneficial effect** compared to the No Action Alternative. However, impacts on GDP would occur and would be **negligible and adverse,** except for public lands, which could be **minor and adverse**.

As discussed in Section 4.3.2, economic impacts would be significant if they would cause the affected party to at least consider pursuing different actions. Moderate and major impacts are assumed to be significant; however, negligible and minor impacts may be significant to certain individuals or for certain developments. As such, impacts under Alternative 2 would **be significant** because affected parties may consider pursuing actions such as locating development outside of the SFHA and some development within the SFHA could experience moderate adverse impacts.

4.3.6. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. As described in 4.1.1.3, FEMA assumes that approximately 16 percent of SFHA development may have project-specific ESA compliance.

Potential economic impacts would not vary between Alternatives 2 and 3 for most projects. Most residential projects, small commercial and industrial projects, agricultural developments, or development on state or local government lands would be unlikely to have a federal nexus for ESA compliance, and thus there would be no difference in potential impacts between Alternative 2 and Alternative 3. Impacts for these types of projects would generally be negligible to major and adverse, including potential construction cost increases up to 28.8 percent.

However, for developments with project-specific ESA compliance, there would be substantial differences in potential economic impacts between Alternatives 2 and 3. Under Alternative 3, those projects would incur the costs resulting from implementing both measures identified in project-specific ESA compliance documentation and the no net loss standards. Project-specific ESA compliance measures could include activities such as adhering to timing restrictions on construction (e.g., time of day or time of year restrictions), installing habitat enhancements for specific species (e.g., transparent panels along a wharf edge to allow light to reach the water below, adding substrate material in the water suitable for juvenile fish or large woody material), performing biological surveys and monitoring, using bubble curtains or specialized erosion control measures, or other compensatory mitigation. The prospect of these combined mitigation costs could encourage some developers to locate their projects out of the SFHA, perhaps even out of the community, or to not move forward with the project. Such projects could include commercial, industrial, port, or public projects that are typically larger, as well as those with a federal nexus. Negative impacts from diminished economic activity would follow that could affect the community as a whole.

FEMA's Model Project B – Port Improvements offers an example of one type of development that would reasonably be expected to obtain project-specific ESA compliance and also be subject to the no net loss standards under Alternative 3. The estimated mitigation costs required to meet the no net loss standards for Model Project B – Port Improvements would amount to about $718,235 or an increase of about 2.6 percent. The *Economic Technical Report,* Appendix D, contains a detailed description of cost assumptions.

Assuming bond financing (a term of 10 years and an interest rate of 3.5 percent), annual payments for Model Project B – Port Improvements would increase from about $3.3 million per year to about $3.4 million due to the mitigation activities necessary to implement the no net loss standards.[47] Mitigation costs for projects located within ports would likely be amortized into bond financing, reducing annual effects. Fees or levies might need to be raised. The economic impacts of

[47] The interest rate for the port project is based on the yields for municipal bonds from the 20-bond index for the U.S., obtained from the Federal Reserve of St. Louis, October 2024.

incorporating mitigation measures into development would negatively affect ports, which must be competitive with other ports both in and outside the Oregon plan area to remain viable. If a port becomes less competitive, it is likely to lose market share and declines in revenues would further threaten operations. Costs would be passed along to port customers or financial margins would shrink. Higher costs could drive businesses and activity within port districts to alternative locations outside Oregon. Loss of any business activity within ports in the Oregon plan area would result in a reduction of the statewide economic benefits currently generated by ports.

Under Alternative 3, implementation of the no net loss standards could result in an increase in the amount of time required to secure permits and other environmental approvals as there would be more ground disturbance to implement no net loss mitigation requiring additional review by permit and approval agencies with associated costs to both the development and the local, state, and federal agencies. In addition, costs associated with the no net loss standards would be additive to the project-specific ESA compliance costs. This increase in cost could be incurred by any funding partner, which could impact federal agency cost shares and reduce the number of projects that might be able to receive financial assistance. Ports and other developers (including agencies) with project-specific ESA compliance might not be able to fund the increased costs, or project schedules might not be able to accommodate timelines to secure environmental approvals, in which case the projects might be cancelled. Ports cannot relocate construction projects outside the port boundaries and many types of projects with a federal nexus would likely be dependent on a location in the SFHA or near water for their function.

The extent to which Model Project B – Port Improvements represents development with project-specific ESA compliance is unknown. Project-specific ESA compliance may also be obtained for commercial, industrial, or public land developments. For commercial, industrial, and public projects, the prospect of meeting project-specific ESA compliance-related mitigation and also implementing the no net loss standards might be discouraging to commercial ventures. Re-location of the project outside the SFHA or the community is possible when the project is not SFHA-dependent. The potential negative economic impacts of Alternative 3 would thus be greater than Alternative 2, owing to additional lost economic benefits of construction and economic activity.

Alternative 3 would have an adverse impact on the production of affordable housing in the SFHA where such projects include federal assistance such as funding through HUD. Similar to the port project described above, an affordable housing project would face increased costs for no net loss mitigation, longer permitting or approval timelines. Increased costs per project might result in fewer projects receiving federal assistance.

Under both Alternative 2 and Alternative 3, local governments would incur increased costs to implement and administer the no net loss standards. In some cases, the costs to local governments could be substantial and would vary depending on the path chosen. The potential costs to local governments would be approximately the same as under Alternative 2. As with Alternative 2, FEMA would experience financial impacts related to administration, management and enforcement of the no net loss standards.

Under Alternative 3, most economic impacts on property values as well as state and local governments would be the same as those described for Alternative 2, except for the lost economic benefits associated with those projects with ESA compliance. Those lost benefits could be from cancelled or re-located commercial, port, or public sector projects. The magnitude of the differences cannot be estimated; however, given that the additional projects affected under Alternative 3 would typically be larger projects with broader community-level potential benefits, the lost benefits could be considerable even if the number of projects is small.

4.3.6.1. Summary of Impacts Under Alternative 3

For Alternative 3, potential economic impacts for an individual development would vary by land use. Impacts would occur on projects proposed on undeveloped lands and on developed properties that undergo building or infrastructure expansion, redevelopment activity, or other property improvements. Because of the site-specific and project-specific nature of future development in the Oregon plan area, it is not possible to quantify the total economic impacts. Based on the cost of implementing the no net loss standards, potential impacts would range from **minor to major adverse** for undeveloped property while impacts would generally be **negligible to minor adverse** for redevelopment. In contrast to Alternative 2, Alternative 3 could have a **major adverse** impact on large commercial, port, and public lands projects. The degree to which large commercial, ports, or public lands projects would be impacted more adversely under Alternative 3 as compared to Alternative 2 would depend on whether or not they have project-specific ESA compliance. Developers in the SFHA would have less disposable income or profit, resulting in **negligible to moderate adverse** impact. Property values might increase with higher construction costs, resulting in a **negligible to minor beneficial effect** under most land uses up to a **moderate beneficial effect** to port and public land projects compared to the No Action Alternative. However, **moderate adverse impacts** could occur for large commercial and industrial projects.

Under Alternative 3, local governments would incur increased costs in complying with the implementation and administration of the no net loss standards. The potential costs to local governments would be a **minor to moderate adverse impact** and would vary depending on the path chosen. For communities and the Oregon plan area as a whole, the potential increase in construction costs would represent a stimulus that may offset the effects of diminished disposable income and property taxes would likely increase. This would result in a **negligible to minor beneficial effect** on most land uses and up to a **moderate beneficial effect** for port projects compared to the No Action Alternative. Impacts on GDP would be more severe than under Alternative 2 and may be **major adverse impacts** related to the economic value of ports.

As discussed in Section 4.3.2, economic impacts would be significant if they would cause the affected party to at least consider pursuing different actions. Moderate and major impacts are assumed to be significant; however, negligible and minor impacts may be significant to certain individuals or for certain developments. As such, impacts under Alternative 3 would **be significant** because affected parties may consider pursuing actions such as locating development outside of the SFHA and some development within the SFHA could experience major adverse impacts.

4.4. Seismicity, Geology, Topography, Soils

Seismicity is the occurrence or frequency of earthquakes in a region. An earthquake can result in ground shaking, surface fault rupture, soil liquefaction (i.e., when saturated soils destabilize and act as a liquid in response to ground shaking), landslides, tsunamis, or a seiche. Geology is the earth's physical structure and substance, including its history and processes. Topography is the shape of the earth's surface, and soil is the loose surface material (e.g., dirt) that covers most land.

The Oregon Structural Specialty Code (OSSC), which preempts local ordinances and rules (ORS 455.040), establishes minimum requirements for the construction, reconstruction, alteration, and repair of buildings and other structures. The OSSC and the 2023 Oregon Residential Specialty Code (ORSC) incorporate safety requirements for structures subject to seismic and tsunami risk. In addition, ORS 455.447 regulates major structures vulnerable to earthquakes and tsunamis.[48] Chapter 632 of the OAR defines the tsunami inundation zone and requires consultation with the Oregon Department of Geology and Mineral Industries (DOGAMI) for all new construction of or conversion to essential facilities, hazardous facilities, major structures, or special occupancy structures within the tsunami inundation zone.

The OSSC requires geotechnical investigations (soil investigations) for development to classify soils and to evaluate slope stability, soil strength, adequacy of load-bearing soils, and the potential for soil compression, liquefaction, and expansiveness.[49] The purpose of geotechnical investigations is to determine how a site will support a proposed development and affect nearby development. The OSSC also includes specifications for excavation, grading, and fill to avoid erosion or destabilization of the land to maintain the stability of structures.

The OSSC is generally applicable to commercial development that requires a building permit, as specified by a local community. Typical actions exempt from the OSSC include fences constructed of wood, wire mesh, or chain link, and signs not attached to a building that would not result in safety hazards to people or structures. Any building permit in the SFHA will require a floodplain development permit (and thus be subject to the alternatives). However, not all actions requiring a floodplain development permit will require a building permit (and thus be subject to the OSSC). The ORSC is generally applicable to residential dwellings three stories or less above grade.

4.4.1. EXISTING CONDITIONS

Oregon's landscape was shaped over time by tectonic plates, volcanic activity, waterways and floods, landslides, and fires (DOGAMI 2024). Oregon remains a seismically active area, primarily as a result

[48] ORS 455.447 defined major as a building over six stories in height with an aggregate floor area of 60,000 square feet or more, every building over 10 stories in height and parking structures as determined by Department of Consumer and Business Services rule.

[49] Exceptions to a geotechnical investigation can be made by the building official when satisfactory data from adjacent areas are available and demonstrate an investigation is not necessary.

of the Cascadia Subduction Zone located offshore of the Pacific coastline. Earthquakes, and associated tsunamis, occur most frequently in the western part of Oregon.

DOGAMI identifies nine geologic provinces in Oregon, seven of which are located within the Oregon plan area. From west to east, the provinces include the Coast Range, Klamath Mountains, Willamette Valley, Cascade Mountains, Deschutes Columbia Plateau, High Lava Plains, and the Blue Mountains, see Table 4.13.

Topography across the Oregon plan area ranges from 0 feet at the coast in the Coastal Range province up to 11,040 feet in the Cascade Mountains (ODFW 2016). Soil types also vary across the Oregon plan area. The Klamath Mountains province contains soils rich in heavy metals that support some of the most diverse plant communities in the world (ODFW 2016). The Willamette Valley contains rich alluvial deposits that support modern-day agricultural production (DOGAMI 2024). The varied historic geologic processes and resulting topography across the Oregon plan area similarly results in varied floodplain characteristics. Some floodplains are narrow, weaving between steep mountain or hillside slopes, while others are broad and wide, encompassing large portions of river valleys.

Table 4.13. Geologic Provinces and Characteristics in the Oregon Plan Area

Geologic Province	Geology	Topography	Soils	Generalized Floodplain Characteristics
Coastal Range	Volcanic chain, stacks of sedimentary rock	0 to 4,100 feet	Sand, gravel, dirt, volcanic ash, and mud	Steep and narrow; wider toward coast
Klamath Mountains	Metamorphic and igneous rock	600 to 7,400 feet	Soils rich in heavy metals	Steep and narrow
Willamette Valley	Superficial deposits and volcanic sediments	4 to 780 feet	Rich deposits that support modern-day agricultural production	Broad floodplains and wide river valleys
Cascade Mountains	Pumice, lava, tuff, and interlayered river and lake sediments	70 to 11,040 feet	Sediment and silt	Steep and narrow
Deschutes Columbia Plateau	Basalt	100 to 3,000 feet	Silt and sand, rich soil that supports modern-day agriculture	Steep and narrow
High Lava Plains	Basalt	2,070 to 9,733 feet	Volcanic sediment	Steep and narrow (within Oregon plan area)

Geologic Province	Geology	Topography	Soils	Generalized Floodplain Characteristics
Blue Mountains	Exotic terranes (e.g., limestone, serpentinite)	1,000 to 9,838 feet	Sediment and silt	Steep and narrow; some wide high-elevation floodplain

Source: DOGAMI 2024, ODFW 2016, FEMA 2024a

4.4.2. EXISTING CONDITIONS — DEVELOPMENT

Under existing conditions, application of the OSSC, ORSC, and ORS 445.447 would confirm that proposed developments incorporate safety requirements for seismic and tsunami risks, as applicable. Development would not alter the occurrence or frequency of earthquakes, which are based on tectonic plate activity, nor would it alter the hazards that occur as a result of an earthquake (e.g., soil liquefaction, landslides, tsunamis, seiches). Development would not alter the geologic processes in Oregon. Development may occur on bedrock in some provinces because soil depths are limited (e.g., High Lava Plains). However, application of the OSSC and ORSC would ensure that development impacting bedrock meets structural design criteria. These building codes are applied to development of buildings and structures throughout the Oregon plan area, regardless of whether they are or are not within the SFHA.

Under existing conditions, development in the SFHA would likely alter the existing topography of at least a portion of each site from grading; however, this would not alter the topography of adjacent sites. The OSSC includes requirements for excavation, grading, and fill to avoid erosion or destabilization of the land in order to maintain the stability of structures but does not apply to all SFHA development. Development would disturb soils from temporary activities such as grading, which would increase the risk of erosion. However, geotechnical investigations would occur for development subject to the OSSC to confirm the stability of the landscape is not impaired. In addition, most developments would comply with state and local regulations to prevent disturbed soils from being carried off-site.

4.4.3. SIGNIFICANCE CRITERIA

An evaluation of impacts related to seismicity, geology, topography, and soils involves a comparison of current and future conditions, and the extent to which the alternatives might alter the current conditions. A significant impact on seismicity, geology, topography, and soils would occur when an alternative would:

- Increase vulnerability to damage from seismic or tsunami events
- Increase erosion or alter topography beyond the effects reasonably expected from development under existing conditions such that landscape stability is impaired

4.4.4. IMPACTS COMMON TO ALL ALTERNATIVES

None of the alternatives would alter the amount or anticipated rate of development across the state, which is driven by population change and economic growth factors (Section 4.1.1.1). As described in Section 4.2, continued development in the SFHA is anticipated in NFIP participating communities under all alternatives. As discussed under existing conditions (Sections 4.4.1 and 4.4.2), all alternatives would be subject to existing regulations related to seismicity, geology, topography, and soils. Application of the OSSC, ORSC, and ORS 445.447 would confirm that proposed developments incorporate safety requirements for seismic and tsunami risks as under existing conditions. Therefore, all alternatives would have **no impact** related to seismicity. All alternatives would have **no impact** on geology because they would not alter the geologic processes in Oregon and would not alter the potential for development to occur on bedrock.

4.4.5. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. Because implementation of the NFIP would remain unchanged, there would be no change in impacts on topography and soils as compared to existing conditions (Section 4.4.2). Because the No Action Alternative would not change impacts related to topography and soils compared to existing conditions, the NEPA finding is **no impact** compared to existing conditions.

4.4.6. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. Impacts for development with project-specific ESA compliance would be similar to those described for an individual development under existing conditions. Development without project-specific ESA compliance would implement the no net loss standards.

Implementation of no net loss of flood storage capacity would include removing soil from the SFHA to create replacement flood storage to offset the placement of fill and structures in the SFHA. For example, in the Model Project A - Residential New Build scenario, a 1,500-square-foot home and 20-foot by 40-foot driveway would require 3,400 cubic feet of soil (126 cubic yards) to be removed from the SFHA for replacement flood storage. For reference, a dump truck carries an average of 10 cubic yards of material (**Figure 4-4**). If the developer of Model Project A - Residential New Build had to find an off-site location for the mitigation, the project would be subject to larger mitigation ratios and might have to remove up to 6,800 cubic feet of soil (252 cubic yards). Removing this amount of soil would alter topographic contours. Replacement flood storage sites

Figure 4-4. Visual Representation of 10 Cubic Yards of Material

would be revegetated with non-invasive species or crops. The removal of topsoil to create replacement flood storage would likely affect soil productivity, which may make revegetation more difficult or require more time to become established. The longer soils are exposed, the more likely it is that erosion may occur, further affecting soil productivity. This would increase the risk of erosion compared to existing conditions (and therefore the No Action Alternative) in the short term. However, once established, vegetation would reduce the risk of erosion in the long term. With implementation of the no net loss standards, the soils removed to create replacement flood storage would need to be disposed of outside the SFHA, thereby altering topography both at the mitigation site and the soil disposal site.

Temporary soil disturbance would also occur to create no net loss of pervious surface and trees. In the long term, maintaining pervious surface would support the natural process of stormwater infiltrating into the ground, thereby reducing the potential for altered flow patterns from development (e.g., changes in depth, volume, and velocity) and associated erosion of soils. Implementation of the no net loss standard for trees would require either avoiding impacts on trees or replanting a minimum of two trees (up to 12 trees) per tree removed, depending on the location of the new planting site. This could result in an increased number of trees in the long term should more than one replacement tree for every one removed grow to maturity; however, not all planted trees would be expected to survive to maturity. As trees grow to maturity, this would maintain and could improve the stabilization of soils in the SFHA as compared to the No Action Alternative where the no net loss mitigation ratios for trees would not be implemented.

Therefore, an individual development under Alternative 2 would have a **minor short- and long-term adverse impact** on soils and topography from requiring the removal of soils in the SFHA for replacement flood storage capacity, which would alter the topography of both the mitigation site and the soil disposal site. Adverse impacts on soils and topography would **not be significant** because no net loss would require planting vegetation where soils were removed for replacement flood storage, thereby reducing the risk of eroded soils that could destabilize the land in the long term. In addition, an individual development under Alternative 2 would have a **negligible long-term beneficial effect** compared to the No Action Alternative by decreasing the risk of erosion associated with reductions of pervious surface area and by replacing trees removed by development resulting in maintenance of soil stability.

The amount of residential and commercial development in the foreseeable future is expected to remain the same or be slightly less than occurred annually between 2010 and 2020. It is reasonable to expect the number of permits issued annually would remain approximately the same moving forward. However, the cost of implementing the no net loss standards could influence some developers to move projects outside of the SFHA (Section 4.2.5).

Section 4.2.1 presented the number of residential and commercial permits for development in the SFHA between 2019 and 2023 for three counties within the Oregon plan area. **Table 4.14** depicts the amount of soil that could be moved outside the SFHA over 5 years to achieve no net loss of flood storage capacity using these three counties as an example. These calculations use Model Project A - Residential New Build as the basis for residential development and Model Project C - Existing Parking

Lot to Large Building as the basis for commercial development. Both scenarios assume that the potential developments would not choose to move out of the SFHA.

Table 4.14. Potential Removal of Soil from the SFHA for No Net Loss of Flood Storage

County	Number of Residential Permits 2019 to 2023	Cubic Yards of Soil Potentially Moved Over 5 Years [1]	Number of Commercial Permits 2019 to 2023	Cubic Yards of Soil Potentially Moved Over 5 Years [2]	Total Cubic Yards of Soil Potentially Moved
Umatilla County	0	0.00	1	349	349
Benton County	35	8,820	8	2,729	11,549
Tillamook County	26	6,552	5	1,745	8,297

Source: ACCELA 2024
Notes:
1. Assumes 6,800 cubic feet (252 cubic yards) replacement flood storage per residential permit, based on Model Project A - Residential New Build.
2. Assumes 9,412.5 cubic feet (349 cubic yards) replacement flood storage per commercial permit, based on Model Project C - Existing Parking Lot to Large Building.

The movement of soil would alter topography at both the replacement flood storage site and the soil disposal site. At the Oregon plan area scale, topographic changes would be nondetectable or slight. Replacement flood storage must be created at a hydrologically equivalent elevation that avoids fish stranding (i.e., avoids deep depressions and mounding). As such, topographic changes associated with replacement flood storage are expected to be slight. For example, 6 inches of soil removed over a 13,600-square-foot area would create the 6,800 cubic feet [252 cubic yards] of replacement flood storage required for Model Project A - Residential New Build. As discussed above, the replacement flood storage site would be revegetated. While soil erosion may increase in the short term while vegetation establishes, mature vegetation would reduce the risk of erosion in the long term. As with an individual development, the total pervious surface area would be maintained, reducing the risk of erosion from stormwater runoff.

There would be a beneficial effect on soil stability compared to the No Action Alternative from the replacement trees that grow to maturity. However, trees take time to become established, and other types of vegetation (such as grasses) are more effective at quickly providing soil stability. Trees provide deeper stability that helps to reduce larger movements of soils such as in a landslide. The implementation of no net loss standards would only replace trees, although the development may remove other types of vegetation as well. With implementation of the no net loss standards, the number of trees in the SFHA could reasonably increase and result in more stable soils, particularly if trees were planted in areas of finer soils or along slopes. Therefore, at the Oregon plan area scale, Alternative 2 would have a **minor short- and long-term adverse impact** on soils and topography from requiring the removal of soils in the SFHA for replacement flood storage capacity, which would alter natural contours, could make revegetation more difficult, and increase the risk of erosion in the short term. Impacts would **not be significant** because replacement flood storage sites would be revegetated and pervious surface would be maintained, which would reduce the risk of erosion in the

long term. In addition, Alternative 2 would have a **negligible long-term beneficial effect** compared to the No Action Alternative by decreasing the risk of erosion associated with reductions of pervious surface area and by replacing trees removed by development, resulting in maintenance of soil stability.

4.4.7. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. This would result in a larger number of development projects implementing the no net loss standards than under Alternative 2.

Although Alternative 3 would require no net loss for development with project-specific ESA compliance, impacts from an individual development would be localized as with Alternative 2. Therefore, impacts on soils and topography from an individual development under Alternative 3 would remain as described under Alternative 2.

As discussed in Section 4.2.6, FEMA anticipates that 16 percent of SFHA development would have project-specific ESA compliance. Furthermore, the projects with project-specific ESA coverage would likely be larger projects or infrastructure projects. Therefore, the projects that would need to implement the no net loss standards under Alternative 3 (but not under Alternative 2) would have larger impacts on topography due to replacement flood storage requirements and potentially provide greater long-term benefits from replacement trees that survive to maturity.

For example, Model Project B - Port Improvements would be expected to obtain a Section 404 CWA permit, which may include project-specific compliance with the ESA; however, it would also still be required to implement the no net loss standards under Alternative 3. Model Project B - Port Improvements would require approximately 612,523 cubic feet (22,686 cubic yards) of soil to be removed from the SFHA, which would then need to be disposed of in another location. Model Project B - Port Improvements would require 40 trees to be planted.

When considering impacts across the Oregon plan area, Alternative 3 would have a **moderate short- and long-term adverse impact** on soil and topography from the increased ground disturbance associated with the no net loss standards. Although replacement flood storage would be required for more developments than under Alternative 2, topographic changes would be expected to be slight because of the requirement for replacement flood storage to be hydrologically equivalent to the flood storage that was lost. The risk of erosion would increase in the short term while vegetation becomes established. Impacts **would not be significant** because the requirement to vegetate replacement flood storage sites and maintain pervious surfaces would reduce the risk of erosion in the long term. Alternative 3, as with Alternative 2, would have a **negligible long-term beneficial effect** compared to the No Action Alternative by maintaining or increasing soil stability once the replacement vegetation becomes established.

4.5. Water Quality

Water resources include surface water and groundwater (wetlands are evaluated in Section 4.6). Water quality is the condition of a water body as it relates to beneficial uses such as recreation, scenic enjoyment, human health, and aquatic habitat. Water quality is regulated by both the CWA and Oregon state statutes. A detailed analysis of impacts to water quality is presented in the *Water Quality Technical Report* provided in Appendix G.

A watershed is a land area that collects water from rain, snow, and runoff and directs it to a common body of water.

Impervious surface was selected as a proxy for water quality because it is a well-established indicator of watershed health, and it is strongly correlated with pollutant loading and hydrologic disruption. Because impervious surface area is quantifiable through satellite imagery and GIS tools, it provides a consistent metric for assessing water quality impacts at a watershed scale. Increased impervious surfaces, such as roads, parking lots, and rooftops, lead to declining water quality by preventing natural water infiltration and generating higher surface runoff that carries pollutants, sediments, and contaminants directly into water bodies. This increased runoff disrupts groundwater recharge and diminishes vegetation, ultimately leading to diminished water quality. Watersheds with larger amounts of impervious surface experience more severe water quality impairment, including elevated pollutant loads, warmer stream temperatures, and altered hydrology, which collectively harm aquatic ecosystems. Studies consistently highlight a 10 percent impervious surface area threshold as a tipping point beyond which water quality declines, and a 30 percent threshold where severe impairment of water quality is observed.

Research also shows that impervious surface area has a pronounced negative impact on fish health, primarily by altering habitat and water quality. Impervious surfaces increase stormwater runoff, carrying pollutants like heavy metals and hydrocarbons into streams, leading to acute toxicity in fish during heavy rainfall events. Studies have found that watersheds with higher impervious coverage showed significant declines in fish reproductive behaviors, such as reduced spawning attempts. Research also highlights salmon vulnerability to urban runoff, with contaminated stormwater leading to high mortality rates and low spawning rates. SFHA development and stream channel modification further impair fish habitats, impacting spawning and rearing areas and reducing habitat complexity.

The CWA of 1972 (33 U.S.C. Section 1251 et seq. [1972]) establishes water quality standards for surface waters, which are used as the foundation for controlling pollution. These standards set criteria for various pollutants and specify designated uses for water bodies such as drinking water supply, recreation, and aquatic life habitat.

Section 303 of the CWA pertains to the establishment and implementation of water quality standards and water pollution control in the United States, providing a framework for regulating pollutant discharges and protecting the quality of surface waters. Section 303 requires states to develop and adopt water quality standards for their waters, including rivers, lakes, streams, and coastal areas, and requires states periodically review and revise their water quality standards to

ensure they reflect the latest scientific knowledge and address emerging water quality issues. States must submit their water quality standards to EPA for approval.

Section 401 of the CWA grants states and authorized Tribes the authority to review and certify certain federal actions that may affect water quality within their boundaries. This ensures that federal projects or permits issued by federal agencies comply with state or Tribal water quality requirements.

Section 402 of the CWA establishes the National Pollutant Discharge Elimination System (NPDES). This permit program is designed to regulate the discharge of pollutants from point sources into navigable waters to protect and restore water quality by authorizing EPA to issue permits for the discharge of pollutants. These permits establish limits on the types and amounts of pollutants that can be discharged and establish monitoring and reporting requirements to ensure compliance with water quality standards. Oregon's Department of Environmental Quality (ODEQ) manages NPDES compliance at the state level. As part of Section 402 compliance, the state issues a Construction Stormwater General Permit, and projects must request authorization to work under this permit when there would be more than 1 acre of ground disturbance. As part of this NPDES permit, a stormwater pollution prevention plan is required for construction (ODEQ 2024a).

Additionally, section 402 municipal separate storm sewer system (MS4) permits are also issued by the state and regulate conveyances, such as drainage, that discharge into waters of the state. Areas with populations greater than 100,000 need to obtain a Phase 1 MS4, while areas with populations less than 100,000, and are within urban areas, need to obtain a Phase 2 MS4 (ODEQ 2024b). Phase 1 MS4 permits apply to municipalities with populations greater than 100,000 and require comprehensive stormwater management programs, while phase 2 MS4 permits apply to smaller urban areas and have less extensive requirements. While MS4 regulations help manage water quality, they do not prevent net increases in impervious surface. MS4 permits primarily regulate pollutant discharge rather than maintaining existing conditions, which is the goal of the proposed no net loss standards. Additionally, not all projects are subject to MS4 permitting, as it only applies within designated municipal areas, whereas no net loss standards would apply more broadly within the SFHA.

Section 404 of the CWA regulates the discharge of dredged or fill material in waters of the United States (WOTUS), including wetlands, to minimize adverse impacts on water quality, aquatic ecosystems, and the environment. WOTUS include navigable waters, interstate waters, territorial seas, tributaries, adjacent wetlands, as interpreted by EPA and USACE. Section 404 requires individuals, businesses, and government agencies to obtain a permit from USACE before discharging dredged or fill material into waters of the United States, including wetlands.

State regulations administered by ODEQ build on the CWA, setting standards tailored to protect Oregon's water bodies. The State of Oregon enforces water quality standards, pollutant thresholds, and an antidegradation policy to protect high-quality waters while managing activities that might impact lower-quality streams. "Waters of the state" in Oregon include all natural and artificial waterways that are wholly or partially within the state. Waters of the State in Oregon are subject to

state-specific regulations that require permits and mitigation to prevent water quality impairment. Additionally, the Integrated Water Resources Strategy by the Oregon Water Resources Department also aims to achieve sustainable water use and quality, emphasizing drought resilience and ecosystem preservation.

The Oregon Department of State Lands (ODSL) administers the Oregon Removal-Fill Law (ORS 196.795 through 990), which requires any person who plans to "remove or fill" more than 50 cubic yards of material within "waters of the state" to obtain a permit from ODSL (ODSL 2024a). The Oregon Parks and Recreation Department issues removal-fill permits for projects occurring along the coast. The law aims to protect wetlands and waterways by managing major alterations. However, the law does not apply to all areas within the SFHA; it only applies to those areas that contain regulated waters and therefore does not apply as broadly as no net loss standards. The state law also does not apply to projects that would remove or place less than 50 cubic yards of fill.

At the local level, cities like Portland and Eugene implement stormwater management and flood hazard regulations. The cities do this by requiring developers to mitigate new impervious surfaces through stormwater retention and on-site infiltration practices. These local rules aim to protect water quality by addressing urban stormwater impacts, maintaining natural water infiltration in floodplains, and minimizing development impacts on vulnerable flood-prone areas. However, the area and type of projects that these local regulations are applied to varies as do the local goals and thresholds for compliance.

4.5.1. EXISTING CONDITIONS

Oregon's watersheds exhibit a diverse range of geographic features, from coastal regions to mountain ranges, valleys, and deserts. These watersheds are defined by Hydrologic Unit Codes, which allow for a standardized approach to managing water resources. Important watersheds in the Oregon plan area include the Willamette, John Day, Deschutes, and Lower Snake River basins. Each has unique environmental conditions that influence water quality. For instance, urbanization in the Willamette Valley contributes to increased impervious surface cover, affecting water quality through stormwater runoff and pollutant loading. Areas with more impervious surface coverage, such as Portland and Eugene, are correlated with more runoff, less groundwater recharge, and increased pollutant transport. In contrast, rural areas in eastern Oregon exhibit low impervious surface coverage due to limited development and a greater proportion of the land uses in open space and agricultural and natural resource lands. **Figure 4-5** depicts the variability of impervious surface coverage across the Oregon plan area with darker blue watersheds having higher levels of impervious surface coverage. The distribution of impervious surfaces closely mirrors patterns of urbanization and population density across the state. For example, Willamette Valley and the Portland metro area have watersheds with some of the highest levels of impervious surface, reflecting their dense development and infrastructure.

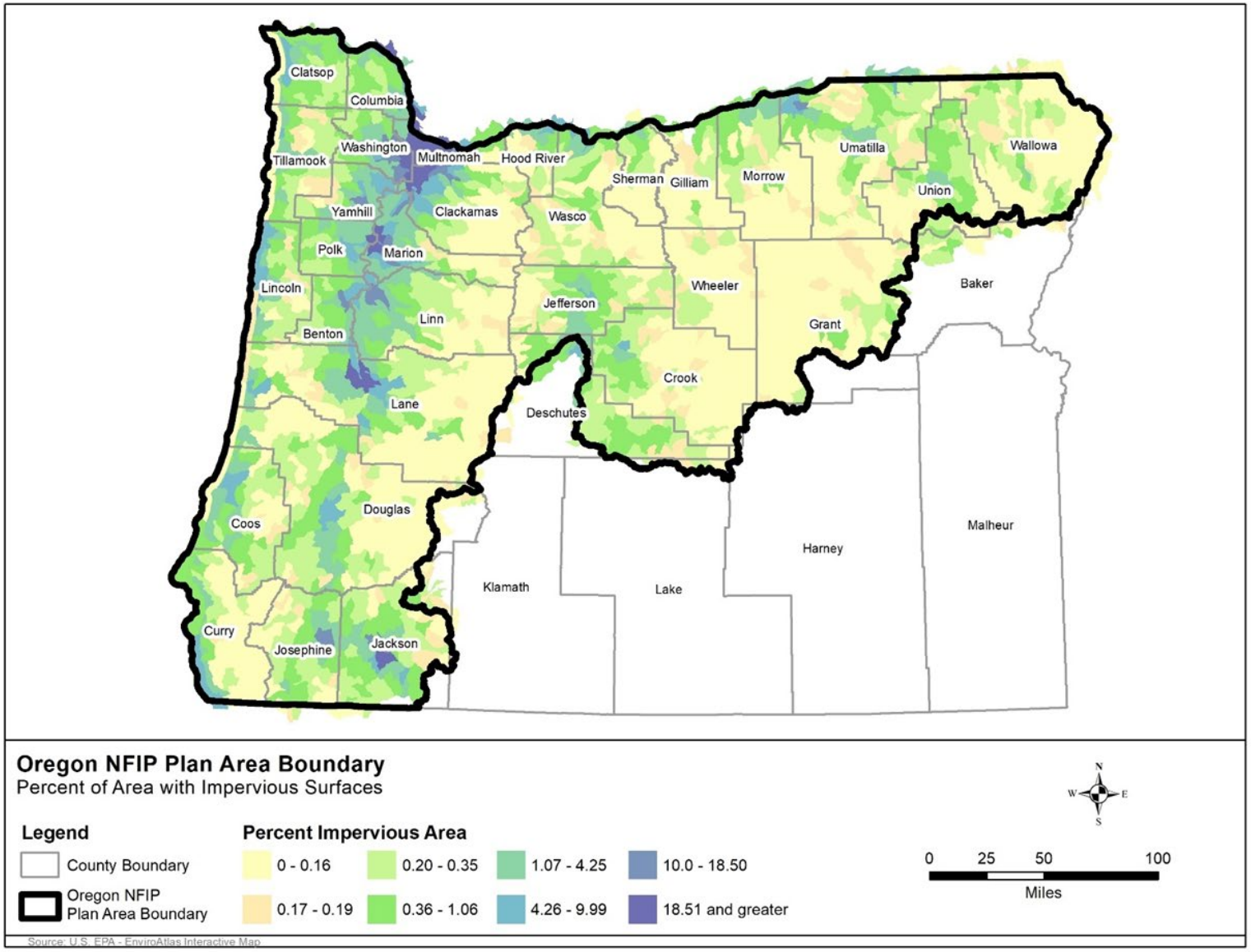

Figure 4-5. Percent Impervious Surface Area within Oregon Plan Area

Water quality data from ODEQ's Ambient Water Quality Monitoring System shows the variability of water conditions across these watersheds. Data was synthesized from 11 stations throughout the Oregon plan area. Key parameters measured include temperature, dissolved oxygen, turbidity, and chlorophyll-a, which are all indicators of the health of aquatic ecosystems.

Water quality monitoring across the Oregon plan area highlights the strong correlation between impervious surface coverage and key water quality parameters, including temperature, dissolved oxygen, turbidity, and chlorophyll-a. Increased impervious surfaces contribute to warmer water temperatures, which negatively impact fish populations, particularly salmonids. Elevated temperatures, resulting from decreased shade, reduced groundwater recharge, and thermal pollution from stormwater runoff, cause stress, increase susceptibility to disease, and elevate mortality rates in fish. At several monitoring stations, temperatures exceeded 18°C, the recommended threshold for adult salmonid migration and juvenile rearing.

As impervious surface coverage increases, dissolved oxygen levels tend to decline, further stressing fish populations. The data show dissolved oxygen levels ranging from 4.5 mg/L to 14.1 mg/L, with low values recorded in urbanized watersheds. Salmonids are highly sensitive to dissolved oxygen depletion, experiencing physiological stress below 6 mg/L and potential mortality at levels below 3 mg/L. Elevated turbidity levels are also linked to urbanization, as stormwater runoff carries sediments and pollutants into waterways. Turbidity values at monitoring stations varied widely, from 0.5 to 328 NTU, with higher levels in urbanized watersheds. Excess turbidity disrupts fish habitats by reducing foraging efficiency, impairing gill function, and decreasing spawning success.

Chlorophyll-a levels, an indicator of algal biomass, ranged from 0.2 to 17.3 µg/L. Higher concentrations of chlorophyll-a are associated with nutrient pollution from fertilizers, sewage treatment plants, and urban runoff. Excess algal growth (eutrophication) can cause physiological damage to fish, reduce juvenile survival rates, and contribute to declining dissolved oxygen levels as algal blooms decompose.

Impervious surface data indicate that most watersheds in the Oregon plan area remain below the 10 percent threshold. However, some watersheds within urbanized areas, such as Multnomah County, exceed this threshold, leading to higher temperatures, increased turbidity, and elevated nutrient levels at monitoring stations. The Willamette watershed is particularly affected, with substantial water quality impairment due to urban development. Watersheds in other communities, such as Washington County, are approaching the 10 percent threshold, making them increasingly vulnerable to stormwater impacts and pollution.

Water quality data supporting these findings are presented in Appendix G.

4.5.2. EXISTING CONDITIONS — DEVELOPMENT

Under existing conditions, which include current federal, state, and local regulations, development impacts water quality in the Oregon Plan area. Development may require directly dredging or filling water bodies. Further, development could lead to an incremental increase in impervious surfaces (as well as reductions of flood storage capacity and trees) as new residential, commercial, and industrial

areas are established. The increase in impervious surfaces is directly linked to increased stormwater runoff, which can carry pollutants into water bodies, thereby impairing water quality. The reduction of flood storage capacity can result in altered water flow patterns and increased risk of erosion and sedimentation. The reduction of trees can result in increased water temperatures from the loss of shade provided by trees.

Existing statutes, regulations, and programs addressing water quality would remain unchanged under existing conditions. These measures include, but are not limited to, CWA Section 402 National Pollutant Discharge Elimination System (NPDES) permits that regulate discharge of pollutants from point sources and stormwater runoff from construction sites; CWA Section 404 permits and Oregon Removal-Fill Laws that regulate the discharge of dredged or fill material in surface waters; TMDLs; and local regulations protecting water quality and pervious surfaces. While these measures are effective for the projects and activities to which they apply, they do not extend to all types of development. For example, measures such as the NPDES Construction General Permit and MS4 Permit only apply if construction or development is above a certain threshold. Although local floodplain management regulations apply to all development in the SFHA, they are designed to manage flood risks and do not address all emerging water quality challenges. Existing regulations and standards do not prevent cumulative increases in impervious surfaces or associated water quality impairment at a watershed scale as demonstrated by the Oregon State 303(d) list of impaired waters.

4.5.3. SIGNIFICANCE CRITERIA

The evaluation of impacts on water quality considers the extent to which the alternatives might alter floodplain functions and water quality conditions in the SFHA and surrounding watersheds. An alternative would result in significant adverse impacts on water quality if it meets one or more of the following criteria:

- Potentially exceeds regulatory limits beyond what is reasonably expected from development under existing conditions.
- Results in conditions that compromise the floodplain's capacity to filter pollutants, manage runoff, or maintain water quality beyond what is reasonably expected from development under existing conditions.

4.5.4. IMPACTS COMMON TO ALL ALTERNATIVES

None of the alternatives would alter the amount or anticipated rate of development across the state, which is driven by population change and economic growth factors (Section 4.1.1.1). Continued development in the SFHA is anticipated in NFIP-participating communities under all alternatives, as described in Section 4.2. All alternatives would be subject to existing regulations, which could help to minimize and avoid impacts on water quality. The alternatives do not involve authorizing, funding, undertaking, or encouraging development in the SFHA and there would be no physical development in the SFHA that would occur from implementation of the alternatives. Therefore, there would be no direct impacts from the alternatives.

4.5.5. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. Because implementation of the NFIP would remain unchanged, there would be no change in impacts on water quality, surface water, or groundwater compared to existing conditions (Section 4.5.2). As discussed under impacts common to all alternatives (Section 4.5.4), existing regulations could help to minimize and avoid impacts on water quality but do not prevent cumulative increases in impervious surfaces or associated water quality impairment at a watershed scale under existing conditions.

However, as discussed in Section 3.2, implementation of the NFIP in the Oregon plan area as described in Section 1.3 would not include additional steps NMFS identified in the 2016 BiOp as necessary to avoid adverse impacts on floodplain functions, which includes water quality degradation. Thus, based on NMFS' determination in the 2016 BiOp, floodplain development may be expected to result in a continued **major long-term adverse impact** on water quality. Impacts would **not be significant** because there would be no change in impacts compared to existing conditions.

4.5.6. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. Projects with ESA compliance that would not implement the no net loss standards are estimated to be approximately 16 percent of the development that would be expected to occur in the SFHA. The no net loss standards would limit increases in impervious surface and mitigate potential negative impacts on water quality, preserving or offsetting losses in pervious surface, flood storage, and vegetation.

Actions required to achieve no net loss would increase the potential short-term impacts from ground disturbance on water quality such as sedimentation. Short-term impacts under Alternative 2 include temporary increases in sediment and nutrient levels due to ground disturbance associated with implementing no net loss, such as soil disturbance to remove impervious surface and create replacement flood storage or through tree replacement planting. These activities may cause a minor decline in water quality by raising turbidity levels and introducing nutrients into water bodies. Existing regulations, such as NPDES Construction Stormwater General Permit, the CWA Section 404 permit and Oregon Removal-Fill Permit, would help to avoid and reduce impacts on water quality from construction; however, they do not apply to all developments and some impacts would occur. Therefore, Alternative 2 would result in a localized **negligible short-term adverse impact** from ground disturbance to implement the no net loss standards.

Development without project-specific ESA compliance would implement the no net loss standards, preventing further water quality impairment associated with impervious surface increases in the SFHA. This would reduce pollutant loads and stormwater runoff impacts compared to the No Action Alternative. Development with project-specific ESA compliance may be required to take mitigation actions to maintain water quality; however, these may or may not include no net loss of impervious surface. Under Alternative 2, the amount of impervious surface in the SFHA would not increase as

much as under the No Action Alternative. The cost and complexity of the no net loss standards may influence some development to occur outside of the SFHA (Section 4.2.5). Thus, there might be more impervious surface created in a watershed outside of the SFHA compared to existing conditions, and therefore, the No Action Alternative. However, the total amount of development would not change (Section 4.2) and most development in the SFHA (approximately 84 percent) would implement the no net loss standards. Therefore, it would take longer for watersheds to reach the 10 percent threshold.

The implementation of the no net loss standards would reduce the rate of increase in impervious surface coverage over time, although it would not eliminate them entirely. Alternative 2 would not eliminate watershed-scale increases in impervious surface coverage that occur from development outside of the SFHA and may influence some development to move to locations outside the SFHA to avoid the cost and complexity of implementing no net loss. In addition, this alternative would not require no net loss standards for development that undergoes project-specific ESA compliance through other means. Therefore, although no net loss would be implemented by more development in the SFHA as compared to the existing condition, impervious surface area within both the watershed and the SFHA would continue to increase over the long term. Thus, Alternative 2 would result in a **negligible to minor long-term beneficial effect** on water quality compared to the No Action Alternative because total increases in watershed-scale impervious surface coverage would be reduced, but not eliminated, and the floodplain water quality functions of flood storage and trees would be maintained with the exception of development with project-specific ESA compliance. While incremental impairment of water quality would still occur, the impacts would **not be significant** because the scale of impairment over time would be less than expected for development under the existing conditions and the No Action Alternative.

4.5.7. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. As with Alternative 2, Alternative 3 would result in a short-term adverse impact on water quality due to the ground disturbance associated with implementing the no net loss standards. The impact would be slightly greater under Alternative 3, as it would apply to approximately 16 percent more developments in the SFHA than under Alternative 2.

Alternative 3 may be more likely to influence development to occur outside of the SFHA than Alternative 2 based on the broader application of the no net loss standards. As with Alternative 2, watershed-level impervious surface expansion is expected to continue. Watersheds in urban areas that have not already reached the 10 percent threshold may eventually meet or exceed it. The comprehensive application of no net loss standards may influence development to occur outside the SFHA to avoid increased costs associated with mitigation. However, development would mostly occur within established UGBs, where zoning and land sure regulations would continue to apply. This change in development patterns may influence regional water quality, as it can lead to new impervious surfaces outside the SFHA, where water quality impacts may not be mitigated as rigorously. Consequently, while water quality improvements are anticipated within the SFHA, there

may be indirect impacts on water quality outside these areas. However, as with Alternative 2, the rate of development would not change. In addition, more development would implement the no net loss standards than under Alternative 2. Thus, the negative impacts on water quality typically associated with impervious surface expansion would be delayed over the long term as compared to the No Action Alternative and Alternative 2. Maintaining flood storage capacity and trees in the SFHA would reduce the risk of erosion, associated sedimentation, and the increases in water temperature associated with a loss of shade to a greater degree under Alternative 3 than under the other alternatives.

In summary, Alternative 3 would result in a localized **minor short-term adverse impact** on water quality from additional ground disturbance to implement no net loss standards. Alternative 3 would result in a **minor long-term beneficial effect** on water quality as compared to the No Action Alternative because total increases in watershed-scale impervious surface coverage would be reduced. This beneficial effect would be slightly greater than under Alternative 2 because projects with a federal nexus and project-specific ESA compliance and would also implement the no net loss standards under Alternative 3 (estimated to be 16 percent of the projects in the SFHA). Even if some of those projects decide to move to locations outside of the SFHA due to the cost and complexity of implementing both no net loss standards and project-specific ESA compliance measures, the increase in impervious surface on a watershed scale would still be less than reasonably expected under existing conditions. Impacts would **not be significant** because although incremental impairment of water quality would still occur, the scale of impairment over time would be less than reasonably expected under existing conditions and the No Action Alternative.

4.6. Wetlands

Wetlands are sensitive ecosystems that provide environmental services such as water filtration and storage, wildlife habitat, and coastal buffering. Wetlands are vulnerable to disturbance from development, particularly the effects of soil compaction, sedimentation, pollution, and vegetation removal. These disturbances can result in changes to water flow and absorption, reducing the vitality and effectiveness of wetlands. Impacts on wetlands are regulated at the federal, state, and local levels.

The CWA of 1972 (33 U.S.C. Section 1251 et seq. [1972]), as discussed in Section 4.6, is also relevant to wetlands. Section 404 of the CWA regulates the discharge of dredged or fill material in waters of the United States, including wetlands, to minimize adverse impacts on water quality, aquatic ecosystems, and the environment. Section 404 requires individuals, businesses, and government agencies to obtain a permit from USACE before discharging dredged or fill material into waters of the United States including wetlands. However, not all wetlands fall under the jurisdiction of Section 404.

FEMA regulations in 44 CFR Part 9, *Floodplain Management and Protection of Wetlands*, set forth the policy, procedures, and responsibilities to implement the required 8-step process for evaluating proposed actions that are in or may affect wetlands, including the assessment of practicable alternatives. These regulations are described further in Section 4.7, Floodplains.

The Oregon Removal-Fill Law (ORS 196.795 through 990), as discussed in Section 4.6, aims to protect wetlands and waterways by managing major alterations. It requires any person who plans to "remove or fill" more than 50 cubic yards of material within "waters of the state", which includes wetlands, to obtain a permit (ODSL 2024a). Wetlands that meet the definition of "waters of the state" may include wetlands that are not also regulated under the CWA. However, the law does not apply to all areas within the SFHA unless those areas contain regulated waters, nor does it apply to all projects within regulated waters.

Local wetland protection ordinances can also prioritize the preservation and restoration of wetlands to safeguard their ecological, hydrological, and conservation functions. For example, Scappoose enacted regulations that establish buffer zones and prohibit development, vegetation removal, and other disturbance near locally inventoried wetlands (Ordinance Number 736, Chapter 17.85). Other jurisdictions in the plan area such as Corvallis and Eugene have enacted similar regulations.

4.6.1. EXISTING CONDITIONS

Existing wetland acreage and distribution were analyzed using the NLCD (MRLC 2021). For consistency with other sections in this document, wetland classification according to the NLCD is used in this section, which does not equate to regulated wetlands.

The NLCD was used to evaluate the existing land cover types within the Oregon plan area, as discussed further in Section 4.2. To evaluate existing land-use conditions within the four sub-study areas in the Oregon plan area, the most recent data set (2021) was used. The NLCD includes two wetland categories, emergent herbaceous wetlands and woody wetlands (MRLC 2024). Emergent herbaceous wetland areas are those areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water. Woody wetlands are areas where forest or shrubland vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water. These two types are combined in the analysis.

As shown in Table 4.15, approximately 22.3 percent of the land within the SFHA is covered by wetlands. Within all UGBs in the Oregon plan area, 4.0 percent of the land is covered by wetlands, whereas 19.9 percent of land within a UGB that is also within the SFHA is within wetlands. The lowest percentage of wetlands is within the UGB but outside of the SFHA (1.9 percent). Therefore, the SFHA has a much higher occurrence of wetlands compared to non-SFHA areas. A detailed breakdown of land cover data is described in the *Biological Technical Report* (Appendix H).

Table 4.15. Wetlands within the Oregon Plan Area

Sub-Study Area[2]	Total Acres in Sub-Study Area[2]	Wetland[1] Acres in Sub-Study Area[2]	Percentage of Wetlands[1] in Sub Study Area[2]
SFHA	1,191,622.6	265,273.2	22.3
Fringe SFHA	3,051,818.6	99,450.4	3.3
Total UGB	763,227.9	30,760.9	4.0

Sub-Study Area[2]	Total Acres in Sub-Study Area[2]	Wetland[1] Acres in Sub-Study Area[2]	Percentage of Wetlands[1] in Sub Study Area[2]
Fringe UGBs	348,020.6	23,310.2	6.7
SFHA Within a UGB	90,795.9	18,091.8	19.9
Fringe SFHA in a UGB	280,445.6	8,757.1	3.1
UBG not including SFHA	672,432.0	12,669.1	1.9

Source: USGS and MRLC 2021, FEMA 2024a

Notes:

1 "Wetlands" includes two NLCD categories: "woody wetlands" and "emergent herbaceous wetlands." NLCD land cover categories do not necessarily equate to regulated (protected) wetlands.

2. Data does not include wetlands that may be within areas that are non-UGB, non-SFHA, and outside of both the Fringe UGB and Fringe SFHA (0.25-mile buffer). Wetlands not included in the data may still be impacted by the alternatives if some development is influenced to move to areas outside of these areas (Appendix H).

Table 4.16 shows the change in wetlands in the Oregon plan area from 2011 to 2021. Since 1850, wetlands in Oregon have decreased by 38 percent (NRCS 2023). Although NLCD data indicates increases in wetlands in the geographies analyzed, the increase is commensurately small considering historic losses and continued losses may still being occurring in some areas, despite increases in others. Oregon has indicated it is not yet meeting the statewide goal of no net loss of wetlands (ODSL 2024b). Although wetland regulations require avoidance of wetland impacts and compensatory mitigation when avoidance is not possible, the regulations do not apply to all wetlands or to all projects that may impact wetlands.

Table 4.16. Change in NLCD Wetlands between 2011 and 2021

Sub-Study Area[2]	Wetlands[1] Acres 2011	Wetland[1] Acres 2021	Percentage Change
SFHA	255,347.3	265,273.2	3.7
Fringe SFHA	98,048.8	99,450.4	1.4
UGBs	29,181.2	30,760.9	5.1
Fringe UGBs	22,616.7	23,310.2	3.0
SFHA Within a UGB	16,612.4	18,091.8	8.2
Fringe SFHA in a UGB	8,712.3	8,757.1	0.0

Source: USGS and MRLC 2011 and 2021, FEMA 2024a

Notes:

1. "Wetlands" includes two NLCD categories: "woody wetlands" and "emergent herbaceous wetlands." NLCD land cover categories do not necessarily equate to regulated (protected) wetlands.

2. Does not include wetlands that may be within non-UGB and non-SFHA outside of the Fringe UGB (0.25-mile buffer) that would not be impacted by the alternatives (Appendix H)

4.6.2. EXISTING CONDITIONS — DEVELOPMENT

Currently ongoing and continuing development under existing conditions could result in temporary or permanent impacts on wetlands from dredging or filling, ground disturbance, vegetation removal, or the accidental release of contaminants of pollutants by equipment. Federal and state regulations

apply to projects that have the potential to impact regulated wetlands, and may require restoration, enhancement, or creation of wetlands to offset losses. Although existing regulations would continue to protect some wetlands from development, they may not apply to all wetlands or to all development projects in the SFHA.

4.6.3. SIGNIFICANCE CRITERIA

An alternative would result in significant adverse impacts on wetlands if it meets one or more of the following criteria:

- Results in conditions that compromise wetland environmental services (e.g., water filtration and storage, wildlife habitat, and coastal buffering) beyond what is reasonably expected for development under existing conditions.
- Conflicts with existing federal, state, or local wetland protection laws or regulations.

4.6.4. IMPACTS COMMON TO ALL ALTERNATIVES

None of the alternatives would alter the amount or anticipated rate of development in the plan area, which is driven by population change and economic growth (Section 4.1.1.1). Continued development in the SFHA is anticipated in NFIP-participating communities under all alternatives, as described in Section 4.2. All alternatives would be subject to existing regulations, which could help to minimize and avoid impacts on wetlands.

4.6.5. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. Because implementation of the NFIP would remain unchanged, there would be no change in impacts on wetlands compared to existing conditions (Section 4.6.2). Because the No Action Alternative would not change impacts on wetlands compared to existing conditions, the NEPA finding is **no impact** compared to existing conditions.

4.6.6. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. Projects with ESA compliance that would not implement the no net loss standards are estimated to be approximately 16 percent of the development that would be expected to occur in the SFHA.

Replacement flood storage may result in unintended changes to floodplain dynamics, which could result in changes to nearby wetland hydrology in the SFHA by altering how surface runoff flows across the landscape. Replacement flood storage sites may capture floodwaters that would have otherwise flowed into a nearby wetland. Changes to water flow and absorption associated with replacement flood storage could reduce the vitality and effectiveness of wetlands. Some wetlands may adjust to changing floodplain dynamics over time, but temporary losses of wetland services could occur. Ground disturbance associated with the no net loss standards that occurs near wetlands could have

additional adverse impacts. In the creation of replacement flood storage areas, the removal of productive topsoil as discussed in Section 4.4.6 would likely make revegetation challenging, potentially leading to water quality impacts and increase the potential for invasive species coverage. The longer soils are exposed, the more likely it is that erosion may occur, which could impair nearby wetlands. Replacement flood storage sites would be revegetated over time, which would reduce the risk of erosion. Increased areas of invasive plant species established in disturbed ground associated with newly created flood storage areas could spread to wetlands. These effects could reduce wetlands' ability to provide ecosystem services.

The no net loss mitigation for pervious surfaces would help maintain water quality and subsurface flows critical for wetland ecosystems in the SFHA. Additionally, mitigation requirements regarding tree replacement, replacement flood storage revegetation, and beneficial gain plantings may maintain wetland health in the SFHA by supporting continued filtering of pollutants and reducing the risk of erosion and sediments entering wetlands. As discussed in Section 4.4.6, it is possible that the number of trees, and associated benefits such as erosion reduction and temperature moderation could improve in the long term, as trees mature. This could support wetlands if replacement trees were replanted nearby.

While wetlands associated with waters of the U.S. and state are regulated, not all wetlands are covered, and impacts could still occur from development. As discussed in Section 4.2.5, over the long term, some development may be influenced to move outside the SFHA to avoid the cost and complexity of implementing the no net loss standards. Should some development shift outside of the SFHA, this could reduce development pressure on wetlands in the SFHA.

Therefore, Alternative 2 would have a **localized minor short-term adverse impact** on wetlands in the SFHA from additional ground disturbance which could result in erosion, sedimentation, and increase the potential for invasive species coverage. Alternative 2 would have a **minor localized long-term adverse impact** on wetlands in the SFHA from potential altered floodplain dynamics associated with implementation of flood storage mitigation. Impacts **would be significant** as they could compromise wetlands services (e.g., water storage and filtration) beyond what is reasonably expected from development under existing conditions and the No Action Alternative. However, Alternative 2 would also have a **regional negligible long-term beneficial effect** on wetlands in the SFHA compared to the No Action Alternative because pervious surface and vegetation would be maintained to filter pollutants and support wetland health.

4.6.7. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means.

To a slightly higher degree under Alternative 3 than Alternative 2, the no net loss standards have the potential to disturb wetlands because they would be applied to approximately 16 percent more development than under Alternative 2. Unintended changes to floodplain dynamics could alter wetland hydrology. Other adverse impacts from the creation of flood storage on nearby wetlands would be similar to those described for Alternative 2 such as an increased potential for invasive

species coverage. The no net loss standards for pervious surface and vegetation would better maintain soil stability and water infiltration under Alternative 3 than under Alternative 2 because the no net loss standards would apply to all projects in the SFHA.

Under Alternative 3, the implementation of the no net loss standards for all projects within the SFHA could influence more projects to shift outside the SFHA for reasons discussed in Section 4.2.6. However, because many of the projects with a federal nexus are anticipated to be functionally dependent on a location in the SFHA, the proportion of those able to move to non-SFHA locations would not be large. As with Alternative 2, should some development move to areas outside of the SFHA, this could reduce development pressure on wetlands in the SFHA over the long term.

Therefore, Alternative 3 would have a **localized minor to moderate short-term adverse impact** on wetlands in the SFHA from additional ground disturbance. Alternative 3 would have a **localized minor to moderate long-term adverse impact** on wetlands in the SFHA from potential altered floodplain dynamics associated with implementation of flood storage mitigation. Impacts **would be significant** as they could compromise wetlands services (e.g., water storage and filtration) beyond what is reasonably expected from development under existing conditions and the No Action Alternative. However, Alternative 3 would have a **negligible regional long-term beneficial effect** on wetlands compared to the No Action Alternative because pervious surface and vegetation would be maintained to filter pollutants and support wetland health.

4.7. Floodplains

This section represents a summary of the impacts on floodplains. For more information, please see the *Floodplain Technical Report* in Appendix I.

As defined in 44 CFR 59.1, a floodplain is any area that is susceptible to being inundated by water from any source. The SFHA is the area in the floodplain within a community subject to a 1 percent or greater chance of flooding in any given year.

Natural floodplains can provide ecosystem services such as supporting plant life and wildlife, enhancing biodiversity, provide critical habitat for wildlife, and support ESA-listed species (Association of State Floodplain Managers 2017). Vegetated floodplains can filter pollutants from water, help recharge groundwater, and reduce the risk of erosion (FEMA 2024c). Development activities can alter floodplain functions and impair the ecosystem services they provide (Konrad 2003).

As defined in Chapter 1 of this Draft EIS, the NFIA established the NFIP to "provid[e] appropriate protection against the perils of flood losses" and "minimiz[e] exposure of property to flood losses" (42 USC 4001). The primary purpose and objective of the NFIP is to provide access to federally underwritten flood insurance. The NFIA was amended in 1973 to require the purchase of flood insurance as a condition of receiving federally underwritten loans and federal assistance in the SFHA.

FEMA regulations in 44 CFR Part 9, *Floodplain Management and Protection of Wetlands*, set forth the policy, procedures, and responsibilities to implement the required 8-step process for evaluating

proposed actions that are in or may affect floodplains, including the assessment of practicable alternatives, and prohibit FEMA from funding improvements in the SFHA unless no practicable alternative is available. The 8-step for the proposed action described in this Draft EIS is available in Appendix J.

Oregon has delegated land-use authority to local governments, which adopt floodplain management regulations designed to promote the public health, safety, and general welfare of its citizenry (ORS 197.175). DLCD works actively with local governments to help them manage development in floodplains, in alignment with the NFIP minimum floodplain management standards. The Oregon Model Flood Hazard Management Ordinance[50] includes standards and provisions that encourage sound floodplain management. The language is based on the minimum requirements of the NFIP found in the CFR and supports Oregon's statewide land-use planning Goal 7, Areas Subject to Natural Hazards. Cities and counties in Oregon implement the requirements of Goal 7 through local comprehensive plans, development regulations, and zoning.

As discussed in Chapter 1 of this draft EIS, many Oregon communities have standards for floodplain management, including but not limited to adopting and enforcing the minimum NFIP floodplain management standards. Participating communities ensure compliance with floodplain management through their floodplain permit processes. For example, Scappoose City Code Chapter 17.84.170 prohibits the use of fill in the SFHA unless the net effect of excavation and fill constitutes no increase in fill volume.[51] Similarly, the Lane County Code Chapter 16.244.5.bb(D) requires feasibility studies ensuring that habitat is enhanced or restored for projects in the regulatory floodway.

4.7.1. EXISTING CONDITIONS

The Oregon plan area is approximately 36.6 million acres, which covers approximately 58 percent of the state. Approximately 3.3 percent of the Oregon plan area is in the SFHA (**Figure 4-6**). There are seven different types of flood zones mapped in the SFHA of the Oregon plan area: Zones A, AE, AE (floodway), AH, AO, V, and VE (coastal zones subject to wave action). These zones define areas with a 1-percent annual chance of flooding and are often referred to as the "100-year floodplain." Flood insurance is mandatory for properties with federally underwritten loans in the SFHA.

Floodplains within the Oregon plan area vary in topography, vegetative characteristics, and land uses. The Oregon plan area floodplains include low-lying areas, wetlands, river valleys, as well as both densely and sparsely developed areas. These characteristics influence the flood storage capacity of the floodplain and the natural functions that an area can provide.

[50] https://www.oregon.gov/lcd/nh/pages/nfip.aspx

[51] Scappoose City Code Chapter 17.84.170 specifies no net increase in fill in the floodway fringe. Floodway fringe is defined in the code as those areas outside the floodway but within the 100-year floodplain.

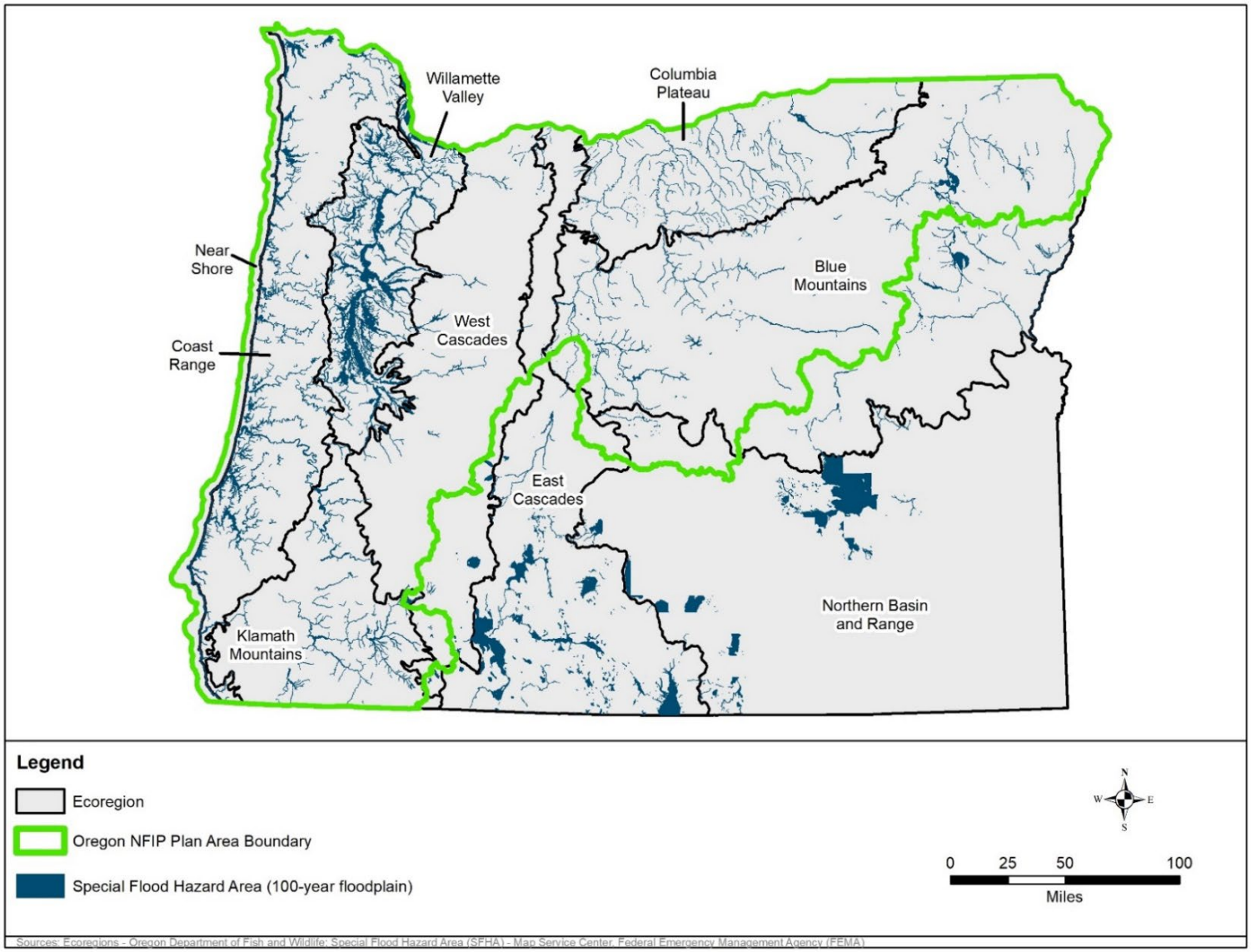

Figure 4-6. FEMA Floodplains in the Oregon Plan Area

Floodplains are constantly changing environments that play a key role in managing water flow, supporting biodiversity, and enhancing ecosystem functions. However, various impediments can disrupt these natural processes. Human interventions, such as the construction of dams, levees, and development, can alter natural water flows, reduce the natural storage capacity of floodplains, and can create barriers for wildlife. These modifications could lead to altered flood risk, loss of habitat connectivity, and diminished water quality.

The link between natural floodplain functions and human infrastructure and development can create challenges in balancing flood risk reduction while keeping ecological diversity intact. Recognizing the extent and impact of these impediments leads to a better understanding of the issues surrounding floodplain management and effects on both public safety and environmental health.

As discussed in Section 4.2, the SFHA within the plan area has experienced varying levels of development over time. Urbanization and agricultural activities have altered some floodplain characteristics, potentially affecting the floodplain functions. Areas with any level of development may have reduced natural storage capacity due to the placement of fill, structures, impervious surfaces, or other modifications. In Oregon, areas with higher levels of development are found in the UGB. The area of developed land in the SFHA in the Oregon plan area increased by approximately 0.1 percent between 2011 to 2021. This percentage rises to 0.5 percent for land in the SFHA specifically in the UGB. However, these numbers are both lower than the 1.7 percent increase in developed land in the UGB as a whole (including the SFHA in the UGB).

4.7.2. EXISTING CONDITIONS — DEVELOPMENT

Current and ongoing development occurring in the SFHA under existing conditions generally:

- Involves ground disturbance, which can result in erosion or sedimentation
- Involves the use of equipment, which could result in the release of pollutants or contaminants (e.g., oil and gas leaks)
- Involves occupancy of the floodplain by placing fill or structures
- Replaces pervious surfaces with impervious materials
- Removes vegetation (including trees)

The potential for erosion and the release of pollutants or contaminants is minimized through best management practices (BMP) such as silt fences and using equipment in good condition and compliance with local, state, and federal regulations. Some revegetation or landscaping may occur at the discretion of the developer or based on local regulations as discussed further in Section 4.8. Some development in the SFHA would have a federal nexus. The federal agency providing funding or assistance would be required to comply with federal laws.

Floodplain functions under existing conditions would be adversely impacted gradually because of continued development. Reducing flood storage capacity and pervious surface could diminish habitat diversity and health for species like salmonids during high-flow conditions (Konrad 2003).

Water quality could be compromised because of reduced pervious surfaces, which is a known key driver of water quality (see Section 4.5). Removal of trees with no tree replacement requirement could negatively affect habitat, water quality, and overall ecosystem resilience. Collectively, reductions of flood storage, pervious surface, and trees limit where water can flow during a flood and its ability to infiltrate into the ground (Konrad 2003).

The full extent of impacts of a particular development project might be impossible to determine without a hydraulic and hydrologic (H&H) analysis, which are not required for all projects. Currently, under the NFIP and local floodplain management regulations, an H&H study would only be completed to demonstrate that a proposed development would not (a) increase flood depths in the delineated floodway or (b) result in an increase of more than 1-foot when the proposed development would affect 5 acres or subdivide into 50 lots or more in an approximate AE Zone. Although reductions in flood storage may not be measurable at the scale of an individual development, these impacts could compound across multiple developments that occur over time.

Some development in the SFHA may be associated with restoration activities (typically wetland restoration) implemented by communities, organizations, or other agencies. Development with the sole purpose of restoration could result in ground disturbance, require the use of equipment, and may involve occupancy of the floodplain (e.g., placement of woody material); however, restoration activities result in long-term benefits on habitat and floodplain ecosystems.

Some development would be required to perform habitat restoration as a condition of a federal nexus (e.g., CWA permit or federal funding), or state permitting (e.g., Oregon Fill-Removal Law). Such restoration is typically associated with wetlands. As discussed in Section 4.7, approximately 22 percent of the land within the SFHA is covered by wetlands.

4.7.3. SIGNIFICANCE CRITERIA

The evaluation of the significance of impacts on floodplains considers the extent to which the alternatives might impact conditions based on the following criteria:

- Flood risk management factors including the ability to access federally underwritten flood insurance, federal financial assistance for flood-related hazards, and technical assistance for flood hazard reduction, are reduced compared to existing conditions.
- Ecosystem services provided by the floodplain would be negatively affected to such a degree that there would be an adverse effect on ESA-listed species, or the natural function and services of the floodplain are diminished beyond what would be expected from projected development under the existing condition.
- The three floodplain functions of flood storage, water quality, or vegetation would be impaired beyond what is reasonably expected under existing conditions.

4.7.4. IMPACTS COMMON TO ALL ALTERNATIVES

Under all alternatives, FEMA assumes development would continue to occur both within and outside of the SFHA as it does currently. Furthermore, the total amount of future development in the Oregon plan area is assumed to be the same as currently projected.

Additionally, under all alternatives, the NFIP would continue to be implemented in the Oregon plan area, thereby maintaining federal minimum standards and the availability of certain federal financial assistance for projects in the SFHA. The continued availability of flood insurance, implementation of the minimum floodplain management standards, and the availability of certain financial assistance would provide benefits to people, communities, and floodplain functions in the Oregon plan area.

Development with the sole purpose of restoration would be an activity exempt from no net loss under Alternative 2 and Alternative 3, as it would result in long-term benefits on habitat and floodplain ecosystems (Section 4.8.2). As such, the short-term impacts and long-term benefits of restoration activities are assumed to remain the same under all alternatives.

4.7.5. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. Implementation of the NFIP would remain unchanged and would not include additional steps NMFS identified in the 2016 BiOp as necessary to avoid adverse impacts on floodplain functions. There would be no change in impacts on (e.g., occupancy of the floodplain by placing fill or structures) or benefits to (e.g., wetland restoration activities in the SFHA) floodplains as compared to existing conditions (Section 4.7.2). Thus, based on NMFS' determination in the 2016 BiOp, floodplain development may be expected to result in a continued **major long-term adverse impact** on floodplains. Impacts would **not be significant** because there would be no change in impacts compared to existing conditions.

4.7.6. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. Alternative 2 may lead to varying impacts on floodplains, depending on whether a project qualifies for exceptions based on project-specific ESA compliance. Development that implements the no net loss standards would maintain the floodplain functions of flood storage, water quality, and vegetation.

Implementing no net loss of flood storage would involve removing material (e.g., soil) through methods such as excavation or grading to replace lost flood storage capacity caused by development. Development implementing no net loss would be subject to mitigation ratios up to 4:1 for flood storage. For example, under Model Project A - Residential New Build (see Appendix E of this Draft EIS), the development of a new residence would include placing a new structure within the SFHA, requiring replacement flood storage. Because the new structure is within the RBZ, twice as much flood storage capacity must be created as was eliminated. Model Project A – Residential New Build would require 6,800 cubic feet of soil (252 cubic yards) to be removed from the SFHA for

replacement flood storage. Replacement flood storage sites would be vegetated with non-invasive species; however, the duration and magnitude of grading and excavation impacts would increase compared to existing conditions, and therefore the No Action Alternative. Grading and excavation, particularly when vegetation is removed, alter the way floodwater flows across the landscape. In addition, the removal of the topsoil to create the storage area would adversely affect soil productivity and its ability to support plant species. Replanted vegetation would also require time to mature before it could provide ecosystem benefits (Wohl 2021). There is the potential for replacement flood storage sites to be overwhelmed by non-native and invasive plant species before the initial native plantings could become established. However, once established, replacement flood storage vegetation may maintain, or even improve, ecosystems services in the long term.

Implementation no net loss of pervious surfaces under Alternative 2 aims to maintain current pervious surface conditions in the floodplain. No net loss of pervious surfaces would address water quality conditions related to runoff from impervious surfaces that are created by development in the SFHA (discussed under water quality in Section 4.5). Construction activities to implement the no net loss standards, such as excavation to create pervious surfaces, could result in short-term impacts on water quality (EPA 2024b). BMPs, such as erosion and sediment controls implemented during construction would be reasonably expected to minimize these short-term impacts; although they may not be applicable to all project types and some short-term adverse construction impacts on water quality would be expected to occur (Houser and Pruess 2009).

To meet the no net loss standard for vegetation, developers would need to replace any trees 6-inches dbh or larger that are removed because of development activities. The mitigation ratios for vegetation require that more trees be planted than are removed to account for uncertainties in the effectiveness of implementation. Such uncertainties include the quality, species, and location of the restored vegetation within the SFHA as well as the time required for new plantings to mature and provide equivalent ecological benefits. Achieving the full suite of benefits provided by mature trees may be challenging, especially when new plantings can take years to reach a functional equivalency to the pre-development conditions or may fail to establish.

In addition, replacement flood storage sites would be vegetated and to the extent that a mitigation site was not vegetated prior to construction, there could be a resulting increase in vegetation in the SFHA. Development that occurs in the RBZ and is not functionally dependent on being near waterways would also have to implement the beneficial gain standard. The beneficial gain standard would require planting native riparian herbaceous, shrub, and tree vegetation. The beneficial gain vegetation would further maintain ecological services described above in areas of higher habitat value (i.e., in the RBZ).

At the Oregon plan area scale, Alternative 2 would result in a **negligible short-term adverse impact** on floodplains due to temporary disruption of floodplain functions during construction activities to implement no net loss standards, such as removing soil, which would increase compared to existing conditions and the No Action Alternative. Alternative 2 would have a **negligible long-term beneficial effect** compared to the No Action Alternative because vegetation and pervious areas, as well as certain ecosystem services they provide (e.g., shade, woody material, filtering pollutants, erosion risk

reduction) would be maintained. Adverse impacts would **not be significan**t because certain ecosystem services would be maintained in the long term.

4.7.7. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. As such, more developments would implement no net loss of flood storage, pervious surface, and trees in the SFHA than under Alternative 2.

For example, under Alternative 3, Model Project B - Port Improvements would need to implement the no net loss standards in addition to implementing any measures identified in project-specific ESA compliance documentation. Model Project B - Port Improvements would require approximately 612,523 cubic feet (22,686 cubic yards) of soil to be removed from the SFHA to achieve no net loss of flood storage. As with Alternative 2, there is the potential for replacement flood storage sites to be overwhelmed by non-native and invasive plant species before the initial native plantings could become established.

As with Alternative 2, Alternative 3 would maintain pervious surfaces and require the replanting of trees, revegetation of replacement flood storage sites, and beneficial gain plantings, as applicable. The effects of implementing no net loss mitigation ratios for water quality, vegetation, and beneficial gain under Alternative 3 would be similar to those described under Alternative 2, except that Alternative 3 would apply no net loss standards to an additional approximately 16 percent of the developments in the SFHA. In addition, the no net loss standards would be implemented in addition to any project-specific ESA compliance measures identified, which may include habitat restoration and restoring vegetative cover. Thus, the condition of vegetation in the SFHA would be improved compared to Alternative 2.

At the Oregon plan area scale, Alternative 3 would result in a **negligible short-term adverse impact** on floodplains due to temporary disruption of floodplain functions during construction, which would increase compared to existing conditions (and therefore, the No Action Alternative) to implement the no net loss standards. Alternative 3 would have a **negligible long-term beneficial effect** compared to the No Action Alternative because vegetation and pervious areas, as well as certain ecosystem services they provide (e.g., shade, woody material, filtering pollutants, erosion risk reduction) would be maintained. Thus, impacts would **not be significant** because certain ecosystem services would be maintained in the long term.

4.8. Vegetation

Vegetation includes all plant life within an ecosystem and plays an essential role in nutrient cycling, soil stabilization, water filtration, and providing habitat for wildlife. Vegetation is a key indicator of ecosystem health and resilience. Changes to vegetation from human activities, such as construction or resource extraction, can have cascading impacts on soil integrity, water quality, and local biodiversity. Vegetation also supports floodplain functions, buffers against erosion, and contributes

to air quality. Impacts on vegetation are regulated at the federal and state levels. Additional details on vegetation, including regulatory context, existing conditions, analysis methodology, and impacts are available in the *Biological Resources Technical Report* (Appendix H).

The Federal Noxious Weed Act (7 USC 2801 et seq.) gives the U.S. Secretary of Agriculture the authority to designate and control noxious weeds. A noxious weed is a plant that a federal, state, or local government has designated as harmful to public health, agriculture, recreation, wildlife, or property. Although the Act's main emphasis is on interstate activities, it supports actions within state boundaries through cooperative efforts and agreements between federal, state, and local agencies, as well as private individuals, to control, eradicate, or prevent the spread of noxious weeds.

The Oregon Forest Practices Act (FPA) establishes regulations for commercial activities related to tree planting, management, and harvesting on non-federal forestlands of any size in Oregon. The Board of Forestry has the primary role of interpreting the FPA and creating forest practice rules. The Oregon Department of Forestry is tasked with implementing and enforcing these rules, working collaboratively with landowners and operators to ensure compliance with the FPA standards.

The Oregon Noxious Weed Control Law (ORS 561) is designed to protect the state's agriculture, ecosystems, and economy from the detrimental impacts of invasive noxious weeds. Under this law, the Oregon Department of Agriculture (ODA) is responsible for managing noxious weed control, which includes identifying, classifying, and regulating these harmful plant species. The law mandates cooperation among landowners, public agencies, and other stakeholders to prevent the introduction and spread of noxious weeds. It also outlines requirements for weed management plans and grants ODA the authority to enforce control measures to mitigate the negative effects on natural resources and agricultural productivity. Compliance is required for all actions in Oregon regardless of project scale or property size.

Several counties and municipalities in Oregon have enacted their own invasive species laws, providing additional protections for native species through local government. Local tree and vegetation ordinances are also commonplace in Oregon. Many jurisdictions require tree replacement when trees are removed and mandate specific vegetative landscaping as part of site development. For example, the City of Portland requires permitting for removing, pruning, or planting trees in most circumstances, which builds on Multnomah County's forest land zoning policy that conserves woodlands in certain areas (City of Portland 2024, Multnomah County 2016).

ESA-listed plant species that may occur in the vicinity of the Oregon plan area are discussed in Section 4.12.

4.8.1. EXISTING CONDITIONS

Oregon is a geomorphologically and ecologically diverse state; the Coast Range and Cascade Range run from north to south across the entire length of the state, forming the Willamette Valley between them. The western part of the state, which is entirely encompassed by the Oregon plan area, features a marine-influenced weather with moderate to high levels of precipitation throughout fall,

winter, and spring. The eastern part of the state is much drier. These climatic differences support distinct ecoregions, each hosting unique vegetation communities with diverse arrays of plant species adapted to local conditions (Thorson et al. 2003).

Plant species with the potential to occur in the Oregon plan area are categorized into one of three broad categories describing their use of floodplain habitats. These floodplain categories are used to discuss the potential effects of the proposed action on vegetation in the Oregon plan area. The categories are defined as follows:

- **Floodplain Obligate:** This category includes species that rely entirely on streams and the adjacent floodplain habitat areas. Species in this category include aquatic and semiaquatic species that rely on both the underwater portions of streams and the adjacent riparian areas in the floodplain. Species include sandbar willow (*Salix exigua*), broad-leaf cattail (*Typha latifolia*), and leafy pondweed (*Potamogeton foliosus*).
- **Floodplain Transitional:** This category includes species that are sometimes found in floodplains and sometimes found in non-floodplain areas. Species in this category have habitat requirements that are not dependent on floodplain areas. This includes species that 1) may use the floodplain only in particular life stages, or 2) primarily rely on habitat characteristics that do not depend on floodplain functions or features (such as vegetation types that may occur within or outside of floodplains, or species that inhabit vernal pools that may form within or outside of floodplains). Species include western redcedar (*Thuja plicata*), salmonberry (*Rubus spectabilis*), and wood sorrel (*Oxalis trilliifolia*).
- **Non-Floodplain:** This category includes wildlife species that require drier, upland habitats, and that are not expected to occur within floodplain areas. Species include big sagebrush (*Artemisia tridentata*), Oregon grape (*Mahonia aquifolium*), and ocean spray (*Holodiscus discolor*).

Although the varied topography and weather in Oregon support a great diversity of vegetation within the Oregon plan area, plant species are generally categorized by floodplain use for the purpose of this analysis. Every species is unique, and even within the same species, individual plants may respond differently to environmental pressures depending on their specific geographic and climatic conditions. Differences in plant communities by ecoregion are discussed in the *Biological Resources Technical Report* (Appendix H).

In addition to native vegetation, the success and proliferation of invasive plant species is considered in this section as well. Invasive plant species are those that are not native to Oregon and which threaten native plant species by competing for habitat space and other resources. There are 12 invasive plant species of particular concern that are known to occur within the Oregon plan area, as further detailed in the *Biological Resources Technical Report* (Appendix H). These comprise terrestrial plants including the common gorse (*Ulex europaeus*), aquatic plants including water hyacinth (*Pontederia crassipes*), and wetland plants including flowering rush (*Butomus umbellatus*).

4.8.2. EXISTING CONDITIONS — DEVELOPMENT

Under existing conditions, development impacts vegetation. Construction activities in floodplain and non-floodplain areas impact vegetative habitat quality in the short and long term by removing vegetation to accommodate structures and fill, compacting soils, and creating conditions that favor invasive species colonization. Construction of new development often requires grading and, therefore, the disturbance of topsoil and existing vegetation (EPA 2021). The removal of topsoil and vegetation can accelerate erosion and increase sedimentation in nearby waterways, temporarily impacting habitat quality for floodplain obligate species. Additionally, because plants also filter pollutants from stormwater runoff, projects requiring vegetation removal could further impact water quality and aquatic habitats by reducing stormwater filtration. Development projects that include the placement of structures result in permanent habitat loss within the footprint of the structure where vegetation is no longer able to grow. Although new development often has greater construction impacts, even projects that do not create new impervious surfaces, such as repairs or redevelopments, can still cause ground disturbance. Furthermore, disturbed soils create conditions that favor invasive species colonization, which can reduce habitat suitability for native species by changing the accessibility of key resources such as water, light, and nutrients. Development over time has resulted in conversion of habitat into developed land that is unsuitable for native vegetation species.

Local regulations often require some of these temporarily disturbed areas to be restored to pre-project conditions by replanting native vegetation. Further, developers need to take actions to prevent the spread of invasive species in accordance with state and local laws.

4.8.3. SIGNIFICANCE CRITERIA

The magnitude or intensity of potential adverse impacts or beneficial effects were evaluated based on the criteria shown in **Table 4.4**. An alternative would result in significant adverse impacts on vegetation resources if it meets one or more of the following criteria:

- Substantially impairs the three floodplain functions of flood storage, water quality, or vegetation, or does not substantially achieve the no net loss of those three floodplain functions.
- Conflicts with existing federal, state, or local natural resource laws or regulations.
- Substantially reduces the presence of wetlands, riparian habitat, or other sensitive natural communities important for biological resources beyond what is reasonably expected from development under existing conditions.
- Substantially alters the suitability or connectivity of floral habitats, including sensitive natural areas or other biologically important areas (e.g. old-growth forests and wetlands).

4.8.4. IMPACTS COMMON TO ALL ALTERNATIVES

The amount of development in the Oregon plan area is expected to remain the same in NFIP-participating communities under all alternatives. Regardless of the alternative, development and associated ground-disturbing activities would have some common impacts on vegetation, discussed

in existing conditions (Section 4.9.2). Under the action alternatives, there would be additional ground-disturbing activities to implement the no net loss standards in the SFHA.

Across all alternatives and project types, including those with and without a federal nexus, construction activities would be expected to result in localized short-term adverse impacts on vegetation. These general effects of development would occur under all alternatives because the total amount of development is expected to be the same under each alternative and to occur based on population growth and economic drivers. However, the impact by vegetation category may vary as described below.

4.8.5. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. Because implementation of the NFIP would remain unchanged, there would be no change in impacts on vegetation compared to existing conditions (Section 4.8.2). However, as discussed in Section 3.2, implementation of the NFIP in the Oregon plan area as described in Section 1.3 would not include additional steps NMFS identified in the 2016 BiOp as necessary to avoid the destruction or adverse modification of designated or proposed critical habitat and adverse impacts on EFH from vegetation removal and habitat conversion. Thus, based on NMFS' determination in the 2016 BiOp, the adverse impact from vegetation removal and habitat conversion may be expected to result in continued **major long-term significant adverse impacts**.

4.8.6. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. Development that implements the no net loss standards would maintain flood storage capacity, pervious surface, and trees, as well as the ecosystem services they provide (e.g., groundwater recharge). Development with project-specific ESA compliance could continue to impact these functions and associated ecosystem services while still obtaining ESA compliance. The short-term and long-term impacts on vegetation from construction activities for development with project-specific ESA compliance would occur consistent with existing conditions described in Section 4.8.2.

Implementation of the no net loss standards to create replacement flood storage would result in increased construction impacts compared to existing conditions, and therefore, the No Action Alternative. This would adversely impact floodplain transitional and floodplain obligate vegetation in the short-term. The removal of topsoil would make revegetation more difficult and would create conditions conducive to the spread of invasive species. As discussed in Section 4.6.6, constructing replacement flood storage would alter how surface runoff flows across the landscape. Changes to water flow and absorption associated with replacement flood storage could increase the risk of invasive species spread and affect native vegetation species. Therefore, actions to implement the no net loss standards could have **localized minor short- and long-term adverse impacts** on floodplain obligate and floodplain transitional vegetation in the SFHA from increased ground disturbance to implement the no net loss standards and the potential for flood storage to alter floodplain dynamics.

However, in the long-term, the no net loss standards would be expected to offset the loss of vegetation floodplain functions from construction activities. For instance, replacement flood storage areas would be planted with non-invasive vegetation and actions subject to beneficial gain would revegetate an area with native riparian herbaceous, shrub, and tree species. If the replacement flood storage area was previously dominated by invasive plant species, this mitigation action could improve the quality of the vegetative community by removing the invasive species during construction and replanting with native plants.

The no net loss standard for tree replacement in the SFHA could increase the total number of trees in an area due to the greater than 1 to1 mitigation ratio for removal of trees with a 6-inch dbh or larger. The mitigation ratios account for the temporal effect of replanting trees that are smaller than those removed and for the fact that some planted trees would not survive to maturity. Because it would take time for newly planted trees to mature to the same size as those removed, and thus, provide the same functions as the trees that were removed, more trees are required to be planted than would be removed to achieve no net loss. Further, mitigation ratios for tree replacement under no net loss would only be beneficial to vegetation communities in the long-term as surviving trees grow to maturity. Thus, there would be a potential **negligible long-term beneficial effect** compared to the No Action Alternative from tree replacement mitigation, as trees mature.

Some development may be influenced to move to areas outside of the SFHA because of the increased cost and complexity (e.g., design, review, permitting) of implementing the no net loss standards. Development that shifts to non-SFHA areas would adversely impact floodplain transitional and non-floodplain vegetation consistent with effects of development described under existing conditions (Section 4.8.2). Per Oregon state land use laws and regulations (OAR 660-024, see Section 1.2.1 and Section 4.2.1), development outside the SFHA would likely occur primarily within UGBs, where habitats are already affected by human activity. However, if more developers choose to locate their projects outside of the SFHA into the UGB, then the UGB might be expanded into nearby undeveloped areas sooner than planned under existing conditions. Therefore, there may be **localized minor long-term adverse impacts** on floodplain transitional and non-floodplain vegetation if development patterns shift to non-floodplain habitat and potentially affect previously undisturbed areas. There may be **localized minor long-term beneficial effect** on floodplain obligate vegetation compared to the No Action Alternative if development was influenced to shift to locations outside the SFHA. Overall, impacts on vegetation under Alternative 2 would **not be significant** because most development activities in the SFHA would offset vegetation loss through implementation of no net loss standards.

4.8.7. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. As such, the no net loss standards under Alternative 3 would apply to approximately 16 percent more projects within the SFHA than under Alternative 2 (Section 4.1.1.3). Thus, construction impacts associated with the no net loss standards would increase in the SFHA under Alternative 3 as compared to Alternative 2 (impacts on vegetation from construction activities are described in Section 4.8.2). As with

Alternative 2, replacement flood storage sites that capture floodwaters at a ratio of greater than 1 to 1 may alter the flow of floodwaters, which could affect vegetation species. Therefore, actions to implement the no net loss standards could have **localized minor to moderate short- and long-term adverse impacts** on floodplain obligate and floodplain transitional vegetation in the SFHA from increased ground disturbance to implement no net loss and the potential for flood storage to alter floodplain dynamics. The impact would be slightly greater than under Alternative 2.

Under Alternative 3, the tree replacement standards would apply to approximately 16 percent more development projects in the SFHA than under Alternative 2. However, replanted trees take time to establish, grow, and provide the equivalent benefits of mature trees. Therefore, compared to the No Action Alternative where no net loss of vegetation would not be implemented, there would be **negligible long-term beneficial effect** on vegetation, as trees mature.

The expanded applicability of the no net loss standards under Alternative 3 could influence developers to locate development outside the SFHA to avoid added cost and complexity of project implementation. This would reduce the impacts of development on floodplain transitional and floodplain obligate vegetation communities in the SFHA. Per Oregon state land use laws and regulations (OAR 660-024, see Section 1.2.1 and Section 4.2.1), development that occurs outside the SFHA would likely occur primarily within UGBs, where habitats are already affected by human activity. However, as with Alternative 2, if more developers choose to locate their projects outside of the SFHA in the UGB, then the UGB might be expanded into nearby undeveloped areas sooner than planned under existing conditions. Similar to Alternative 2, **localized minor long-term adverse impacts** on floodplain transitional and non-floodplain vegetation species may occur under Alternative 3 as a result of development that may be influenced to locate outside of the SFHA. There may be a **localized minor long-term beneficial effect** on floodplain obligate vegetation compared to the No Action Alternative due to development that may be influenced to locate outside the SFHA. Adverse impacts would **not be significant** as vegetation loss would be offset in the SFHA due to implementation of no net loss standards.

4.9. Terrestrial Wildlife

Terrestrial wildlife refers to animals and species that primarily live on land, including mammals, birds, reptiles, and insects. Terrestrial wildlife plays a vital role in maintaining ecological balance, contributing to pollination, seed dispersal, pest control, and nutrient cycling. Human activities can disrupt habitats, migration routes, and food sources, leading to population declines or shifts in local biodiversity. Impacts on terrestrial wildlife including changes to ecosystem structure and function, habitat loss, and species displacement are regulated at the federal and state levels. Additional details on terrestrial wildlife, including regulatory context, existing conditions, analysis methodology, and impacts is available in the *Biological Resources Technical Report* (Appendix H).

The Migratory Bird Treaty Act of 1918 (MBTA), as amended, 16 U.S.C. §§ 703–712, protects migratory birds and their nests, eggs, and body parts from harm, sale, or other injurious actions. The MBTA protects all native birds, including common species. A migratory bird is any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their

annual life cycle. Any type of project, governmental or private, that is likely to result in the purposeful taking of birds protected under the MBTA would require the issuance of permits from USFWS.

The Bald and Golden Eagle Protection Act (BGEPA) of 1940, 16 U.S.C. §§ 668 et seq., prohibits the take, possession, sale, or other harmful action on any golden eagle (*Aquila chrysaetos*) or bald eagle (*Haliaeetus leucocephalus*), alive or dead, including any part, nest, or egg (16 U.S.C. § 668(a)). The BGEPA requires consultation with USFWS to ensure that proposed actions of any type of project, governmental or private, do not adversely affect bald or golden eagles. Project activities may be required to avoid certain seasons or buffer areas around nesting eagles.

ESA-listed terrestrial species that may occur in the Oregon plan area are discussed in Section 4.11.

4.9.1. EXISTING CONDITIONS

As previously discussed in Section 4.8.1, because the habitat conditions within the Oregon plan area are so diverse, a multitude of fish and wildlife species have the potential to use different kinds of habitats within the Oregon plan area. Terrestrial species with the potential to occur in the Oregon plan area are categorized into one of two broad categories describing their use of floodplain habitats: Floodplain Transitional and Non-Floodplain. These floodplain categories are used to discuss the potential effects of the proposed action on terrestrial wildlife in the Oregon plan area. The categories are defined as follows:

- **Floodplain Transitional:** This category includes species that are sometimes found in floodplains and sometimes found in non-floodplain areas. Species in this category have habitat requirements that are not dependent on floodplain areas. This includes species that 1) may use the floodplain transiently, such as large mammal species, or 2) primarily rely on habitat characteristics that do not depend on floodplain functions or features (such as species that may occur within or outside of floodplains, or species that inhabit vernal pools that may form within or outside of floodplains). This category includes most species of mammals, birds, insects, arachnids, and some amphibians.
- **Non-Floodplain:** This category includes wildlife species that require drier, upland habitats, and that are not expected to occur within floodplain areas. Species in this category include some mammals, birds, reptiles, insects, and arachnids.

Although wildlife is generally categorized by floodplain use for the purpose of analysis, the varied topography and weather in Oregon support a great diversity of species within the plan area. Every species is unique, and even within the same species, individual animals may respond differently to environmental pressures depending on their specific geographic and climatic conditions. Differences in wildlife communities by ecoregion are discussed more in the *Biological Resources Technical Report* (Appendix H).

In addition to native wildlife species, this EIS also considers the proliferation of invasive terrestrial wildlife species. Invasive terrestrial wildlife species are those that are not native to Oregon and compete with native terrestrial wildlife species for habitat and food. In addition to competing with

native species, invasive species may also prey on native species. Based on a review of desktop resources, there are 14 invasive terrestrial wildlife species of particular concern within the plan area. These species include the European starling (*Sturnus vulgaris*), black rat (*Rattus rattus*), and feral swine (*Sus scrofa*).

4.9.2. EXISTING CONDITIONS — DEVELOPMENT

As described in the vegetation analysis (Section 4.8.2), development activities impact terrestrial habitats through construction disturbance and long-term conversion of habitat into developed areas, which in turn affects floodplain transitional and non-floodplain wildlife species. Terrestrial wildlife species, particularly those with specific migration routes or large ranges, are also impacted by reduced habitat connectivity as a consequence of development. Significant barriers to migration and dispersal can lead to isolation, loss of genetic diversity, and increased mortality.

Per Oregon state land use laws and regulations (OAR 660-024, see Section 1.2.1 and Section 4.2.1), development activities occur primarily within UGBs, which limits the potential long-term impacts on terrestrial wildlife species from habitat conversion. Wildlife that inhabit UGBs is generally accustomed to human activity or modified environments. As a result, visual and auditory disturbances from construction projects in these developed or development adjacent habitats are less likely to significantly impact local wildlife. However, construction-related auditory and visual disturbances could still result in altered or disrupted foraging, breeding, or resting behaviors that could affect the health of more sensitive floodplain transitional and non-floodplain wildlife. Wildlife can also be affected by the physical disturbance of construction activities related to vegetation clearing, soil disturbance, and vehicle traffic. Floodplain transitional and non-floodplain wildlife may become stressed by disturbances and may be forced to relocate as a result. Wildlife forced to relocate may struggle to find unoccupied habitats of similar quality, and the process of relocating requires increased energy expenditures, which makes wildlife more susceptible to disease and predation.

4.9.3. SIGNIFICANCE CRITERIA

An alternative would result in significant *adverse impacts* on terrestrial wildlife if it meets one or more of the following criteria:

- Substantially impairs the three floodplain functions of flood storage, water quality, or vegetation, or does not substantially achieve the no net loss of those three floodplain functions.
- Conflicts with existing federal, state, or local natural resource laws or regulations.
- Substantially reduces the presence of wetlands, riparian habitat, or other sensitive natural communities important for biological resources beyond what is reasonably expected from development under existing conditions.
- Substantially alters the suitability or connectivity of floral or faunal habitats, including sensitive natural areas or other biologically important areas (e.g. old-growth forests; stopover, resting areas, and flyways for migratory birds; and wetlands).

4.9.4. IMPACTS COMMON TO ALL ALTERNATIVES

As discussed in Section 4.1.1.1, the amount of development in the Oregon plan area is expected to remain the same in NFIP-participating communities under all alternatives. Regardless of the alternative, development activities would have some common effects on terrestrial habitats and floodplain transitional and non-floodplain wildlife species, as described under existing conditions (Section 4.8.2 and Section 4.9.2).

Across all alternatives and project types, including those with and without a federal nexus, construction activities would be expected to result in localized short-term adverse impacts on terrestrial wildlife. These general effects of development would occur under all alternatives because the total amount of development is expected to be the same under each alternative and to occur based on population growth and economic drivers.

4.9.5. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. Because implementation of the NFIP would remain unchanged, there would be no change in impacts on floodplain transitional and non-floodplain wildlife compared to existing conditions (Section 4.9.2). Because the No Action Alternative would not change impacts on floodplain transitional and non-floodplain wildlife compared to existing conditions, the NEPA finding for non-floodplain wildlife is **no impact** compared to existing conditions.

However, as discussed in Section 3.2, implementation of the NFIP in the Oregon plan area as described in Section 1.3 would not include additional steps NMFS identified in the 2016 BiOp as necessary to avoid adverse impacts on floodplain habitat, which supports some floodplain transitional species. Thus, based on NMFS' determination in the 2016 BiOp, the adverse impact on floodplain functions may be expected to result in continued **major and significant long-term adverse impacts** on floodplain transitional species.

4.9.6. ALTERNATIVE 2

Under Alternative 2, developers would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. Development with project-specific ESA compliance could continue to impact the three floodplain functions and associated ecosystem services while still obtaining ESA compliance. The short-term and permanent effects on terrestrial wildlife from construction activities for development with project-specific ESA compliance would occur consistent with existing conditions described in Section 4.8.2 and Section 4.9.2.

Most development that remains in the SFHA would be required to implement the no net loss standards as applicable, which would result in increased construction impacts on floodplain transitional wildlife in the short-term as compared to existing conditions (described in Section 4.9.2 and Section 4.10.2), and therefore, the No Action Alternative. This would occur because of the increase in ground disturbance associated with no net loss mitigation (Section 4.8.6). Further, as discussed in Section 4.7.6 and Section 4.8.6, replacement flood storage sites may capture

floodwaters that would have otherwise flowed into nearby areas, which could affect habitat for floodplain transitional species. However, tree replacement, pervious surface standards, vegetation associated with replacement flood storage, and RBZ beneficial gain plantings as applicable would help offset the impacts of development in the long term by maintaining important ecological functions for floodplain transitional wildlife species. Thus, there would be **minor short-term adverse impacts** and **minor long-term beneficial effects** for floodplain transitional wildlife compared to the No Action Alternative due to the implementation of no net loss standards in the SFHA.

It is expected that some development could be influenced to occur outside of the SFHA because the implementation of no net loss standards is expected to increase the cost and complexity of projects in the SFHA. This change in development patterns could reduce the extent of development within the SFHA, which, compared to the No Action Alternative, could result in **localized negligible long-term beneficial effects** on floodplain transitional wildlife by reducing conversion of habitat to development in the SFHA.

Development that is influenced to move to non-SFHA areas would adversely impact non-floodplain and floodplain transitional wildlife consistent with impacts discussed in Section 4.9.2 and Section 4.10.2. Per Oregon state land use laws and regulations, development outside the SFHA would likely occur primarily within UGBs, where habitats are already affected by human activity. However, if more developers choose to locate their projects outside of the SFHA into the UGB, then the UGB might be expanded into nearby undeveloped areas sooner than planned under existing conditions and the No Action Alternative (land use, Section 4.2.5). Therefore, there would be **localized minor to moderate long-term adverse impacts** on floodplain transitional and non-floodplain wildlife from development occurring in non-floodplain habitat and potentially affecting previously undisturbed areas. Additionally, Alternative 2 would be expected to result in **regional negligible to minor long-term adverse impacts** from potential expansion of UGBs. Overall, impacts on terrestrial wildlife under Alternative 2 would **not be significant** because the amount of development that may be influenced to occur in non-SFHA areas would not be substantial and it would generally be within the UGB and likely clustered around areas that are already developed.

4.9.7. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. Implementation of no net loss standards under Alternative 3 would apply to approximately 16 percent more projects within the SFHA than under Alternative 2 because projects with a federal nexus would also implement the no net loss standards (Section 4.1.1.3).

As such, construction impacts (as described in Section 4.9.2) would increase in the SFHA under Alternative 3 compared to Alternative 2. In the short-term, this would increase habitat disturbance for floodplain transitional wildlife species. However, in the long-term, the implementation of no net loss standards is expected to prevent the loss of floodplain functions and could offset some impacts on habitat. Even still, as with Alternative 2, replacement flood storage sites may capture floodwaters that would have otherwise flowed into nearby areas, which could affect habitat for floodplain

transitional species. Therefore, **minor to moderate short-term adverse impacts** on floodplain transitional wildlife species would occur. However, floodplain transitional wildlife could experience **minor to moderate long-term beneficial effects** compared to the No Action Alternative due to the implementation of the no net loss standards, which would include mitigation measures that benefit habitat, such as tree replacement.

Because the no net loss standards would apply to approximately 16 percent more developments within the SFHA than under Alternative 2, more developments may be influenced to occur outside of the SFHA. This potential change in development patterns would further reduce the extent of development and associated conversion of habitat within the SFHA. Therefore, compared to the No Action Alternative, the potential shift of development activity to locations outside of the SFHA would have **localized negligible long-term beneficial effects** on floodplain transitional species within the SFHA.

As with Alternative 2, this change in development patterns could lead to increased localized impacts on terrestrial habitats and non-floodplain species outside the SFHA. Though the majority of development would still occur within UGBs, or areas already disturbed by human activity, habitat disturbance could have **localized minor short-term adverse impacts** on non-floodplain wildlife species. Implementation of Alternative 3 would be expected to result in **regional negligible to minor long-term adverse impacts** from potential expansion of UGBs and **localized minor to moderate adverse impacts** on non-floodplain species and habitat. The impacts would be slightly greater than under Alternative 2, but overall, impacts on terrestrial wildlife under Alternative 3 would **not be significant** because the amount of development that may occur in non-SFHA areas would still not be substantial and it would generally be within the UGB and likely clustered around areas that are already developed.

4.10. Fish and Aquatic Wildlife

Aquatic wildlife include species that live in freshwater or marine environments, such as fish, mammals, amphibians, invertebrates, and other organisms adapted to aquatic habitats. These species play essential roles in ecosystems, affecting nutrient cycles and water quality. Impacts on fish and aquatic wildlife such as habitat alteration, pollution, and disruption of spawning and migration routes are regulated at the federal and state levels. Additional details on fish and aquatic wildlife, including regulatory context, existing conditions, analysis methodology, and impacts is available in the *Biological Resources Technical Report* (Appendix H).

The MSA (16 USC 1801-1884) establishes a national program for the conservation and management of fishery resources. A critical component of this program is the designation of Essential Fish Habitat (EFH), which are the waters and substrate necessary for fish to spawn, breed, feed, and grow to maturity. EFH encompasses various aquatic environments including rivers, lakes, and estuaries, which are vital for the sustainability and productivity of fish populations. If impacts on EFH are identified for a proposed development with a federal nexus, federal agencies are required to consult with the Secretary of Commerce through NMFS to determine whether their actions may adversely affect EFH.

The Marine Mammal Protection Act (16 USC 1361 et seq.) protects all marine mammal species in U.S. waters. The act prohibits the "take" of marine mammals, defined as harassing, hunting, capturing, collecting, or killing, in U.S. waters and by U.S. citizens on the high seas, with limited exceptions. NMFS may authorize the "take" of marine mammals for activities such as scientific research, commercial or educational photography, incidental takes during commercial fishing, and certain non-fishery commercial projects like construction. Compliance is required for all types of projects, both governmental and private.

ODFW also maintains established laws and guiding regulations, including in-water timing guidelines and fish passage requirements. It is a policy of the State of Oregon to provide upstream and downstream passage for native migratory fish species in all waters where these fish were historically or are presently located. The ODFW Fish Passage Program administers the state's fish passage policy as required in ORS 509.585 and corresponding administrative rules in ORS 635-412-0005 through 0065. This law, adopted in 2001, requires fish passage be addressed at all artificial obstructions, regardless of size or ownership, at the time of specific events including construction, replacement, abandonment, or a fundamental change in permit status at an artificial obstruction. ODFW is required to review and approve all fish passage plans prior to these events.

ESA-listed fish and aquatic species that may occur in the vicinity of the Oregon plan area are discussed in Section 4.11.

4.10.1. EXISTING CONDITIONS

As previously discussed in Section 4.8.1, because the habitat conditions within the Oregon plan area are so diverse, a multitude of aquatic species have the potential to use different kinds of habitats within the Oregon plan area. Aquatic species with the potential to occur in the Oregon plan area are categorized into one broad category based on their use of floodplain habitats: Floodplain Obligate. This floodplain category is used to discuss the potential effects of the proposed action on aquatic species in the Oregon plan area. The category is defined as follows:

- **Floodplain Obligate:** This category includes species that rely entirely on streams and the adjacent floodplain habitat areas. Species in this category include aquatic and semiaquatic species that rely on both the underwater portions of streams and the adjacent riparian areas in the floodplain. Species that are found in coastal floodplains and marine environments are included in this category as well. All fish and aquatic mollusks, most amphibians, some reptiles, and some mammals are generally included in this category.

Although wildlife is generally categorized by floodplain use for the purpose of analysis, the varied topography and weather in Oregon support a great diversity of species within the plan area. Every species is unique, and even within the same species, individual animals may respond differently to environmental pressures depending on their specific geographic and climatic conditions. Differences in wildlife communities by ecoregion are discussed more in the *Biological Resources Technical Report* (Appendix H).

In addition to native species, the success and proliferation of invasive floodplain obligate species is considered as well. Invasive fish and aquatic wildlife species are those that are not native to Oregon and compete with native species for habitat and food. In addition to competing with native species, invasive species may also prey on native species. Based on a review of desktop resources, there are 27 invasive fish and aquatic wildlife species of particular concern within the plan area. These species include but are not limited to the common carp (*Cyprinus carpio*), nutria (*Myocastor coypus*), American bullfrog (*Lithobates* [*Rana*] *catesbeinanus),* and red-eared slider (*Trachemys scripta elegans*).

4.10.2. EXISTING CONDITIONS — DEVELOPMENT

As described for vegetation in Section 4.9.2, development activities can impact floodplain habitat during construction and from long-term conversion of habitat into developed areas, which in turn affects fish and aquatic wildlife species. These general impacts of development would affect floodplain obligate species that use floodplain habitats adjacent to aquatic habitats for part of their lifecycle. Construction activities in the water would have additional impacts on floodplain obligate species.

Where construction requires in-water work or dewatering, fish and other floodplain obligate species can be denied passage during construction and dewatering activities, and can experience isolation or depletion, be injured, or even die. Pile driving or other in-water work causes noise disturbances that would injure or disorient aquatic wildlife occupying the area at the time of construction. If a project involves the construction, replacement, abandonment, or a fundamental change in permit status at an artificial obstruction, fish passage is required to be provided in accordance with Oregon Fish Passage law.

The potential impairment of water quality from construction within or near aquatic habitats could render some portions of aquatic habitat unsuitable for species that were present at the start of construction. Vegetation removal could damage or destroy crucial physical habitat features that many species at different life stages rely on, such as root systems that protrude into streams and large woody material that accumulates in the water. The loss of these crucial microhabitats may result in lower survival rates of certain species, especially early life stages such as eggs and juveniles.

As described in Section 1.5, NMFS concluded in their 2016 BiOp that the implementation of the NFIP in the Oregon plan area will have adverse effects on EFH for Pacific salmon, coastal pelagic species, highly migratory species, and groundfish as protected under the MSA (NMFS 2016a). Therefore, under existing conditions, the construction of new development is considered to impair aquatic habitats and impact species within the plan area.

4.10.3. SIGNIFICANCE CRITERIA

An alternative would result in significant adverse impacts on fish and aquatic wildlife if it meets one or more of the following criteria:

- Substantially impairs the three floodplain functions of flood storage, water quality, or vegetation, or does not substantially achieve the no net loss of those three floodplain functions.
- Conflicts with existing federal, state, or local natural resource laws or regulations.
- Substantially reduces the presence of wetlands, riparian habitat, or other sensitive natural communities important for biological resources beyond what is reasonably expected from development under existing conditions.
- Substantially alters the suitability or connectivity of faunal habitats, including sensitive natural areas or other biologically important areas (e.g. old-growth forests; stopover, resting areas, and flyways for migratory birds; fish migration pathways; EFH; and wetlands).

4.10.4. IMPACTS COMMON TO ALL ALTERNATIVES

As discussed previously, the amount of development in the Oregon plan area is expected to remain the same in NFIP-participating communities under all alternatives. Regardless of the alternative, development activities would have some common effects on fish and aquatic wildlife species, as described under existing conditions (Section 4.8.2, Section 4.10.2).

Across all alternatives and project types, including those with and without a federal nexus, construction activities would be expected to result in localized short-term adverse impacts on floodplain obligate wildlife. These general effects of development would occur under all alternatives because the total amount of development is expected to be the same under each alternative and to occur based on population growth and economic drivers.

4.10.5. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. As discussed in Section 3.2, implementation of the NFIP in the Oregon plan area under the No Action Alternative would not include additional steps to address NMFS' 2016 BiOp finding of adverse effects on EFH for Pacific salmon, coastal pelagic species, highly migratory species, and groundfish as protected under the MSA (NMFS 2016a). Therefore, the No Action Alternative may have a **major and significant long-term adverse impact** on floodplain obligate species and habitat because impacts would continue to occur as under existing conditions, which NMFS determined would have adverse effects on EFH.

4.10.6. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. Development with project-specific ESA compliance could continue to impact floodplain functions and the ecosystem services they provide while still complying with a project-specific ESA compliance process. The short-term effects of construction activities and permanent effects of development on fish and aquatic wildlife for development with project-specific ESA compliance would occur consistent with existing conditions described in Section 4.8.2 and Section 4.10.2.

Most development that remains in the SFHA would be required to implement the no net loss standards as applicable, which would result in increased short-term construction impacts on floodplain obligate species at the localized scale as compared to existing conditions (described in Section 4.8.2 and Section 4.10.2) and therefore, the No Action Alternative. No net loss mitigation ratios for trees and pervious surface as well as vegetation of replacement flood storage sites and RBZ beneficial gain plantings as applicable would help maintain important ecological functions for floodplain obligate species over the long term. As discussed in Section 4.7.6, replacement flood storage at ratios of more than one to one may capture floodwaters that may have otherwise flowed into nearby areas. This could lead to a reduction in aquatic habitat quality and connectivity in certain areas. Therefore, depending on the scale of the project, construction disturbance related to mitigation requirements could lead to **localized minor to moderate short-term adverse impacts** on aquatic wildlife and **minor to moderate long-term adverse impacts** on aquatic habitat connectivity, migration routes, and connectivity.

However, in the long-term, implementation of the no net loss standards would be expected to offset the loss of floodplain functions and habitat, as described in Section 4.9.6. Additionally, because some development may be influenced to occur outside the SFHA under Alternative 2, there would be beneficial effect on floodplain obligate species compared to the No Action Alternative. Overall, Alternative 2 would be expected to have **moderate to major long-term beneficial effects** for floodplain obligate species within the SFHA compared to the No Action Alternative. Adverse impacts on fish and aquatic wildlife under Alternative 2 **would not be significant** because floodplain functions in the SFHA would be maintained for the subset of applicable developments with implementation of no net loss standards.

4.10.7. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. Implementation of the no net loss standards under Alternative 3 would apply to approximately 16 percent more projects within the SFHA than under Alternative 2 because projects with a federal nexus would also need to implement the no net loss standards (Section 4.1.1.3).

Under Alternative 3, there would be more construction impacts related to implementation of the no net loss standards compared to existing conditions (Section 4.10.2), the No Action Alternative, and Alternative 2. At the localized scale, this would increase habitat disturbance for floodplain obligate wildlife species. However, in the long-term at a regional or Oregon plan area scale, implementation of the no net loss standards would be expected to offset the potential loss of the three floodplain functions, which are imperative for ecosystem functionality in floodplain habitats. By maintaining floodplain habitat, the no net loss standards support the survival and success of floodplain obligate species. Even still, as with Alternative 2, replacement flood storage may capture floodwaters that may have otherwise flowed into nearby areas, potentially affecting aquatic habitat functions, migration routes, and connectivity. The impact would be slightly greater as the no net loss standards would be applied more broadly than under Alternative 2. Thus, Alternative 3 would have a **localized moderate short-term adverse impact** on floodplain obligate species and habitat and a **moderate**

long-term adverse impact on aquatic habitat connectivity and migration routes from implementation of the no net loss standards, particularly flood storage, which could result in changes in floodplain dynamics.

Implementation of the no net loss standards under Alternative 3 may be more likely to influence development to occur outside of the SFHA because only a portion of projects with a federal nexus would be functionally dependent on their location in a floodplain. Consequently, adverse impacts on aquatic wildlife species in the SFHA would be further reduced as compared to Alternative 2. However, development in the SFHA would continue to occur, including projects that are water dependent or linked to existing developments. Because Alternative 3 would apply the no net loss standards more broadly than Alternative 2, the benefits of maintaining flood storage capacity, pervious surface, and trees would also occur more broadly. Compared to the No Action Alternative, this would result in a **major long-term beneficial effect** on floodplain obligate species. Adverse impacts on floodplain obligate species under Alternative 3 **would not be significant** because floodplain functions in the SFHA would be maintained for all developments with implementation of no net loss standards.

4.11. Threatened and Endangered Species and Critical Habitat

This section describes special-status species with potential to occur in the Oregon plan area. The term "special-status species" is used in this section to refer to species that are 1) listed as threatened or endangered under the ESA, 2) are proposed for listing under the ESA, 3) are listed as threatened or endangered under the Oregon ESA, or 4) are designated as Sensitive (S) and Sensitive-Critical (SC) by the Oregon Sensitive Species Rule.[52] Designated critical habitat for ESA-listed species that occurs within the Oregon plan area is also identified in this section. Additional details on special-status species, including regulatory context, existing conditions, categories and analysis methodology, and impacts is available in the *Biological Resources Technical Report* (Appendix H).

Enacted in 1973, the ESA provides a program for the conservation of ESA-listed species and their habitats. Under Section 7(a)(1), federal agencies, including FEMA, are required to promote the conservation of endangered and threatened species (ESA-listed species). Section 7(a)(2) of the ESA requires federal agencies to ensure that any action they authorize, fund, or carry out is unlikely to jeopardize the continued existence of any ESA-listed species or result in the destruction or adverse modification of designated critical habitat (16 United States Code [U.S.C.] 1536(a)–(d)).

Section 9 of the ESA prohibits the import, export, or take of endangered species for any purpose. The term "take" means to harass, hunt, shoot, capture, trap, kill, collect, wound, harm, or pursue endangered species, or attempt any of these activities. Section 4(d) of the ESA extends Section 9 prohibitions to threatened species. Section 9 and Section 4(d) violations could result in penalties

[52] Sensitive species are not protected under federal or state law. Oregon's Sensitive Species Rule created a "Sensitive Species List," which includes fish and wildlife species that are facing one or more threats to their populations or habitats and need conservation attention. The Sensitive Species List is a primarily nonregulatory tool.

and enforcement under Section 11 of the ESA. Civil penalties and criminal violations may result in fines of up to $25,000 for each violation or result in imprisonment. These penalties could accrue to actions that would take an ESA-listed species, such as land development.

There are some conditions under which take of an ESA-listed species may be authorized. Permits and authorizations, such as an Incidental Take Statement issued under a Section 7(a)(2) consultation or with approval of an HCP under Section 10 of the ESA, allow for the unintentional take of ESA-listed species that may occur through otherwise lawful activities. Such permits and authorizations are issued by NMFS or USFWS for species under their respective jurisdictions.

In 1987, the Oregon Legislature enacted the Oregon ESA, which is governed by the ORS 496.171 through 496.192. These statutes outline the procedure for listing species as threatened or endangered, grant the Oregon Fish and Wildlife Commission the authority to manage threatened and endangered species, and require state agencies to comply with programs to protect and conserve state-listed species. The Oregon ESA does not impose additional requirements or restrictions on the use of private land, including commercial forestland, based solely on the presence of state-listed species; the reach of the Oregon ESA is limited only to state-owned land, state-leased land, and land over which the state has a recorded easement (Oregon Legislature 2012). Additionally, the Oregon ESA defines "take" as actions that would kill or obtain possession or control over state-listed species, which is narrower than the federal ESA's definition of "take." The OARs for threatened and endangered species (OAR 635-100-0100 to 0130) implement these policies. State-listed fish and wildlife fish species are under ODFW jurisdiction (ODFW 2021a), while state-listed plant species are under the ODA jurisdiction (ODA 2024).

Oregon's Sensitive Species Rule provides a proactive approach to species conservation (OAR 635-100-0040). This rule created a "Sensitive Species List," which includes fish and wildlife species that are facing one or more threats to their populations or habitats and need conservation attention. Although the Sensitive Species List is a primarily nonregulatory tool, ODFW's biologists provide reviews of proposed land and water management actions based, in part, on Sensitive Species List priorities. Therefore, a species' inclusion in the Sensitive Species List provides some regulatory oversight and landowner incentives to avoid impacts.

The Sensitive Species List is divided into two categories: Sensitive (S) and Sensitive-Critical (SC). Several factors are considered when designating a species as S, including declining populations, the active or imminent deterioration of primary habitats, disease, predation, contaminants, and other natural or human-caused threats. Overutilization, inadequate management of conservation programs, and naturally limited range or rarity of occurrence also contribute to a species' designation as S. Species designated as SC are of particular conservation concern and face current or historical threats that significantly impact their abundance, distribution, diversity, or habitat. Without appropriate conservation measures, SC species may decline further, potentially reaching the threshold for classification as threatened or endangered (OAR 635-100-0040).

The Oregon Conservation Strategy (OCS) is the guiding document describing the State of Oregon's approach to conserving fish and wildlife species. The goals of the OCS are to maintain healthy fish

and wildlife populations by maintaining and restoring functioning habitats, preventing declines of at-risk species, and reversing species declines where possible (ODFW 2016). While it is not a regulation, the OCS provides a comprehensive plan that encourages and guides voluntary conservation efforts across the state. All ESA-listed species under NMFS and USFWS jurisdiction are identified in the OCS as "strategy" species. The OCS also includes additional strategy species and habitats that the State of Oregon has identified as high priority to protect and conserve. Many of these strategy species are also included in the State of Oregon's Sensitive Species List.

4.11.1. EXISTING CONDITIONS

The varied topography and weather in Oregon support a great diversity of special-status species within the plan area. Every species is unique, and even within the same species, individual plants or animals may respond differently to environmental pressures depending on their specific geographic and climatic conditions. Differences in special-status species by ecoregion are discussed further in the *Biological Resources Technical Report* (Appendix H).

Based on a review of the USFWS Information for Planning and Consultation tool (USFWS 2024); NMFS Species and Habitat App (NFMS 2024); the OCS (ODFW 2016); the ODFW Sensitive Species List (ODFW 2021b); and the ODFW Threatened, Endangered, and Candidate Fish and Wildlife Species in Oregon list (ODFW 2021a), 33 fish, 61 bird, 31 mammal, 10 reptile, 17 amphibian, 4 insect, 1 mollusk, and 1 crustacean special-status species have the potential to occur in the Oregon plan area. Of these special-status species, there are 54 species or distinct population segments (DPSs) that are listed or proposed for listing under the ESA. Critical habitat has been designated for 29 species or DPSs within the Oregon plan area. Additionally, there are 56 plant special-status species that have the potential to occur in the Oregon plan area. Of these special-status plant species, there are 11 species that are listed or proposed for listing under the ESA. Critical habitat has been designated for two species within the Oregon plan area. The *Biological Resources Technical Report* (Appendix H) presents the ESA-listed and proposed species and designated critical habitats that occur within the Oregon plan area in **Table 3.2** and **Table 3.3** of the technical report.

Special-status species with the potential to occur in the Oregon plan area are categorized into one of three broad categories describing their use of floodplain habitats. These floodplain categories are used to discuss the potential effects of the proposed action on special-status species and their habitats in the Oregon plan area. The categories are defined as follows:

- **Floodplain Obligate:** This category includes species that rely entirely on streams and the adjacent floodplain habitat areas. Species in this category include aquatic and semiaquatic species that rely on both the underwater portions of streams and the adjacent riparian areas in the floodplain. Species include western lily (*Lilium occidentale*), eulachon (*Thaleichthys pacificus*), and northwestern pond turtle (*Actinemys marmorata*).
- **Floodplain Transitional:** This category includes species that are sometimes found in floodplains and sometimes found in non-floodplain areas. Species in this category have habitat requirements that are not dependent on floodplain areas. This includes species that 1) may use

the floodplain only in particular life stages, or 2) primarily rely on habitat characteristics that do not depend on floodplain functions or features (such as vegetation types that may occur within or outside of floodplains, or species that inhabit vernal pools that may form within or outside of floodplains). Species include white topped aster (*Sericocarpus rigidus*), gray wolf (*Canis lupus*), and monarch butterfly (*Danaus plexippus*).

- Non-Floodplain: This category includes wildlife species that require drier, upland habitats, and that are not expected to occur within floodplain areas. Species include whitebark pine (*Pinus albicaulis*), kit fox (*Vulpes macrotis*), and burrowing owl (*Athene cunicularia hypugaea*).

4.11.2. EXISTING CONDITIONS — DEVELOPMENT

As described under existing conditions for vegetation, terrestrial wildlife, and aquatic wildlife (Section 4.8.2, 4.9.2, and 4.10.2, respectively), development has some common effects on terrestrial and aquatic habitats, and thus on special-status species. NMFS determined in their 2016 BiOp that the current implementation of the NFIP within the Oregon plan area is likely to jeopardize the existence of the Southern Resident killer whale, as well as 16 ESA-listed fish species and adversely modify designated critical habitats (NMFS 2016a) (see Attachment 1 in the *Biological Technical Report* (Appendix H) for the complete list of species). Therefore, under existing conditions, based on the NMFS 2016 BiOp, development is impairing floodplain habitats and impacting species within the Oregon plan area.

4.11.3. SIGNIFICANCE CRITERIA

The magnitude or intensity of potential adverse impacts or beneficial effects were evaluated based on the criteria shown in Table 4.4. An alternative would result in adverse impacts on special-status species if it meets one or more of the following criteria:

- Substantially impairs the three floodplain functions of flood storage, water quality, or vegetation, or does not substantially achieve the no net loss of those three floodplain functions.
- Conflicts with existing federal, state, or local natural resource laws or regulations.
- Substantially reduces the presence of wetlands, riparian habitat, or other sensitive natural communities important for biological resources beyond what is reasonably expected from development under existing conditions.
- Substantially alters the suitability or connectivity of floral or faunal habitats, including sensitive natural areas or other biologically important areas (e.g. old-growth forests; stopover, resting areas, and flyways for migratory birds; fish migration pathways; habitat for special-status species; and wetlands).
- Jeopardizes the continued existence of ESA-listed species or results in the destruction or adverse modification of designated or proposed critical habitat.

4.11.4. IMPACTS COMMON TO ALL ALTERNATIVES

Regardless of the alternative, the amount of development in the Oregon plan area would be expected to remain the same in NFIP-participating communities under all alternatives. Across all alternatives and project types, including those with and without a federal nexus, construction activities would be expected to result in localized short-term adverse impacts on special-status species. These general effects of development would occur under all alternatives because the total amount of development is expected to be the same under each alternative and to occur based on population growth and economic drivers.

Construction activities and developments carried out, permitted, funded, or authorized by federal agencies are required to comply with the applicable federal and state regulations. Before approving federal actions, permits, or funding, the federal action agency would determine whether a project has the potential to cause adverse impacts on ESA-listed species or designated critical habitats. For projects with no effect, the agency would document that in an ESA compliance memo. For projects that are not likely to cause adverse impacts on ESA-listed species, the federal action agency may use a programmatic biological opinion or choose informal consultation with USFWS, NMFS, or both, to determine the appropriate path for compliance. For projects with the potential to cause adverse impacts, the federal action agency would consult with USFWS, NMFS, or both, as required under Section 7(a)(2) of the ESA. Through this consultation process, mitigation would be incorporated into the project as determined appropriate. Therefore, regardless of the impact determination, the effects of development projects on ESA-listed species, designated critical habitat, or both, would be addressed through the ESA compliance process.

Projects without a federal nexus are not subject to the same federal regulations as those with a federal nexus as discussed in Section 1.1.2.

4.11.5. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. As discussed in Section 3.2, implementation of the NFIP in the Oregon plan area under the No Action Alternative would not include additional steps NMFS determined in its 2016 BiOp as necessary to address jeopardy of ESA-listed species and Southern Resident killer whale or the destruction or adverse modification of designated critical habitat. Therefore, the No Action Alternative may have a **major and significant long-term adverse impact** based on NMFS' 2016 BiOp determination that the continued existence of ESA-listed species or their critical habitat would remain in jeopardy.

4.11.6. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. Development with project-specific ESA compliance could continue to impact floodplain functions and the ecosystem services they provide while still complying with a project-specific ESA compliance process. The short-term effects of construction activities and permanent effects of development on special-

status species and their habitat for development with project-specific ESA compliance would occur consistent with existing conditions for vegetation, terrestrial wildlife, and aquatic wildlife described in Section 4.9.2, 4.10.2, and 4.11.2.

Most development that remains in the SFHA would be required to implement the no net loss standards as applicable, which would result in increased short-term construction impacts on floodplain transitional and floodplain obligate vegetation at the localized scale as compared to existing conditions and therefore, the No Action Alternative. No net loss mitigation ratios for trees and pervious surface as well as vegetation of replacement flood storage sites and RBZ beneficial gain plantings, as applicable, would help maintain important ecological functions for floodplain obligate species over the long term. However, certain aspects of the implementation of the no net loss standards could negatively impact special-status species. As discussed for Alternative 2 in Section 4.7.6 and Section 4.10.6, replacement flood storage at ratios greater than one to one may capture floodwaters that may have otherwise flowed into nearby areas, leading to a reduction in aquatic habitat quality and connectivity in certain areas. This could result in **localized minor short- and long-term adverse impacts** on floodplain obligate and floodplain transitional special-status species in the SFHA. Additionally, approximately 16 percent of SFHA development is expected to have project-specific ESA compliance and would not implement the no net loss standards. Although development with project-specific ESA compliance would not jeopardize ESA-listed species, developments in the SFHA that do not implement the no net loss standards could lead to **localized minor long-term adverse impacts** on floodplain obligate and floodplain transitional special-status species from continued loss of flood storage capacity, pervious surface, and trees. However, these adverse impacts **would not be significant** because floodplain functions in the SFHA would be maintained for the subset of applicable developments with implementation of no net loss standards.

However, in the long-term, implementation of the no net loss standards would be expected to offset the loss of floodplain functions, as described in Section 4.8.6. Additionally, under Alternative 2, development that is located outside the SFHA would reduce impacts in the SFHA, particularly on floodplain obligate special-status species. Therefore, compared to the No Action Alternative, there would be **moderate to major long-term beneficial effects** for floodplain obligate special-status species within the SFHA under Alternative 2 from maintained floodplain functions and changing development patterns.

Development that may be influenced to shift to non-SFHA areas would adversely impact floodplain transitional and non-floodplain special-status species consistent with impacts discussed for vegetation, terrestrial wildlife, and aquatic wildlife described in Section 4.8.6, 4.9.6, and 4.10.6. Per Oregon state land use laws and regulations, development outside the SFHA would likely occur primarily within UGBs where habitats are already affected by human activity. However, if more developers choose to locate their projects outside of the SFHA into the UGB, then the UGB might be expanded into nearby undeveloped areas sooner than planned, accelerating potential long-term effects. This change in development patterns could result in **localized minor long-term adverse impacts** on special-status floodplain transitional and non-floodplain species outside the SFHA, though most of this development would be expected to occur in UGBs and in areas already affected by human activity and therefore these impacts would **not be significant**.

4.11.7. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. Implementation of no net loss standards under Alternative 3 would apply to approximately 16 percent more projects within the SFHA than under Alternative 2 because projects with a federal nexus would also need to implement the no net loss standards (Section 4.1.1.3). Under Alternative 3, there would be more construction impacts related to implementation of the no net loss standards as compared to Alternative 2. Because the no net loss standards would be applied to more developments in the SFHA than under Alternative 2, ground disturbance related to implementation of the no net loss standards would increase. As with Alternative 2, replacement flood storage at ratios greater than 1 to 1 may capture floodwaters that may have otherwise flowed into nearby areas, leading to a reduction in aquatic habitat quality and connectivity in certain areas. This would increase habitat disturbance for floodplain obligate and floodplain transitional special-status species and could result in **localized minor to moderate short- and long-term adverse impacts** on floodplain obligate and **localized minor long-term adverse impacts** on floodplain transitional special-status species in the SFHA. However, in the long-term, at a regional or plan area scale, implementation of the no net loss standards would be expected to offset the potential loss of the three floodplain functions, which support habitat for these two categories of species. These adverse impacts **would not be significant** because floodplain functions in the SFHA would be maintained for developments with implementation of no net loss standards.

Alternative 3 may result in more development occurring outside the SFHA to avoid the cost and complexity of the no net loss standards compared to Alternative 2. This could further reduce impacts on floodplain obligate and floodplain transitional special-status species compared to Alternative 2. However, the number of additional developments that may elect to be located outside the SFHA under Alternative 3 would be expected to be small, resulting in only a slight increase in the number of developments that shift out of the SFHA compared to Alternative 2. Many developments that would be exempt from no net loss standards under Alternative 2 are expected to be projects that are linked to existing developments or are water dependent, such as infrastructure projects. These types of projects would remain within the SFHA under Alternative 3. Like Alternative 2, development projects that may be influenced to occur outside the SFHA could have **localized minor long-term adverse impacts** on non-floodplain special-status species and designated critical habitats. Non-floodplain special-status species could also be affected by habitat loss through conversion, but the majority of development would be expected to occur in UGBs and areas already affected by human activity and therefore these impacts would **not be significant**. When compared to the No Action Alternative, Alternative 3 would have a **major long-term beneficial effect** for floodplain obligate special-status species within the SFHA from maintained floodplain functions and changing development patterns.

4.12. Cultural and Historic Resources

The National Historic Preservation Act (NHPA) established a national policy for protecting historic resources and created a process for historic preservation (54 USC 300101). Section 106 of the NHPA requires federal agencies to consider the effect of their actions on cultural and historic resources, including historic properties and archaeological resources listed in or eligible for listing in the National Register of Historic Places (NRHP). To implement this requirement, the Advisory Council on Historic Preservation's regulations at 36 CFR Part 800 establish a review process. As defined in the Section 106 review process, federal agencies must determine whether the proposed action is an undertaking and whether the type of activity has the potential to cause effects on cultural and historic resources. An undertaking is a federal action that may have the potential to affect these resources.

A historic property is a building, site, or object that is significant to American history, culture, or architecture and is at least 50 years old. Historic resources can also be districts, landscapes, or collections of these. Historic properties can be listed in or eligible for listing in the NRHP and can include historic properties of traditional religious or cultural importance to a Tribal Nation. Resources can be significant at the national, state, or local level under the applicable law. An archaeological site is a location where physical evidence of past human activity can be found. These sites can include campsites, villages, cities, cemeteries, and more.

The terms Cultural Resource and Historic Resource are general terms that can be used interchangeably for both above- and below-ground resources. Historic structures generally refer to above-ground resources while archaeological sites refer to resources found below-ground.

The State of Oregon protects historic properties listed in the NRHP through the Oregon State Historic Preservation Officer (SHPO). Owners of property listed in the NRHP must comply with the Secretary of Interior's Standards for Rehabilitation when taking advantage of federal or state tax benefits and grant programs (NPS 2024; Oregon Heritage 2024). This standard provides guidance for making appropriate choices in repair, alteration, and additions to a historic property so that the long-term preservation of a property's historical significance is retained. State law requires local governments to review proposals that demolish or relocate properties listed in the NRHP (OAR 660-023-0200). Local governments also have the authority to form local historic districts and landmarks as well as create additional protections for properties listed in the NRHP, such as amending land-use regulations to protect NRHP resources.

The State of Oregon also protects archaeological resources through Indian Graves and Protected Objects regulations (ORS 97.740-97.760) and Archaeological Objects and Sites regulations (ORS 358.905-358.961). The Archaeological Objects and Sites regulations prohibit the excavation, injury, destruction, or alteration of archaeological sites and objects on public and private land in Oregon without first obtaining a permit issued by the State Parks and Recreation Department (ORS 358.920; ORS 390.235). Prior to issuing a permit, the State Parks and Recreation Department must consult with the landowner or land managing agency, as well as the Commission on Indian Services and the most appropriate Tribe if the site is associated with a prehistoric or historic native Indian culture. In

the event an archaeological site is inadvertently impacted by human caused activities, the Oregon State Historic Preservation Office (SHPO) must be contacted prior to any additional ground disturbance that may impact the site, in order to receive the required permits.

Under OAR 660-023-210, an amendment created a new rule within Goal 5 (OAR) that more accurately defines cultural areas and is scheduled to go into effect on January 1, 2026. The updated Cultural Areas Rule sets baseline notice requirements for all cities and counties and will require local governments to inform applicable Tribes when a development application is received. The adopted rules will also require cities and counties to notify Tribes when a development project is proposed that could impact an archaeological site or culturally significant landscape feature. Cities are also required to notify Tribes when considering UGB expansions and allow local governments to require preconstruction archaeological surveys in areas identified as having a high likelihood of being an archaeological site.

4.12.1. EXISTING CONDITIONS

4.12.1.1. Background Context

The two distinctive settlement patterns are observed in Oregon based first on Indigenous people before the eighteenth century and second on the development of urban areas and rural commercial endeavors by Euro-American immigrants that started in earnest by the nineteenth century. Understanding these patterns helps to provide a context for the rich archaeological resources to be found along Oregon's waterways and the existing cultural heritage of the built environment found in present-day Oregon. This historic and cultural context is the foundation by which cultural resources listed in the SHPO Historic Sites Database and in the NRHP are considered significant.

Modern-day evidence has placed the First People in North America more than 16,000 to 14,000 before present. In present-day Oregon, dozens of bands of people had settled land along the Columbia River by the sixteenth century (Robbins 2024). People living in the Northern Basin, Columbia Plateau, and the valleys between the Coast Range and Cascade ecoregions practiced a seasonal subsistence way of life, moving by waterways and overland trails to specific locations throughout the year to harvest, process, and preserve specific plants and animals (ODFW 2016). Despite the diversity of environments, salmon are a First Food resource and are central to Indigenous culture, community, and identity throughout the entire Oregon plan area (Northwest Power and Conservation Council. N.d.). The sustainability of this lifestyle was based on being able to access these diverse resources many of which are linked to floodplain habitats and the use of the waterways, streams, rivers, estuaries, and wetlands as transportation corridors was an important governor of this way of life. People on the coast of Oregon tended to travel less, creating more permanent year-round settlements along the coastal waterways as they relied on the abundance of food from the ocean and estuaries to provide dominant food sources. People throughout other ecoregions traveled extensively through the spring, summer, and fall seasons. In winter, all Indigenous people lived in permanent villages, which typically consisted of related family units and were predominately located at a water source. This pattern of movement, and the use of both

seasonal and temporary settlements, created a large, networked area of historical significance along the water systems of Oregon.

The diversity of Oregon's cultural history is also woven into the economic efforts of the different populations. Indigenous populations that lived along the Oregon Coast not only regularly traded with nearby villages, but they also had occasions where they could trade with voyagers in seagoing canoes from northern Canadian areas, thus introducing different trade items into the regional economy. In the later decades of the eighteenth century, the Northwest Coastal area became a place with an emerging global economy as Europeans started to arrive more frequently by sea. In the coastal areas and elsewhere, Indigenous people, fur trappers, and explorers interacted and carried on exchanges of goods and services in a barter and trade-based economy.

At the turn of the eighteenth century, settlement patterns consisted of the subsistence lifestyle of the Indigenous populations, a few Euro-American rudimentary farmsteads that had been established, and scattered outposts of British and French-Canadian explorers and trappers found along the waterways. The population change was driven by the increased exploration of Oregon that was being conducted by European countries looking for wealth and expansion opportunities in the Northwest. This interest helped to start the influx of immigrants as opportunities in Oregon were broadcast in developed cities by entrepreneurs looking for labor. By the late 1840s, the discovery of gold in the territories to the east of Oregon increased the migration flow with a second migration influx happening in the 1850s when gold was discovered in eastern Oregon. Driven by economic interests, the development of the railroads in the later decades of the nineteenth century, became a powerful method of centralizing populations in urban areas while at the same time, scattering people into smaller communities when new rural areas across Oregon became accessible (Robbins 2024). The introduction of the railroads boosted the emerging agricultural production while the natural harbors and waterways found along the coast and major rivers provided a direct avenue to move timber harvests to markets. Large corporations and conglomerates were founded during this first rush to tap into the natural wealth of the Oregon forests as sawmills along natural waterways started to populate the shorelines causing permanent towns to spring up around them.

The second productive business of the region that spurred settlement was the salmon harvests along the state's rivers, creating increased development along the waterways. Starting in the last two decades of the nineteenth century and into the years before the First World War, highly efficient harvesting techniques and a proliferation of canneries caused the salmon industry to reach record highs. However, a steady decline in salmon production started in the late 1930s caused by overfishing and habitat destruction from timber harvest, mining, and dams.

The history of Oregon is expressed in the archaeological finds that provide evidence of past human occupation and in the existing built environment that reflects the development of Euro-American interests and culture. These historic resources can be found along the many waterways and industrial corridors that retain the record of Oregon's growth from a lightly populated Pacific Northwest landscape to the present-day range of agricultural and resource-based communities and bustling metropolises. Given that the historical context of human use and settlement is linked closely

to the waterways and shorelines of the state, it follows that many historic resources would be found within the SFHA.

4.12.1.2. Archaeological Resources

Archaeology is the study of human history and prehistory through the identification, recovery, and analysis of sites, artifacts, and material culture left behind from past human life and activities. These include human artifacts that range from the very earliest stone tools to human-made or modified objects that were abandoned, buried, or discarded. Archaeological resources are the physical evidence of past human activities and cultures. The Archaeological Resources Protection Act and its regulations define archaeological resources as "any material remains of human life or activities which are at least 100 years of age, and which are of archaeological interest."

As stated in Oregon's Archaeology Bulletin 1, under Oregon State Law (ORS 358.905-358.961, ORS 390.235, OAR 736-051-0090) significant archaeological sites are protected on all non-federal public (state, county, city) and private lands. Significance is based on the potential of an archaeological site to be eligible for inclusion in the NRHP, which means the site possesses important archaeological information on a local, regional, or national level. Archaeological sites are considered significant until their eligibility can be evaluated. If an archaeological site is on private land, it should be avoided. If avoidance is not possible and the site would be impacted as a result of a proposed activity (e.g., construction [buildings, access routes, irrigation], dumping, trampling), it would need to be evaluated (recorded and studied by a professional archaeologist) for significance under a state-issued permit before the activity can begin (Oregon Heritage 2019).

Every county in the Oregon plan area has archaeological surveys that are recorded in the archaeology inventory database that identify the presence of archaeological resources, with more than 14,000 surveys recorded. However, a majority of the state has not been surveyed for archaeological or cultural resources so the absence of an archaeological site in the Oregon SHPO database is far from conclusive evidence of the of the absence of an archaeological site.

4.12.1.3. Architectural Resources

Architectural resources, also known as the built environment, includes everything that humans build that is distinguished from the natural environment. The historic built environment can be defined as those man-made aspects of our heritage and environment along with the remains of human activity that contribute to the special nature and quality of a place. The historic built environment is generally considered to include buildings, transportation structures, engineered structures, objects, landscapes, fencing and stone walls, or any other artifacts of historical significance.

According to the Oregon Historic Sites Database (SHPO inventory record), all counties within the Oregon plan area have architectural resources listed in the NRHP. Each of these counties has individually eligible resources in the NRHP and 22 of the 31 counties have multiple designated historic districts listed as well. Multnomah, Jackson, Lane, and Marion counties have the highest concentration of architectural resources listed by the SHPO.

4.12.2. EXISTING CONDITION — DEVELOPMENT

The alternatives considered in this Draft EIS, including any guidance developed in support of alternative implementation, do not constitute an undertaking that could result in effects. Communities ensuring compliance with and enforcing the alternatives, and developers implementing the alternatives do not constitute a federal action. Therefore, FEMA has no further Section 106 responsibility because FEMA's implementation of the alternatives would not be an undertaking that could result in effects, and communities implementing the alternatives would not be a federal action. Although the alternatives themselves are not subject to the NHPA (i.e., FEMA's role is not an undertaking with effects, and the developer's role is not a federal action), an individual development under any of the alternatives could be reviewed under the NHPA if there is a federal nexus.

Development with a federal nexus that has the potential to affect cultural and historic resources would be subject to the NHPA regardless of the alternative. Consultation would be required as outlined in the Section 106 review process and if the federal agency determines there is a potential adverse effect, the federal agency would consult with SHPO, the Tribes, or both to identify necessary measures to avoid impacts on cultural and historic resources.

Development without a federal nexus could alter all or part of a historic property if the Secretary of Interior's Standards for Rehabilitation are not enforced under a local state tax benefit or grant program (Oregon Heritage 2024), and if no other local protections are applicable (OAR 660-023-0200).

Construction activity associated with development poses the unintended risk of exposing, altering, damaging, or destroying archaeological objects and sites. Implementation of the OAR 660-023-210 would minimize the impacts on archaeological resources. However, the Archaeological Objects and Sites regulations (ORS 358.905-358.961) prohibit the excavation, injury, destruction, or alteration of archaeological sites and objects on public and private land. Thus, if archaeological resources are identified during construction activities, a permit would be acquired by the State Parks and Recreation Department to ensure no damage or destruction of resources occurred. Construction activity occurring in sites of know cultural sensitivity would be subject to OAR 660-023-210.

Excavation of Native American cairns or burial sites requires written notification to the SHPO and the state police (ORS 97.750). Issuance of the permit would ensure that the landowner or land managing agency was consulted with, as well as the Legislative Commission on Indian Services and the most appropriate Tribe if the site is associated with a prehistoric or historic native Indian culture. However, development may inadvertently alter, damage, or destroy archaeological objects and sites from the use of equipment on an unknown site of archaeological sensitivity.

4.12.3. SIGNIFICANCE CRITERIA

An evaluation of potential impacts would involve a comparison of the current and future integrity of historic buildings and structures, or archaeological sites, and a determination of the extent to which the alternatives might affect the resource's integrity. There is the potential for significant impacts to occur when an activity:

- Causes loss of maintenance of a historic property resulting in its deterioration, destruction, or otherwise results in a loss of NRHP eligibility
- Increases the potential for damage or destruction of archeological resources beyond what is reasonably expected under existing conditions

4.12.4. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. FEMA's role under the No Action Alternative would not involve any soil or structure disturbing activities that would constitute a federal undertaking that could affect historic resources. Communities ensuring compliance with and developers implementing the NFIP under the No Action Alternative would not constitute a federal action. Therefore, FEMA would have no further Section 106 compliance obligation; however, proposed developments may be subject to the NHPA if there is a federal nexus.

Because implementation of the NFIP would remain unchanged, there would be no change in impacts on cultural and historic resources compared to existing conditions (Section 4.12.2). Because the No Action Alternative would not change impacts on cultural and historic resources compared to existing conditions, the NEPA finding is **no impact** compared to existing conditions.

4.12.5. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. FEMA's role under Alternative 2 would not involve any soil or structure disturbing activities that would constitute a federal undertaking that could affect cultural and historic resources. Communities ensuring compliance with the no net loss standards and developers implementing the standards would not constitute a federal action. Therefore, FEMA would have no further Section 106 compliance obligation; however, proposed developments may be subject to the NHPA if there is a federal nexus.

Alternative 2 would not change the potential for alteration of a historic property compared to the existing conditions discussed in Section 4.12.2. Alternative 2 would not be expected to cause a loss of maintenance of a historic property. Maintenance work would be reasonably expected to occur within the existing footprint of the structure and as such the no net loss standards would not apply.

However, the potential to encounter unknown archaeological resources in the SFHA would increase compared to the No Action Alternative and existing conditions as a result of the additional ground disturbance needed to achieve no net loss of floodplain functions. In the Model Project A – Residential New Build scenario, an additional 6,800 cubic feet (252 cubic yards) of soil would be removed from the SFHA to achieve no net loss of flood storage beyond the ground disturbance expected from the development itself. As described in Section 4.12.2, ground disturbance could result in the exposure of, damage to, or destruction of archaeological resources. Thus, the potential for exposure would increase under Alternative 2. However, implementation of OARs would minimize

the potential damage and destruction of archaeological resources consistent with existing conditions.

In the long term, the cost of implementing the no net loss standards could influence some development to move to areas outside of the SFHA (Section 4.2), which could reduce the number of projects and their associated construction activity potentially impacting archaeological objects and sites in the SFHA. Although the risk of encountering archaeological resources would remain for development outside of the SFHA, the non-SFHA areas may have a slightly lower potential for such resources based on the patterns of human use and settlement near waterways.

At the Oregon plan area scale, Alternative 2 would have a **negligible adverse impact** on historic structures from development that alters all or part of a historic property if the NHPA or the Secretary of Interior's Standards for Rehabilitation do not apply to that property. The financial capacity to maintain historic structures as well as federal and state assistance funding would remain unchanged. Impacts would **not be significant** because Alternative 2 would not result in the loss of maintenance of a historic structure or otherwise result in a loss of NRHP eligibility. Implementation of the no net loss standards would increase the risk of encountering archaeological objects and sites in the SFHA and result in a **moderate adverse impact** on archaeological resources. Impacts would **not be significant** because although the potential exposure of archaeological resources would increase, the potential for damage or destruction would not increase compared to existing conditions and therefore the No Action Alternative. Alternative 2 would have a **negligible beneficial effect** compared to the No Action Alternative from the potential shift of development outside of the SFHA, which could reduce the likelihood of encountering, disturbing, or damaging unknown archaeological resources.

4.12.6. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. FEMA's role under Alternative 3 would not involve any soil or structure-disturbing activities that could affect cultural and historic resources and thus, would not constitute a federal undertaking. Additionally, under this alternative, communities would ensure compliance with the no net loss standards and developers would implement the standards, and there would not be a federal action. Therefore, FEMA would have no further Section 106 compliance obligation; however, developments may be subject to the NHPA if there is a federal nexus.

As with Alternative 2, Alternative 3 would not have the potential for alteration of a historic property as compared to the existing conditions. Similar to Alternative 2, implementation of the no net loss standards would not be expected to cause a loss of maintenance of a historic structure. Compared to Alternative 2, Alternative 3 would result in additional ground disturbance because development with a federal nexus would also need to implement the no net loss standards. Thus, Alternative 3 could increase the potential to expose or damage archaeological resources compared to Alternative 2.

Developments with project-specific ESA compliance are generally expected to be larger infrastructure projects. For example, Model Project B - Port Improvements would require 612,526 cubic feet (22,686 cubic yards) of soil to be removed from the SFHA to achieve no net loss of flood storage. However, development with a federal nexus (and associated project-specific ESA compliance) would also be more likely to be subject to the NHPA and implement associated measures to protect archaeological resources. Implementation of the ORS would minimize the impacts on archaeological resources once they are identified.

As with Alternative 2, some development could be influenced to occur outside of the SFHA to avoid the cost and complexity of implementing the no net loss standards. Although the risk of encountering archaeological resources would remain for development outside of the SFHA, the non-SFHA areas may have a slightly lower potential for such resources based on the patterns of human use and settlement. Therefore, at the Oregon plan area scale, impacts would be the same as described under Alternative 2, Section 4.12.5.

4.13. Tribal Treaty Rights

Tribes have inhabited the Pacific Northwest since time immemorial, as detailed in Section 4.12. The United States entered into multiple agreements and treaties with local Tribes in Oregon. Some of those treaties were ratified and others were not. In 1954, many of the treaties entered into with Tribes west of the Cascade Mountains were terminated in the Western Oregon Termination Act, 68 Stat. 724. Termination was disastrous for the Tribes and all of Indian Country, and the policy was largely reversed over the coming decades. Several Tribes terminated were restored in the 1970s and 1980s, including the Confederated Tribes of Siletz Indians (1977), the Cow Creek Band of Umpqua Tribe of Indians (1982), the Confederated Tribes of the Grand Ronde (1983), the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians (1984) the Klamath Tribes (1986) and finally the Coquille Indian Tribe (1989). Many other Tribes and bands were not restored. Each Tribe in Oregon has its own history, culture, language, and rights under a variety of treaties, both state and federal statutes and regulations, as well as court cases adjudicating Tribal rights. Today there are nine federally recognized Tribes headquartered within the boundaries of Oregon, and more with ancestral rights, interests, or lands.

The alternatives being analyzed in this Draft EIS are intertwined with local development, salmonid habitat, and Tribal resources. While this Draft EIS must demonstrate compliance with the NEPA regulations that were in effect at the time of the March 6, 2023, NOI (Section 4.1.2), FEMA is providing the following excerpt of the 2024 amended NEPA regulations because they offer a clear analytical framework for a Tribal rights and interests analysis.

NEPA (42 USC 4332) requires an analysis of all “reasonably foreseeable environmental effects of the proposed agency action” which would include an analysis of the effects on the rights of degree to which the action may adversely affect the rights of Tribal Nations that have been preserved through treaties, statutes, or Executive Orders” (CEQ guidance formerly at 40 CFR 1501.3(d)(2)(viii)). NEPA also requires that agencies in carrying out their mission seek to preserve important historic, cultural,

and natural aspects of our national heritage, which necessarily includes consideration of the effects on historic/cultural resources of sovereign Tribal Nations (42 USC 4331).

In 2021, the Department of Homeland Security (DHS) and 12 other federal departments signed a "Memorandum of Understanding Regarding Interagency Coordination and Collaboration for the Protection of Tribal Treaty Rights and Reserved Rights." They acknowledged that:

> Treaty-protected rights to use of and access to natural and cultural resources are an intrinsic part of Tribal life and are of deep cultural, economic, and subsistence importance to Tribes. Many treaties protect not only the right to access natural resources, such as fisheries but also protect the resource itself from significant impairment.
>
> …Pursuant to this principle, and its trust relationship with federally recognized Tribes, the United States has an obligation to honor the rights reserved through treaties, including rights to both on and, where applicable, off-reservation resources, and to ensure that its actions are consistent with those rights and their attendant protections.

This section compliments Tribal considerations that are evaluated in other sections of this chapter. See for example, NHPA (see Section 4.12), impacts to vegetation and wildlife (Sections 4.8 to 4.11), and economic resources (Section 4.3). Chapter 5 summarizes FEMA's outreach and consultation with Tribes during the development of this Draft EIS. Given that Tribes may join the NFIP in the future and that the SFHA may change, this section is not restricted to the Tribal rights and interests of only Tribes currently participating in the NFIP and those with off-reservation treaty rights.

4.13.1. EXISTING CONDITIONS

Fish, wildlife, and plants play a central role in the spiritual and cultural framework of Tribal life. As such, treaties signed between Tribes and the federal government explicitly guarantee hunting, gathering, and fishing rights on land and in waters within and outside of the jurisdiction of reservations.

Tribes can only exercise their explicit hunting, gathering, and fishing rights if the habitat sustains the fish, animals, and plants. Development in the floodplain changes the biological and physical characteristics of the floodplain, which constitutes an ethno-habitat or eco-cultural system. A healthy ethno-habitat or eco-cultural system is one that supports its natural plant and animal communities and also sustains the biophysical and spiritual health of its native peoples. Ethno-habitats are places clearly defined and well understood by groups of people within the context of their culture. These are living systems that serve to help sustain modern Tribal ways of life, cultural integrity, social cohesion, and socio-economic well-being. The lands that embody these systems, encompass traditional homelands, places, ecological habitats, resources, ancestral remains, cultural landmarks, and cultural heritage. Larger ethno-habitats can include multiple interconnected watersheds, discrete geographies, seasonal use areas, and access corridors (Harris and Harper 1997, Harris and Harper 2000).

Salmon is a core part of the oral traditions of the Tribes of the Columbia Plateau and remains an important resource in native peoples' diet just as it has since time immemorial for thousands of generations. Salmon is among those foods regularly recognized ceremonially. One example is the *ke'uyit* which translates to "first bite." It is a ceremonial feast that is held in spring to recognize the foods that return to take care of the people. It is a long-standing tradition, and it is immersed in prayer, songs, and dancing. Salmon is the First Food that is eaten by the attendants. Extending gratitude to the foods for sustaining the life of the people is among the tenets of the plateau lifestyle. Life is perceived as intertwined with the life of the salmon.

4.13.2. SIGNIFICANCE CRITERIA

A significant adverse impact may occur if a proposed activity:

- Violates a right preserved in a Treaty.
- Adversely affects habitat within and outside of the Tribal reservations such that the biophysical and spiritual health of the Tribe is further exacerbated.

A significant beneficial effect may occur if a proposed activity addresses or reduces a significant adverse effect on Tribal treaty rights as identified in this or other sections of this chapter.

4.13.3. IMPACTS COMMON TO ALL ALTERNATIVES

Under all alternatives, development within the SFHA in NFIP participating communities is reasonably expected to continue. However, as discussed in Section 4.2, none of the alternatives would likely change the rate of development at the Oregon plan area scale because this rate is based on population and economic growth and not the NFIP. It is difficult to predict the magnitude of effects that could result from any of the alternatives since the exact location and amount of future development within the SFHA are unknown.

4.13.4. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. As discussed in Section 3.2, implementation of the NFIP in the Oregon plan area under the No Action Alternative would not include additional steps NMFS determined in its 2016 BiOp as necessary to address the likely jeopardy of ESA-listed species and Southern Resident killer whale; destruction or adverse modification of designated critical habitat, and adverse effects on EFH. Therefore, the No Action Alternative may have a **major and significant adverse impact** based on NMFS' 2016 BiOp determination that the continued existence of ESA-listed species or their critical habitat would remain jeopardized, including fish species protected under Tribal treaty rights, and adverse effects on EFH would occur.

4.13.5. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means.

As described for fish and aquatic wildlife in Section 4.10.6 and threatened and endangered species in Section 4.11.6, FEMA concludes that the expected regional beneficial effects of the no net loss standards that would maintain existing floodplain functions for aquatic species would outweigh the potential localized adverse impacts that could occur from mitigation actions.

SFHA development that complies with the no net loss standards under Alternative 2 would have a **minor short-term adverse effect** on aquatic habitat and a **negligible long-term beneficial effect** compared to the No Action Alternative.

Under this Alternative, development that has project-specific ESA compliance would not be required to implement the no net loss for standards and may result in the impairment of habitat described under existing conditions for fish and aquatic wildlife (Section 4.10.2). As discussed in Section 4.1.1.3, development with project-specific ESA compliance is expected to represent approximately 16 percent of development in the SFHA. As such, Alternative 2 would still constitute an improvement compared to the No Action Alternative because 84 percent of development in the SFHA would implement the no net loss standards. Therefore, the net adverse effect of this alternative on habitat and therefore on Tribal rights and interests would be minor and adverse. In addition, Alternative 2 would have a **negligible long-term beneficial effect** from maintaining flood storage, water quality, and vegetation compared to the No Action Alternative. Impacts would **not be significant** because the long-term beneficial effects would outweigh the short-term adverse impacts, thereby maintaining existing aquatic habitat for salmonids, which supports Tribal Treaty Rights and the subsistence, cultural, and ceremonial practices of Tribes.

4.13.6. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. Therefore, this alternative would result in a more favorable outcome for aquatic habitat when compared to Alternative 2. However, as described in Section 4.1.1.3, development with project-specific ESA compliance is expected to represent a small (16 percent) portion of SFHA development.

As such, although the impacts and benefits under Alternative 3 would occur from a larger number of developments than Alternative 2, the overall impact would be as described under Alternative 2.

4.14. Hazardous Materials

Hazardous materials can pose a threat to people or the environment and may include herbicides, pesticides, petroleum products, solvents, or other metals and chemicals. Hazardous materials may be present in soil, groundwater, surface water, and sediments from historical or current land uses.

Hazardous materials are regulated at the federal and state levels by EPA, ODEQ, and through the OSSC. The Resource Conservation and Recovery Act (RCRA) gives EPA, or the state's hazardous waste regulatory agency, the authority to control hazardous waste including generation, transportation, storage, and disposal (40 CFR Part 239 to 282). The Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR Part 307) gave EPA the authority to seek out

parties responsible for hazardous waste accidents and spills, cleanup sites where responsible parties cannot be identified, located, or fail to act (commonly referred to as Superfund sites).

In Oregon, ODEQ administers the RCRA. ODEQ's Land Quality Programs are responsible for waste reduction and management, spill preparedness and response, environmental assessment and cleanup, and underground storage tank compliance and cleanup. The OSSC includes building specifications and requirements for facilities that manufacture, process, dispense, use, or store hazardous materials.

In addition, the Occupational Safety and Health Administration regulates construction activity as it relates to hazardous materials and EPA provides guidance for construction worker safety when handling hazardous materials. EPA guidance recommends safety zones for work sites to reduce the accidental spread of hazardous substances by workers or equipment.

4.14.1. EXISTING CONDITIONS

EPA's EnviroFacts database tracks RCRA sites. In Oregon, 4,432 active RCRA sites are recorded (EPA 2024c). EnviroFacts does not provide data suitable to determine the exact location of all RCRA sites. However, is it reasonable to assume a portion of the sites occur within the Oregon plan area and within the SFHA. RCRA sites include those that generate, transport, store, and dispose of hazardous materials. RCRA sites can include landfills (e.g., Finley Buttes Landfill, Boardman), factories (e.g., U.S. Pipe Fabrication LLC, St. Helens), hospitals (e.g., Bay Area Community Hospital, Coos Bay), wastewater treatment plants (e.g., City of Newberg Water Treatment Plant), rail yards, and ports.

EPA maps Superfund National Priority Sites, allowing analysis specifically within the Oregon plan area. Based on data from the EPA, 12 Superfund National Priority Sites are located within the Oregon plan area, several of which are located within or near the SFHA (EPA 2024d). For example, the Portland Harbor Superfund site located along the lower Willamette River within the SFHA was contaminated from decades of industrial land use.

In addition to the known sites discussed, there may be unknown (unrecorded) hazardous material or contaminated sites. For example, underground storage tanks can leak, releasing contaminants into soil and groundwater that can go undetected for many years. In addition, hazardous materials may be transported via rail, highway, or water throughout the Oregon plan area with many transportation corridors found in the SFHA. Although the transport of hazardous materials is regulated, historical spills, accidents, and accumulated contaminated debris along transportation corridors may be a source of pollution that is not reflected in RCRA or EPA databases.

4.14.2. EXISTING CONDITIONS — DEVELOPMENT

Under existing conditions, development would have short-term impacts related to hazardous materials from equipment use and the potential to encounter hazardous materials during excavation and grading activities. Development would adhere to federal and state regulation of hazardous materials and use best management practices to avoid the accidental release of equipment-related

contaminants. The generation, transportation, storage, and disposal of hazardous materials would remain regulated by the RCRA. Facilities that manufacture, process, dispense, use, or store hazardous materials would comply with OSSC building specifications and requirements. Adherence to regulations governing hazardous materials would avoid and minimize the potential threat to people or the environment from exposure to hazardous substances. However, the threat of exposure to hazardous substances cannot be eliminated.

4.14.3. SIGNIFICANCE CRITERIA

An evaluation of impacts related to hazardous materials involves a comparison of the generation, transportation, and storage of hazardous materials between alternatives. There would be the potential for significant adverse impacts related to hazardous materials if an alternative:

- Constitutes a change in the quantity or type of hazardous wastes or materials that could be released to the environment compared to existing conditions.
- Creates a hazard to the public or the environment through the routine transport, use, or disposal of hazardous wastes and materials in a manner that exceeds regulatory standards.
- Creates conditions that could result in reasonably foreseeable hazards to the public or the environment through the release of hazardous wastes or materials into the environment that exceed the potential for release of such materials under existing conditions.

4.14.4. IMPACTS COMMON TO ALL ALTERNATIVES

None of the alternatives would alter the amount or anticipated rate of development across the plan area, which is driven by population change and economic growth factors (Section 4.1.1.1). Continued development in the SFHA is anticipated in NFIP-participating communities under all alternatives, as described in Section 4.2. All alternatives would be subject to existing regulations, which could help to minimize impacts related to hazardous materials as described under existing conditions (Section 4.14.2).

4.14.5. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. Because implementation of the NFIP would remain unchanged, there would be no change in impacts related to hazardous materials from equipment use; ground disturbance; or facilities that manufacture, process, dispense, use, or store hazardous materials compared to existing conditions (Section 4.14.2). Because the No Action Alternative would not change impacts related to hazardous materials compared to existing conditions, the NEPA finding is no impact compared to existing conditions.

4.14.6. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. Impacts for an

individual development would be consistent with those described under existing conditions described in Section 4.14.2.

The cost of implementing the no net loss standards could influence some developers to move outside of the SFHA (Section 4.2), which would reduce the risk of flood damage resulting in an accidental release of hazardous materials. Although development patterns may shift, implementation of the no net loss standards would not alter the type or rate of development, and associated generation, transport, storage, or disposal of hazardous materials. Maintenance of existing structures within the existing footprint of the structure would not be subject to no net loss (Section 3.3.3). As such, the cost of implementing no net loss would not impact the ability of hazardous material facility owners to repair their existing structures and keep them in working condition to avoid potential health hazards.

Implementation of flood storage mitigation at ratios above 1 to 1 would alter the way floodwater flows across the landscape (Section 4.6.6 and Section 4.7.6). If flood velocities and depths increase in a particular location, the extent of flood damage to hazardous materials facilities in the SFHA and the associated risk of accidental release or spills could increase. Similarly, if the altered hydrologic patterns of floodwaters result in lower flood velocities and shallower depths or even no flooding, then the potential for flood damage would be reduced. Compliance with the OSSC would likely confirm that structures could withstand flood velocities, such as through flood-resistant building materials or structure elevation. In addition, the NFIP minimum floodplain management standards, which includes using building materials resistant to flood damage, would continue to be implemented. No net loss of pervious surface and trees would be implemented for most projects in the SFHA because an estimated 84 percent of SFHA development would implement the no net loss standards (Section 4.1.1). Preserving pervious surface area would maintain the existing condition of water infiltrating into the ground where soils and plants can filter contaminants. No net loss of trees would require planting trees at ratios ranging from 2 to 1 up to 12 to 1. While these ratios account for tree survival rates and address the temporary loss of function as trees mature, there could be an increase in the number of trees in the long term as trees survive to maturity. Trees remove, decompose, and stabilize contaminants from soils and groundwater (EPA 2012). While trees take time to mature, this could increase contaminant decomposition by trees in the SFHA in the long term.

Section 4.2.1 presented the number of residential and commercial permits for development in the SFHA between 2019 and 2023 for three counties within the Oregon plan area. As noted in Section 4.3.1, the rate of future residential and commercial development in the SFHA is expected to remain the same as projected based on expected population and economic growth. The projected rate is similar to or slightly less than observed from 2010 to 2020. Therefore, it is reasonable to expect the number of permits issued would remain approximately the same moving forward. **Table 4.17** depicts the anticipated planting of trees for implementation of no net loss of vegetation in three representative counties over 5 years, assuming all trees survive to maturity. **Table 4.17** uses Model Project A - Residential New Build to represent residential permits and Model Project C - Existing Parking Lot to Large Building to represent commercial permits. The actual number of trees and tree sizes affected by projects would vary widely and the model projects are unlikely to represent an average. This calculation also assumes that no project proponents would decide to move to locations

outside of the SFHA due to the costs associated with implementation of the no net loss standards, and that all trees survive to maturity.

Table 4.17. Anticipated Planting of Trees for Implementation of No Net Loss of Vegetation in Select Counties over Five Years

County	Number of Residential Permits from 2019 to 2023	Net Increase in Trees[1]	Number of Commercial Permits from 2019 to 2023	Net Increase in Trees[2]	Total Increase in Trees
Umatilla County	0	0	1	13	13
Benton County	35	1,050	8	104	1,154
Tillamook County	26	780	5	65	845

Source: ACCELA 2024, CDM Smith GIS analysis
Notes:
1. Assumes 30 replacement trees planted per permit based on Model Project A - Residential New Build, occurring in the RBZ.
2. Assumes 13 trees planted per project based on Model Project C - Existing Parking Lot to Large Building.

EPA estimated the reduction of contaminants associated with trees at the Aberdeen Proving Ground in Maryland where chemicals and industrial degreasers were found in groundwater. The site was planted with 183 trees in a 1-acre area. EPA estimated that over the course of 30 years, groundwater contaminants may be reduced by up to 85 percent (EPA 2012). However, to realize contaminant reduction from trees, the replacement trees would need to be planted close together (e.g., density of 183 trees per acre) in contaminated soils for a measurable improvement, which may or may not occur. Over the Oregon plan area, potential improvements would likely be slight and localized because not all trees would be planted in the same place, trees may not be planted in contaminated soils, and trees could take decades to result in measurable improvements.

At the Oregon plan area scale, there would be a **negligible long-term adverse impact** on hazardous materials because the potential for changes in floodplain dynamics from the implementation of no net loss of flood storage would be unlikely to result in increased flood damage to facilities. Alternative 2 could have a **negligible long-term beneficial effect** compared to the No Action Alternative where no net loss mitigation ratios would not be implemented because the amount of pervious surface in the SFHA would generally be maintained, and the increased number of trees could slightly and locally reduce contaminants in soil as trees mature. Impacts would **not be significant** because there would be no substantial change in the quantity or type of hazardous materials; no significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials; and no significant hazard to the public or environment through reasonably foreseeable release of hazardous materials as compared to the existing condition and the No Action Alternative.

4.14.7. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. As discussed in

Section 4.1, FEMA assumes that approximately 16 percent of floodplain development permits would be expected to obtain project-specific ESA compliance documentation, which generally represents larger infrastructure projects that may have in-water work or a federal nexus.

As with Alternative 2, Alternative 3 would not alter federal and state regulation of hazardous materials, the OSSC, nor remediation processes. As such, potential impacts from an individual development would be the same as described under existing conditions.

With a larger percentage of development subject to the cost and complexity of the no net loss standards, there may be somewhat more development occurring outside of the SFHA than under Alternative 2 (Section 4.1.1.1), except for water dependent development (e.g. port). Property owners' ability to maintain existing hazardous materials facilities within the existing footprint would be unchanged in Alternatives 2 and 3; these actions would not trigger implementation of the no net loss standards.

Larger infrastructure projects that obtain project-specific ESA compliance through other means would also implement no net loss standards and therefore, would increase the amount of replacement storage created throughout the SFHA. Model Project B - Port Improvements would be expected to obtain project-specific ESA compliance through a Section 404 CWA permit and would require approximately 612,523 cubic feet (22,686 cubic yards) of replacement storage. As with Alternative 2, the alteration of floodplain dynamics would be unlikely to result in increased flood damage to facilities or an increased exposure to hazardous materials, in part due to the application of the OSSC and continued implementation of the NFIP.

Similarly, Alternative 3 would increase the amount of mitigation implemented to maintain pervious surface and trees in the SFHA as compared to Alternative 2. This would better maintain the existing condition of water infiltrating the ground, where soils and plants can filter contaminants, compared to Alternative 2. Although more replacement trees would be planted under Alternative 3 (Model Project B - Port Improvements alone would require 40 trees to be planted), the potential improvements related to contaminated soils would be limited by factors including tree survival rate, planting density, and planting location relative to contaminated soils. As such, impacts at the Oregon plan area scale under Alternative 3 would be as described under Alternative 2.

4.15. Transportation

4.15.1. PLANNING AND GOVERNANCE

Transportation systems in Oregon are primarily governed by the Oregon Department of Transportation (ODOT). The Oregon Transportation Commission adopted the most recent Oregon Transportation Plan (OTP) under ORS 184.617 (c) on July 13, 2023. The OTP provides an overview of the current state of the Oregon transportation network, along with their mission and vision, future goals and objectives, and implementation and investment strategies. The OTP covers all forms of standard, commercial, and industrial transportation infrastructure for planes, trains, bicycles, pedestrians, and vehicles of all kinds. While the Oregon Transportation Commission has final

decision-making responsibilities for the OTP, the plan is developed with the input of local, regional, and state agencies, federally recognized Tribes, ODOT staff, community leaders and organizations, and other individuals and organizations.

Regional Metropolitan Planning Organizations (MPOs) are organizations of local governments in areas of over 50,000 people. In Oregon, federally designated MPOs are made up of large urban MPOs (population areas greater than 200,000), including the Portland regional area, the Salem/Keizer area, and the Eugene/Springfield area, and small urban MPOs (population areas between 50,000 and 200,000), including the Medford/Rogue Valley area, the Cities of Corvallis/Philomath, the City of Bend, Albany area, Middle Rogue, Longview/Kelso/Rainier, and Walla Walla Valley. Federal highway and transit statutes 23 CFR Part 450 and USC 23, 123, and 450 require an MPO to provide transportation planning, programming, and coordination of federal highway and transit investments in urbanized areas as a condition for spending federal highway or transit funds. Each MPO has a transportation plan. In addition, all counties in Oregon are required to adopt a transportation system plan to fulfill their obligations under Goal 12 of the Statewide Planning Goals and Guidelines. Some NFIP participating communities have transportation plans and Oregon transit agencies also frequently have plans. However, all regional and local governments and transportation providers' plans, as well as other state agency plans must be consistent with the OTP.

4.15.1.1. Funding

A large portion of transportation infrastructure funding (i.e., roads, bridges) is provided by the U.S. Department of Transportation's Federal Highway Administration (FHWA). FHWA funding may be provided to state and local governments, federally recognized Tribes and affiliated groups, transportation providers and operators, and others. Non-federal funds, including those generated and dispersed by the State of Oregon, local municipalities, and Tribes, may also be used to fund transportation infrastructure.

4.15.1.2. Road Design and Safety

FHWA has adopted safety standards for road geometrics, bridges and structures, hydraulics, materials, and accessible pedestrian design. These standards are listed in 23 CFR 625.4 and 49 CFR 37.9.

Oregon state guidance on state-owned highway safety design is provided in the ODOT Highway Design Manual. National Highway System or federal-aid projects on roads that are under the jurisdiction of cities or counties will typically use the 2018 American Association of State Highway and Transportation Officials design standards or ODOT resurfacing, restoration and rehabilitation design standards, both of which offer design guidelines for safety compliance. State and local planners will also use the manual in determining safety design requirements as they relate to the state highways in transportation system plans, corridor plans, and refinement plans.

ODOT worked with NMFS to authorize a Section 4(d) limit for activities associated with ODOT's Routine Road Maintenance Program. ODOT prepared the Routine Road Maintenance Water Quality and Habitat Guide to establish BMPs to ensure that activities under the Routine Road Maintenance

Program are within the NMFS Section 4(d) limit.[53] Activities that comply with the 4(d) limit authorizations avoid ESA Section 9 violations for species specified under the limit authorization. Examples of the safety BMPs established in the guide include minimizing discharges to receiving streams and wetlands, planting vegetation on eroding banks, and re-seeding drainage ditches and steep slopes as appropriate (ODOT 2020).

4.15.2. EXISTING CONDITIONS

Transportation networks include roads, rail, and air networks. Using Geographic Information System (GIS) data maintained by ODOT, total road miles were calculated for both the Oregon plan area and the SFHA (**Table 4.18**). There is a total of approximately 61,090 miles of existing roads in the Oregon plan area. [54] Of this, approximately 2,300 miles or 3.8 percent is in the SFHA (ODOT 2023a).

Table 4.18. Total Road Mileage in the Oregon Plan Area and the SFHA

Road Miles in the Oregon Plan Area	Road Miles in SFHA	Percentage of Total Miles in SFHA
61,093	2,305	3.8%

Source: ODOT 2023a, CDM Smith GIS analysis

Table 4.19 further analyzes road miles in the SFHA by ownership. Total road miles were designated by ownership and separated into one of four categories: federal/state-owned, regional/county/city, private, and unknown.

Within the SFHA, federally or state-owned roads represent approximately 20 percent of road miles, which is higher than within the Oregon plan area at large (5 percent). MPO, county, and city owned roads have the largest share at approximately 73 percent. The ODOT data from which these numbers were derived is compiled from numerous sources throughout the state. Each dataset is from the road authority responsible for, or assigned data maintenance responsibility for, the road type. Privately held roads may or may not be reported. The only owner listed under the private category is GeoComm, a GIS-based map data management company. Other privately held roads, such as those owned and managed by Port Blakely, a private forestry company and landowner, may not be included in the road authority data transmitted to ODOT, although it is also possible that such roads may be listed under unknown ownership. Unknown owners and privately owned roads comprise approximately 6 percent of the total road miles in the SFHA. Local access is defined by the ODOT 2023 Oregon Mileage Report as roads that are deeded to the county but are not maintained by the county (ODOT 2023b). This was verified by identifying an access road (Dillard access road in Lane County) and identifying that the owner was listed as the applicable county. Because **Table 4.19** lists

[53] The Road Maintenance Water Quality and Habitat Guide (also known as Blue Book) is required to be updated every 5 years.

[54] Does not include certain roads on federal lands (e.g., roads on National Forest land), which would not be subject to the alternatives.

roads under ownership, local access roads would be included in the 'MPO, city, and county owned' category.

Table 4.19. Road Mileage by Owner in the Oregon Plan Area and the SFHA

Roads	Road Miles in SFHA	Percentage of Total Miles in SFHA
Federal and State Owned[1]	471	20.4%
MPO, City, and County Owned	1,686	73.1%
Privately Owned	2	0.1%
Unknown Ownership	146	6.3%
Total	**2,305**	**100%**

Source: ODOT 2023a, CDM Smith GIS analysis
1. State and federal roads is a combination of interstate highways, U.S. highways, and state roads as well as roads on federal lands because federal agencies are not NFIP participating communities.

There are many federal land management agencies that own and manage land, and therefore roads, in the Oregon plan area and SFHA. These include the Bureau of Land Management, USDA, the U.S. Department of Energy, and the U.S. Forest Service. Federally owned lands are not subject to the NFIP alternatives. Therefore, such roads are not included in the road ownership summary because implementation of the no net loss standards would not be applicable.

Roads on Tribal Nation lands are owned by a combination of entities. In addition to the federal, state, and county roads included in the road ownership categories in the tables above, some roads on Tribal lands may also be owned or managed by the Bureau of Indian Affairs or the Tribe that owns the land (Confederated Tribes of the Umatilla Indian Reservation [CTUIR] 2023). There are roads shown in Tribal plans that are not shown in publicly available GIS data (ODOT 2023a). As such, some road miles on Tribal land are incorporated in the miles shown in **Table 4.18** and **Table 4.19**, but not all.

GIS data by ODOT is also available for the number of bridges in Oregon owned by the state, cities, counties, and other owners such as railroad bridges. There are approximately 8,970 bridges in the Oregon plan area, approximately 3,540 of which are also located in the SFHA (39.4 percent) (ODOT 2024a). This data does not include bridges owned by federal agencies. As with roads, cities, counties, or other local jurisdictions own the majority of bridges (61 percent) (ODOT 2024a). ODOT data tends to show public data and is not likely to include privately owned bridges; therefore, bridges owned by private entities such as the nine permanent steel bridges owned by Port Blakely are likely not included in the data shown (Clackamas County 2023).

Railways are often in areas with more gradual elevation changes. Of the 3,130 miles of rail line within the Oregon plan area, 280 miles are within the SFHA, which corresponds to 8.9 percent (ODOT 2024b).

Ports and ferries, by nature, are found in proximity to waterways. Oregon has 22 ports, all of which are within the Oregon plan area and a number of ferries such as the Buena Vista Ferry along the Willamette River. Data limitations do not support identifying the number of ferries within Oregon.

4.15.3. EXISTING CONDITIONS — DEVELOPMENT

Under existing conditions, development of transportation infrastructure within the SFHA may result in impacts on floodplain functions from the placement of fill or structures, increases in impervious surface area, and removal of trees. Maintenance of transportation infrastructure often entails repaving, which may result in additional fill in the SFHA if the resulting pavement is thicker. Maintenance of bridges and ports may involve in-water work, which could have impacts on water quality.

Road design and safety standards would remain primarily regulated and guided by FHWA and ODOT. The State of Oregon, counties, MPOs, cities, towns, and Tribes that build or construct roads would comply with applicable federal and state guidelines.

Transportation infrastructure conditions decline over time if they are not maintained and eventually replaced. Infrastructure in poor condition may need to be closed to certain types of traffic or loads or closed completely resulting in long detours, traffic disruptions, and adverse impacts on emergency access and response times. Damaged transportation infrastructure that is not promptly repaired could create hazards for the traveling public and could increase the risk of erosion or the potential for damage to other infrastructure, such as utilities, that may be in or alongside the road (Agarwal et al. 2013). The transportation infrastructure in the most need of repair and maintenance in Oregon is bridges, 39 percent of which are found in the SFHA. Current funding levels for bridge replacement in Oregon are only sufficient to replace three bridges each year, which is inadequate to maintain the inventory of bridges in serviceable condition (ODOT 2023c).

4.15.4. SIGNIFICANCE CRITERIA

An evaluation of impacts on transportation involves a comparison of the effects of the alternatives on the ability of the transportation infrastructure to construct, operate, and maintain roads and other infrastructure related to transportation in the SFHA. There is the potential for significant impacts on transportation when an alternative:

- Creates a hazard to the public or the environment due to changes in design, construction, operation, or maintenance of roads and other transportation infrastructure.
- Creates conditions that could result in reasonably foreseeable hazards to the traveling public or the environment that exceed the potential for such hazards under existing conditions.
- Delay safety upgrades to transportation infrastructure required to comply with the most updated design standards.

4.15.5. IMPACTS COMMON TO ALL ALTERNATIVES

The alternatives would not be reasonably expected to alter the amount or type of transportation infrastructure in the Oregon plan area. The alternatives would adhere to and would not alter federal and state transportation regulations.

4.15.6. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. Because implementation of the NFIP would remain unchanged, there would be no change in impacts related to the design, construction, operation, or maintenance of transportation infrastructure and reasonably foreseeable hazards to the traveling public compared to existing conditions (Section 4.15.3). As discussed under impacts common to all alternatives (Section 4.15.5), federal and state transportation regulations would not be altered. Because the No Action Alternative would not change impacts related to transportation compared to existing conditions, the NEPA finding is **no impact** compared to existing conditions.

4.15.7. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. Many state and local transportation projects, including both construction of new and maintenance of existing infrastructure, would have a federal nexus and therefore can be expected to obtain project-specific ESA compliance documentation. In addition, bridge and port projects in the SFHA would likely involve in-water work and require federal permits that would be expected to obtain project-specific ESA compliance. The no net loss standards would not apply to these projects. The no net loss standards also would not apply to certain maintenance projects on state-owned roads that are covered under ODOT's Routine Road Maintenance Program Section 4(d) authorization. Further, no net loss standards would not apply to normal street, sidewalk, road, facility, and utility maintenance that occurs within the existing footprint of the infrastructure.

The no net loss standards would apply to transportation projects without a federal nexus and could include state, local, and private projects to construct new transportation infrastructure or for repairs and maintenance that extend beyond the existing footprint of the infrastructure. The no net loss standards are most likely to apply to MPO, county, city, or Tribal owned transportation infrastructure projects as there is less likelihood of a federal nexus within those ownership categories.

Implementing the no net loss standards could increase the cost and complexity (e.g., design, review, permitting) of an individual transportation project such that it is delayed or changes to the design are needed to avoid and minimize impacts on the three floodplain functions. Delayed projects could temporarily reduce access, increase traffic congestion, delay safety improvements (e.g., adding shoulders), or result in increased costs that lead to fewer improvements being constructed. Impacts from delays of an individual transportation project would be localized, **minor, long-term, and adverse**. Impacts on an individual transportation project would be unlikely to create a public hazard because transportation infrastructure could be maintained without the cost and complexity of the no net loss

standards and expansions. However, the potential delay of upgrades to comply with current safety standards would **be significant.**

Some development could be influenced to move outside of the SFHA to avoid the cost and complexity of implementing no net loss standards. Development that takes place outside of the SFHA is likely to occur where existing transportation infrastructure already provides access and would be unlikely to alter long-term transportation needs.

As discussed above, under Alternative 2, implementation of the no net loss standards would most likely apply to MPO-, county-, city-, or Tribal-owned transportation projects. At the Oregon plan area scale, Alternative 2 would have a **moderate long-term adverse impact** on local road development and redevelopment due to the increased cost and complexity of implementing the no net loss standards. Impacts would **be significant** because although routine maintenance would not be subject to the no net loss standards and would reasonably occur in a timely manner, safety upgrades and expansions could be delayed or not occur. Many bridge projects would be expected to obtain project-specific ESA compliance through federal permits or funding and would thus be exempt from implementation of no net loss standards; thus, Alternative 2 is not expected to impact all bridge projects.

4.15.8. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. As with Alternative 2, the no net loss standards would not apply to normal street, sidewalk, road, facility, and utility maintenance that occurs within the existing infrastructure footprint. Although project-specific ESA compliance would not exempt a transportation project from the no net loss standards, Path D allows the use of HCPs and Section 4(d) limit authorizations to show compliance with NFIP-ESA integration. As such, certain maintenance projects on existing state-owned roads that are covered under ODOT's Routine Road Maintenance Program Section 4(d) authorization may not be subject to the no net loss standards. Certain forestland transportation projects that are covered under the Port Blakely Habitat Conservation Plan for the John Franklin Eddy Forestlands, or other future HCPs, also may not be subject to the no net loss standards. Potential impacts from an individual transportation project would be as described under Alternative 2, although Alternative 3 would implement the no net loss standards more broadly.

As with Alternative 2, some development could be influenced to occur outside of the SFHA to avoid the cost and complexity of implementing the no net loss standards. Slightly more development would be expected to take place outside of the SFHA under Alternative 3 than Alternative 2 because a larger proportion of transportation development in the SFHA would be subject to the no net loss standards and the associated increase in cost and complexity. Notably, this larger proportion would include bridges, ports, and ferry projects that would be expected to also have project-specific ESA compliance requirements and are dependent on being located near waterways. Increased costs may exceed funding caps, make developing an acceptable benefit-cost ratio more difficult, and potentially result in fewer projects being funded by the same total dollar amount. In addition, transportation infrastructure usually has few to no options to move to alternative locations outside of the SFHA.

Communities may need to incur a larger percentage of the construction costs for transportation infrastructure to meet funding caps or benefit-cost ratios. This could delay needed improvements to infrastructure for safety while alternative funding sources are obtained.

FEMA's Model Project B - Port Improvements offers an example of one type of development (i.e., port improvements) that would reasonably be expected to obtain project-specific ESA compliance and also be subject to the no net loss standards under Alternative 3. The estimated mitigation costs required to meet the no net loss standards for Model Project B - Port Improvements would amount to about $718,235, or an increase of about 2.6 percent (the *Economic Technical Report,* Appendix D, contains a detailed description of cost assumptions).

Therefore, at the Oregon plan area scale, Alternative 3 would have a **moderate long-term adverse impact** on transportation infrastructure due to the increased cost and complexity of implementing the no net loss standards, which would apply more broadly than under Alternative 2. Because bridge, port, and ferry projects would not be exempt from no net loss under Alternative 3, there would also be a **moderate long-term adverse impact** related to construction or expansion of these facilities, which would not occur under Alternative 2. Impacts would **be significant** because although certain maintenance activities could occur without implementing the no net loss standards, safety upgrades could be delayed or not occur.

4.16. Public and Critical Infrastructure, Health, and Safety

Public infrastructure is the structures and facilities that serve public needs, such as power lines for electricity, water supply pipelines, gas pipelines, and roads (transportation infrastructure is discussed in Section 4.15). Critical infrastructure is the systems and assets that are vital to the functioning of society and generally includes utilities, such as power generation facilities, water and wastewater facilities, police, fire and emergency medical services, and hospitals.

4.16.1. EXISTING CONDITIONS

Within the Oregon plan area, electricity is provided by cooperative-owned utilities (e.g., Columbia Basin Cooperative), investor-owned utilities (e.g., Pacific Power), municipal electric utilities (e.g., City of Cascade Locks), and public utility districts (e.g., Tillamook) (Oregon Department of Energy 2021). Electricity is provided through both overhead and underground lines. Approximately 45 percent of Oregonians rely on groundwater as their source for freshwater, with 23 percent from private wells and 22 percent from public water systems, where water is transported via underground pipes (Oregon Environmental Quality Commission 2022). The other 55 percent of the state receives their drinking water from surface water sources that are typically treated by a public utility before distribution. The use of wells is concentrated in the Willamette River Valley, as well as areas in Josephine, Jackson, and Deschutes Counties (Oregon Environmental Quality Commission 2022). Wastewater is collected through underground pipe systems and conveyed to wastewater treatment plants where it is treated, or it is managed on-site via private or community septic tanks. Wastewater treatment plants are often located along waterways within the SFHA. Dams, levees, revetments, pump stations, and other water-dependent infrastructure are also prominent in Oregon.

Police and fire departments are dispersed across the Oregon plan area and are generally run by the local government (e.g., city or county) with some volunteer services. Similarly, hospitals and emergency service providers are dispersed across the Oregon plan area and are either privately or publicly owned and operated.

4.16.2. EXISTING CONDITIONS — DEVELOPMENT

An individual development under existing conditions generally would not limit the function of or access to local emergency services or critical infrastructure unless the development was directly related to a public service (e.g., expanding a fire station, undergrounding electrical lines). However, development related to public and critical infrastructure is typically performed in a manner that avoids and minimizes disruption of service because the infrastructure is vital to the health and welfare of communities. Temporary disruptions of the function or access to public and critical infrastructure and the services they provide would be reasonably expected to be communicated through outreach (e.g., notification of temporary power outages) and minimized through planning efforts (e.g., temporary adjustment of service boundary for police). Further, temporary disruptions would be expected to be localized, only affecting a portion of a community at a time rather than the entire community.

Under existing conditions, development within the SFHA would continue to reduce flood storage capacity, pervious surfaces, and trees. Reducing flood storage capacity would alter floodplain dynamics and reduced pervious surface would prevent contaminants in stormwater runoff from infiltrating into the ground where soils and plants filter out the pollutants. This could result in an increase of non-point source pollutants in surface and groundwater, which are the drinking water sources in Oregon. A reduction of pervious surface also results in more stormwater runoff reaching public conveyance and collection systems, potentially increasing the volume of wastewater at a local treatment plant. This could overwhelm a plant during a storm, resulting in releases of untreated wastewater into surface waters, and larger volumes of stormwater may necessitate wastewater system expansions. Similarly, trees remove, decompose, and stabilize contaminants in soils and groundwater through biological processes (EPA 2012). Trees also intercept precipitation and thus reduce the volume of stormwater runoff. Therefore, reducing the number of trees could result in contaminants in groundwater remaining for longer periods of time or in greater stormwater runoff volumes.

4.16.3. SIGNIFICANCE CRITERIA

There is the potential for significant impacts to occur when an alternative:

- Limits the function of or access to local emergency services (e.g., hospitals, fire stations).
- Limits the function of or access to critical infrastructure or requires expansion of water or wastewater treatment facilities capacity.

4.16.4. IMPACTS COMMON TO ALL ALTERNATIVES

None of the alternatives would alter the amount or anticipated rate of development across the plan area, which is driven by population and economic growth drivers (Section 4.1.1.1). Continued development in the SFHA of the Oregon plan area is anticipated in NFIP participating communities under all alternatives, as described in Section 4.2. The economic benefits of community participation in the NFIP (Section 4.3.3) would remain available under all alternatives. Communities would retain access to federal financial assistance (e.g., EPA funding programs) that support the repair, expansion, and upgrade of public and critical infrastructure in the SFHA. For example, the EPA's Clean Water State Revolving Fund provides communities low-cost financing for a wide range of water quality infrastructure projects. Continued access to federally underwritten flood insurance and federal financial assistance supports repairing public and critical infrastructure damaged by floods to minimize service disruptions.

4.16.5. NO ACTION ALTERNATIVE

Under the No Action Alternative, implementation of the NFIP in the Oregon plan area would continue as described in Section 1.2 and Section 1.3. Because implementation of the NFIP would remain unchanged, there would be no change in impacts compared to existing conditions (Section 4.16.2). Because the No Action Alternative would not change impacts related to public and critical infrastructure, health, and safety compared to existing conditions, the NEPA finding is **no impact** compared to existing conditions.

4.16.6. ALTERNATIVE 2

Under Alternative 2, developers in the SFHA would implement the no net loss standards unless project-specific ESA compliance documentation was obtained through other means. As discussed in Section 4.1.1.3, development with project-specific ESA compliance generally represents larger infrastructure projects, which may include certain public and critical infrastructure.

As discussed under existing conditions in Section 4.16.2, an individual development generally would not limit the function of or access to local emergency services or critical infrastructure. Because of the additional construction required to implement the no net loss standards, there would be a slightly increased potential for an individual development to disrupt local services and utilities as compared to existing conditions and therefore, the No Action Alternative. However, temporary disruptions would be communicated through outreach, minimized through planning efforts, and temporary disruptions would be localized. Thus, impacts for an individual development would be as described under existing conditions in Section 4.16.2 and the NEPA finding is **no impact** compared to the No Action Alternative.

Maintenance of structures within the existing footprint of the structure would not be subject to the no net loss standards (Section 3.3.3). As such, the cost of implementing the no net loss standards would not impact certain maintenance of public and critical infrastructure projects (e.g., replacing aged power lines within the footprint of the existing power lines, maintaining a well). This would avoid potential disruptions of service associated with the inability to make repairs due to increased costs.

However, improvements aimed at reducing damage or increasing resilience (e.g., installing pump stations, undergrounding utilities) or to expand service (e.g., extending water lines to a new neighborhood) would increase in cost and complexity. The cost of implementing the no net loss standards may lead project proponents to reduce the scope or number of public and critical infrastructure improvements or extend the duration of implementation because it may take longer to secure adequate funding for an increased cost share.

Some critical infrastructure projects would have a federal nexus and thus would obtain project-specific ESA compliance and not be subject to the no net loss standards. Therefore, the cost of implementing the no net loss standards would only apply to a portion of public and critical infrastructure developments in the SFHA.

Implementation of the no net loss standards for pervious surface and trees would help maintain the existing condition of water infiltrating into the ground, where soils and plants filter contaminants and could result in the improved decomposition of soil contaminants from trees compared to the No Action Alternative. However, improvements would likely be slight and localized because not all trees would be planted in the same place, trees may not be planted in contaminated soils or survive to maturity, and trees could take decades to result in measurable improvements.

At the Oregon plan area scale, the cost of implementing the no net loss standards for development without a federal nexus may lead some communities to decide that maintaining and repairing certain existing aging infrastructure is preferable to constructing new or improved infrastructure. Expansion of facilities to meet the needs of population growth and economic development may also be deferred longer than is desirable in some communities. These decisions could adversely affect public health and safety depending on the type of infrastructure. For example, a wastewater treatment plant that does not expand to keep up with the community's growth may have more releases of untreated sewage into the local surface waters than under the existing condition. If the plant has the capacity to treat the projected volume of municipal sewage, a decision may be made to defer expansion even though there may be less excess capacity to handle stormwater during storm events, resulting in more overflow incidents. The construction of, or improvement to, a treatment process that requires new impervious surface or reduces flood storage capacity might be deferred and result in lost opportunities to improve the water quality of discharges.

Under Alternative 2, the cost and complexity (e.g., design, review) of implementing the no net loss standards may prolong the project timeline of new or improved public and critical infrastructure or even result in a project becoming cost prohibitive. The increased cost and complexity of implementing the no net loss standards could reduce a community's ability to provide services or to comply with state and federal regulations related to the utility. Although many types of projects (e.g., maintenance and repairs with no change in footprint, or development with a federal nexus) could occur without the need to implement the no net loss standards, development projects that do not have a federal nexus could have adverse effects. Therefore, Alternative 2 would have a **minor long-term adverse impact** on public and critical infrastructure, health, and safety if the construction of new or improved infrastructure without a federal nexus is delayed or becomes cost prohibitive. Impacts **would be significant** because delayed improvements to, or limited ability to construct, public and critical

infrastructure could result in limited functions or access to services. In addition, Alternative 2 would have a **negligible long-term beneficial effect** compared to the No Action Alternative from implementing the no net loss mitigation ratio for tree replacement, which could result in improvements to the exposure of contaminants in surface and groundwater as trees mature.

4.16.7. ALTERNATIVE 3

Under Alternative 3, development in the SFHA would be subject to the no net loss standards regardless of whether it has project-specific ESA compliance through other means. As with Alternative 2, an individual development could temporarily and locally limit the function or access of local emergency services or critical infrastructure. Impacts for an individual development would be as described under existing conditions in Section 4.16.2 and the NEPA finding is **no impact** compared to existing conditions.

As with Alternative 2, the maintenance of existing structures within the existing footprint of a structure would not be subject to the no net loss standards. However, development with project-specific ESA compliance would need to implement both the no net loss standards and any required ESA compliance measures, which would increase project costs. The increased costs may make federal financial assistance more difficult to obtain. Increased costs may exceed funding caps, make developing an acceptable benefit-cost ratio more difficult, and potentially result in fewer projects being funded by the funding agency. The inability to obtain certain federal financial assistance may result in communities incurring a larger percentage of the construction costs or deferring projects.

Implementing the no net loss standards for water quality and vegetation for a larger proportion of developments would increase benefits related to surface and groundwater contaminant reduction in the SFHA compared to Alternative 2. However, as described under Alternative 2, surface and groundwater contaminant reduction would be slight and localized.

At the Oregon plan area scale, the cost of implementing the no net loss standards may lead some communities to decide that maintaining and repairing existing aging infrastructure is preferable to constructing new or improved infrastructure. As described under Alternative 2, there could be adverse impacts on public health and safety from deferring or delaying projects to improve capacity or update processes. The construction of new or improved public and critical infrastructure may be prolonged or become cost prohibitive. In addition, certain federal assistance may become more difficult to obtain if increased costs associated with the no net loss standards exceed funding caps or make developing an acceptable benefit-cost ratio more difficult. Therefore, Alternative 3 would have a **moderate long-term adverse impact** on public and critical infrastructure, health, and safety. Impacts **would be significant** because delayed improvements to, or inability to construct, public and critical infrastructure could result in limited function of or access to such facilities. In addition, Alternative 3 would have a **negligible long-term beneficial effect** compared to the No Action Alternative from implementing the no net loss mitigation ratio for tree replacement, which, could result in an improvement to the exposure of contaminants in surface and groundwater over time should all trees grow to maturity.

4.17. Resources with Minimal Impacts

Resources determined to have minimal impacts are analyzed in Appendix K. A summary of the impact determination is provided in **Table 4.20**.

4.18. Unavoidable Adverse Impacts

The CEQ NEPA implementing guidance (formerly at 40 CFR 1502.16) requires that an EIS evaluate the unavoidable adverse impacts from implementation of the alternatives. The alternatives do not involve authorizing, funding, undertaking, or encouraging development in the SFHA. Therefore, there would be no direct impacts from the alternatives aside from direct costs to FEMA for implementation as discussed in Section 4.1. However, future development in the SFHA is reasonably foreseeable and would result in indirect impacts on resources.

Table 4.21 depicts impacts and beneficial effects on physical and social resources such as land use and transportation as well as resources with minimal impacts. **Table 4.22** depicts economic impacts and beneficial effects and **Table 4.23** depicts impacts and beneficial effects on water and biological resources.

As detailed in Section 4.1.1.3, FEMA assumes that approximately 16 percent of development in the SFHA of NFIP participating communities can be reasonably expected to have project-specific ESA compliance and would result in ground disturbance that would impact the three floodplain functions. As such, approximately 16 percent of development in the SFHA of NFIP participating communities would be subject to the no net loss standards under Alternative 3 but not under Alternative 2. The impact determinations in this Chapter and in **Table 4.21** to **Table 4.23** reflect this 16 percent assumption. However, any given NFIP participating community, developer, or agency (e.g., FEMA funding projects through BRIC, ODOT) may experience a higher proportion of projects in the SFHA that would obtain project-specific ESA compliance and also result in impacts on the three floodplain functions, as measured by proxy. These individual proportions over 16 percent are assumed to be up to 30 percent based on FEMA's analysis of grant program data (Section 4.1.1.3). Should an NFIP participating community or agency experience a higher percentage of development with project-specific ESA compliance, the impacts and potential benefits identified under Alternative 2 would generally lessen; the impacts and potential benefits under Alternative 3 would generally increase. This is not a direct relationship because there are numerous decisions any developer could make (e.g., design, location of development relative to SFHA) that would affect impacts on the three floodplain functions and associated project costs.

Table 4.20. Resources with Minimal Impacts

Resource	Scale	No Action Alternative	Alternative 2	Alternative 3
Farmland Soils	Individual Development	**No impact** compared to existing conditions.	**Negligible long-term adverse impact** from potential conversion of farmland, increased compared to No Action	**Negligible long-term adverse impact** from potential conversion of farmland, increased compared to Alternative 2
	Oregon Plan Area	**No impact** compared to existing conditions.	**Minor long-term adverse impact** because no net loss would require the removal of topsoil	**Minor long-term adverse impact** because no net loss would require the removal of topsoil; however, increased compared to Alternative 2
Air Quality	Individual Development	**No impact** compared to existing conditions.	**Negligible short-term adverse impact** from construction emissions, increased compared to No Action	**Negligible short-term adverse impact** from construction emissions, increased compared to Alternative 2
	Oregon Plan Area	**No impact** compared to existing conditions.	**Negligible short-term adverse impact** because the increase of emissions to implement no net loss would be nondetectable or slight, temporary, and localized; however, increased compared to No Action **Negligible long-term beneficial effect** compared to No Action Alternative because the replanting of trees at more than a 1 to 1 ratio would result in a larger number of trees within the SFHA thereby improving air quality, albeit nondetectable or slightly	**Negligible short-term adverse impact** because the increase of emissions to implement no net loss would be nondetectable or slight, temporary, and localized; however, increased compared to Alternative 2 **Negligible long-term beneficial effect** compared to No Action Alternative because the replanting of trees at more than a 1 to 1 ratio would result in a larger number of trees within the SFHA thereby improving air quality, albeit nondetectable or slightly
Wild and Scenic Rivers	Individual Development	**No impact** compared to existing conditions.	**Negligible short-term adverse impact** due to visual impairment of certain development along the Salmon River **Negligible long-term beneficial effect** compared to No Action Alternative because no net loss maintains values under which rivers are designated	**Negligible short-term adverse impact** due to visual impairment of certain development along the Salmon River; however, increased compared to Alternative 2 **Negligible long-term beneficial effect** because no net loss maintains values under which rivers are designated; however, increased compared to Alternative 2
	Oregon Plan Area	**No impact** compared to existing conditions.	**Negligible short-term adverse impact** from visual impairment of certain development along the Salmon River (6.6 miles could be impacted) associated with implementing the no net loss standards **Negligible long-term beneficial effect** compared to No Action Alternative because no net loss maintains values under which rivers are designated	**Negligible short-term adverse impact** from visual impairment of certain development along the Salmon River (6.6 miles could be impacted) associated with implementing the no net loss standards; however, increased compared to Alternative 2 **Minor long-term beneficial effect** compared to No Action Alternative because no net loss maintains values under which rivers are designated; however, increased compared to Alternative 2
Coastal Resources	Individual Development	**No impact** compared to existing conditions.	**Negligible short-term adverse impact** from potential to alter floodwater patterns, which can reduce coastal habitat **Negligible long-term beneficial effect** compared to No Action Alternative from maintaining water quality and potentially increasing the number of trees	**Negligible short-term adverse impact** from potential to alter floodwater patterns, which can reduce coastal habitat; however, increased compared to Alternative 2 **Negligible long-term beneficial effect** compared to No Action Alternative from maintaining water quality and potentially increasing the number of trees; however, increased compared to Alternative 2
	Oregon Plan Area	**No impact** compared to existing conditions.	**Minor short-term adverse impact** from no net loss of flood storage potential to reduce water flows downstream and alter sediment transport (5 percent of Oregon plan area may be impacted) **Minor long-term beneficial effect** compared to No Action Alternative from maintaining water quality and potentially increasing the number of trees	**Minor short-term adverse impact** from no net loss of flood storage potential to reduce water flows downstream and alter sediment transport (5 percent of Oregon plan area may be impacted); however, increased compared to Alternative 2 **Minor long-term beneficial effect** compared to No Action Alternative from maintaining water quality and potentially increasing the number of trees; however, increased compared to Alternative 2
Noise	Individual Development	**No impact** compared to existing conditions. **No impact** compared to existing conditions.	**Negligible short-term adverse impact** from the use of equipment; however, slight increase compared to No Action **No long-term impact** on noise levels	**Negligible short-term adverse impact** from the use of equipment; however, slight increase compared to Alternative 2 **No long-term impact** on noise levels
	Oregon Plan Area	**No impact** compared to existing conditions.	**Negligible long-term beneficial effect** compared to No Action Alternative from implementation of no net loss, depending on the density of vegetation that would accumulate over time	**Negligible to minor long-term beneficial effect** compared to No Action Alternative from implementation of no net loss, depending on the density of vegetation that would accumulate over time

Table 4.21. Impacts Summary

Resource	Scale	No Action Alternative	Alternative 2	Alternative 3
Land Use	Individual Development	**No impact** compared to existing conditions.	**Minor and significant long-term adverse impact** on development and land use from the additional land required for mitigation, which may conflict with local comprehensive plans and zoning.	**Moderate and significant long-term adverse impact** on development and land use from the additional land required for mitigation, which may conflict with local comprehensive plans and zoning.
	Oregon Plan Area	**No impact** compared to existing conditions.	**Major and significant long-term adverse impact** on land development and use from the potential for some development to move outside of the SFHA due to increased costs for mitigation, the use of land in the SFHA for mitigation thereby reducing development potential and associated potential need for UGB expansion.	**Major and significant long-term adverse impact** on land development and use from the potential for some development to move outside of the SFHA due to increased costs for mitigation, the use of land in the SFHA for mitigation thereby reducing development potential and increased conflicts with zoning, and the increased cost and complexity of obtaining federal financial assistance; however, increased compared to Alternative 2.
Seismicity, Geology, Topography, Soils	Individual Development	**No impact** compared to existing conditions.	**No impact** on seismicity and geology. **Minor short- and long-term adverse impact** from removal of soils from the SFHA for replacement flood storage capacity, which alters topography. **Negligible long-term beneficial effect** compared to the No Action Alternative by decreasing the risk of erosion associated with reduced pervious surfaces and maintaining soil stability associated with trees.	**No impact** on seismicity and geology. **Minor short- and long-term adverse impact** from removal of soils from the SFHA for replacement flood storage capacity, which alters topography; however, increased compared to Alternative 2. **Negligible long-term beneficial effect** compared to No Action Alternative decreasing the risk of erosion associated with reduced pervious surfaces and maintaining soil stability associated with trees; however, increased compared to Alternative 2.
	Oregon Plan Area	**No impact** compared to existing conditions.	**No impact** on seismicity and geology. **Minor short- and long-term adverse impact** from increased ground disturbance, which alters topography and makes revegetation more difficult. **Negligible long-term beneficial effect** compared to the No Action Alternative decreasing the risk of erosion associated with reduced pervious surfaces and maintaining soil stability associated with trees.	**No impact** on seismicity and geology. **Moderate short- and long-term adverse impact** from increased ground disturbance, which alters topography and makes revegetation more difficult. **Negligible long-term beneficial effect** compared to No Action Alternative decreasing the risk of erosion associated with reduced pervious surfaces and maintaining or improving soil stability associated with trees; however, increased compared to Alternative 2.
Cultural and Historic Resources	Oregon Plan Area	**No impact** compared to existing conditions.	**Negligible adverse impact** on historic structures from development that alters all or part of a historic property if the NHPA or the Secretary of Interior's Standards for Rehabilitation do not apply to that property. **Moderate adverse impact** on archaeological resources from the implementation of the no net loss standards increasing the risk of encountering archaeological objects and sites in the SFHA **Negligible beneficial effect** compared to the No Action Alternative from the potential shift of development outside of the SFHA, which could reduce the likelihood of encountering, disturbing, or damaging unknown archaeological resources	**Negligible adverse impact** on historic structures from development that alters all or part of a historic property if the NHPA or the Secretary of Interior's Standards for Rehabilitation do not apply to that property. **Moderate adverse impact** on archaeological resources from the implementation of the no net loss standards increasing the risk of encountering archaeological objects and sites in the SFHA **Negligible beneficial effect** compared to the No Action Alternative from the potential shift of development outside of the SFHA, which could reduce the likelihood of encountering, disturbing, or damaging unknown archaeological resources
Tribal Treaty Rights	Oregon Plan Area	**Major and significant adverse impact** because the continued existence of ESA-listed species or their critical habitat would remain jeopardized, including fish species protected under Tribal treaty rights.	**Minor short-term adverse impact** associated with action to implement the no net loss standards. **Negligible long-term beneficial effect** compared to the No Action Alternative from maintaining existing floodplain functions for aquatic species.	**Minor short-term adverse impact** associated with action to implement the no net loss standards. **Negligible long-term beneficial effect** compared to the No Action Alternative from maintaining existing floodplain functions for aquatic species.
Hazardous Materials	Individual Development	**No impact** compared to existing conditions.	**No impact** compared to existing conditions (and therefore the No Action Alternative) because existing federal and state regulations would continue to ensure that the generation, transport, storage, and disposal of hazardous materials avoids and minimizes risk to health and safety	**No impact** compared to existing conditions (and therefore the No Action Alternative) because existing federal and state regulations would continue to ensure that the generation, transport, storage, and disposal of hazardous materials avoids and minimizes risk to health and safety.

Resource	Scale	No Action Alternative	Alternative 2	Alternative 3
	Oregon Plan Area	**No impact** compared to existing conditions.	**Negligible long-term adverse impact** on hazardous materials because the potential for changes in floodplain dynamics would be unlikely to result in increased flood damage to facilities or an increased exposure to hazardous materials. **Negligible long-term beneficial effect** compared to the No Action Alternative because the amount of pervious surface in the SFHA would generally be maintained, and the increased number of trees would slightly and locally reduce contaminants in soil.	**Negligible long-term adverse impact** on hazardous materials because the potential for changes in floodplain dynamics would be unlikely to result in increased flood damage to facilities or an increased exposure to hazardous materials. **Negligible long-term beneficial effect** compared to the No Action Alternative because the amount of pervious surface in the SFHA would generally be maintained, and the increased number of trees would slightly and locally reduce contaminants in soil.
Transportation	Individual Development	**No impact** compared to existing conditions.	**No impact** on bridges, which would be expected to obtain project-specific ESA compliance. **Minor and significant long-term adverse impact** from increased cost and complexity, which may prolong implementation or necessitate design changes.	**Minor and significant long-term adverse impact** on bridges, because no net loss would apply regardless of project-specific ESA compliance, which would increase costs and complexity. **Minor and significant long-term adverse impact** from increased cost and complexity, which may prolong implementation or necessitate design changes.
	Oregon Plan Area	**No impact** compared to existing conditions.	**No impact** on bridges, which would be expected to obtain project-specific ESA compliance. **Moderate and significant long-term adverse impact** on roads from increased cost and complexity, which may prolong implementation or necessitate design changes; potential change in location of road development.	**Moderate and significant long-term adverse impact** on bridges from increased cost and complexity, which may prolong implementation or necessitate design changes. **Moderate and significant long-term adverse impact** on roads from increased cost and complexity, which may prolong implementation or necessitate design changes; potential change in location of road development.
Public and Critical Infrastructure, Health, and Safety	Individual Development	**No impact** compared to existing conditions.	**No impact** compared to existing conditions (and therefore the No Action Alternative).	**No impact** compared to existing conditions (and therefore the No Action Alternative).
	Oregon Plan Area	**No impact** compared to existing conditions.	**Minor and significant long-term adverse impact** on public and critical infrastructure, health, and safety if the construction of new or improved infrastructure is prolonged or becomes cost prohibitive. **Negligible long-term beneficial effect** compared to the No Action Alternative from implementing the no net loss standards for vegetation, which could result in an improvement to the exposure of contaminants in surface and groundwater over time.	**Moderate and significant long-term adverse impact** because the construction of new or improved infrastructure is more likely to be prolonged or become cost prohibitive due to the increase complexity if obtaining federal financial assistance. **Negligible long-term beneficial effect** compared to the No Action Alternative from implementing the no net loss standards for vegetation, which could result in an improvement to the exposure of contaminants in surface and groundwater over time.
Resources with Minimal Impacts				
Farmland Soils	Individual Development	**No impact** compared to existing conditions.	**Negligible long-term adverse impact** from potential conversion of farmland, increased compared to No Action.	**Negligible long-term adverse impact** from potential conversion of farmland, increased compared to Alternative 2.
	Oregon Plan Area	**No impact** compared to existing conditions.	**Minor long-term adverse impact** because no net loss would require the removal of topsoil.	**Minor long-term adverse impact** because no net loss would require the removal of topsoil; however, increased compared to Alternative 2.
Air Quality	Individual Development	**No impact** compared to existing conditions.	**Negligible short-term adverse impact** from construction emissions, increased compared to No Action.	**Negligible short-term adverse impact** from construction emissions, increased compared to Alternative 2.
	Oregon Plan Area	**No impact** compared to existing conditions.	**Negligible short-term adverse impact** because the increase of emissions to implement no net loss would be nondetectable or slight, temporary, and localized; however, increased compared to No Action. **Negligible long-term beneficial effect** compared to No Action Alternative because the replanting of trees at more than a 1 to 1 ratio would result in a larger number of trees within the SFHA thereby improving air quality, albeit nondetectable or slightly.	**Negligible short-term adverse impact** because the increase of emissions to implement no net loss would be nondetectable or slight, temporary, and localized; however, increased compared to Alternative 2. **Negligible long-term beneficial effect** compared to No Action Alternative because the replanting of trees at more than a 1 to 1 ratio would result in a larger number of trees within the SFHA thereby improving air quality, albeit nondetectable or slightly.

Resource	Scale	No Action Alternative	Alternative 2	Alternative 3
Wild and Scenic Rivers	Individual Development	**No impact** compared to existing conditions.	**Negligible short-term adverse impact** due to visual impairment of certain development along the Salmon River. **Negligible long-term beneficial effect** compared to No Action Alternative because no net loss maintains values under which rivers are designated.	**Negligible short-term adverse impact** due to visual impairment of certain development along the Salmon River; however, increased compared to Alternative 2. **Negligible long-term beneficial effect** because no net loss maintains values under which rivers are designated; however, increased compared to Alternative 2.
	Oregon Plan Area	**No impact** compared to existing conditions.	**Negligible short-term adverse impact** from visual impairment of certain development along the Salmon River (6.6 miles could be impacted) associated with implementing the no net loss standards. **Negligible long-term beneficial effect** compared to No Action Alternative because no net loss maintains values under which rivers are designated.	**Negligible short-term adverse impact** from visual impairment of certain development along the Salmon River (6.6 miles could be impacted) associated with implementing the no net loss standards; however, increased compared to Alternative 2. **Minor long-term beneficial effect** compared to No Action Alternative because no net loss maintains values under which rivers are designated; however, increased compared to Alternative 2.
Coastal Resources	Individual Development	**No impact** compared to existing conditions.	**Negligible short-term adverse impact** from potential to alter floodwater patterns, which can reduce coastal habitat. **Negligible long-term beneficial effect** compared to No Action Alternative from maintaining water quality and potentially increasing the number of trees.	**Negligible short-term adverse impact** from potential to alter floodwater patterns, which can reduce coastal habitat; however, increased compared to Alternative 2. **Negligible long-term beneficial effect** compared to No Action Alternative from maintaining water quality and potentially increasing the number of trees; however, increased compared to Alternative 2.
	Oregon Plan Area	**No impact** compared to existing conditions.	**Minor short-term adverse impact** from no net loss of flood storage potential to reduce water flows downstream and alter sediment transport (5 percent of Oregon plan area may be impacted). **Minor long-term beneficial effect** compared to No Action Alternative from maintaining water quality and potentially increasing the number of trees.	**Minor short-term adverse impact** from no net loss of flood storage potential to reduce water flows downstream and alter sediment transport (5 percent of Oregon plan area may be impacted); however, increased compared to Alternative 2. **Minor long-term beneficial effect** compared to No Action Alternative from maintaining water quality and potentially increasing the number of trees; however, increased compared to Alternative 2.
Noise	Individual Development	**No impact** compared to existing conditions.	**Negligible short-term adverse impact** from the use of equipment; however, slight increase compared to No Action. **No long-term impact** on noise levels.	**Negligible short-term adverse impact** from the use of equipment; however, slight increase compared to Alternative 2. **No long-term impact** on noise levels.
	Oregon Plan Area	**No impact** compared to existing conditions.	**Negligible long-term beneficial effect** compared to No Action Alternative from implementation of no net loss, depending on the density of vegetation that would accumulate over time.	**Negligible to minor long-term beneficial effect** compared to No Action Alternative from implementation of no net loss, depending on the density of vegetation that would accumulate over time.

Table 4.22. Summary of Economic Impacts

Economic Impact	No Action Alternative	Alternative 2	Alternative 3
NFIP and the Oregon Flood Insurance Market	**No Impact**– NFIP continues to be implemented.	**No Impact** – NFIP continues to be implemented.	**No Impact** – NFIP continues to be implemented.
Impacts on Mortgage Loan Changes	**No Impact**– NFIP continues to be implemented.	**No Impact** – NFIP continues to be implemented.	**No Impact** – NFIP continues to be implemented.
FEMA Financial Assistance in Oregon	**No Impact** – NFIP continues to be implemented.	**No Impact** – NFIP continues to be implemented.	**No Impact** – NFIP continues to be implemented.
Other Federal Agencies	**No Impact**– NFIP continues to be implemented.	**No Impact** – NFIP continues to be implemented.	**No Impact** – NFIP continues to be implemented.
Economics Impact from Implementation of No Net Loss on Developers	**No impact** – no net loss is not implemented.	Potential for **no impact** on already developed property. **Minor to major adverse impact** from the cost to implement no net loss incurred by developers. **Minor to moderate adverse impact** from the decrease in disposable income or profit. **Negligible to minor beneficial effect** from increase in property values; however, a **moderate adverse impact** on large commercial and industrial projects.	Potential for **no impact** on already developed property. **Minor to major adverse impact** from the cost to implement no net loss incurred by developers, up to a **major adverse impact** on port projects and development with project-specific ESA compliance. **Minor to moderate adverse impact** from the decrease in disposable income or profit. **Negligible to moderate beneficial effect** from increase in property values; however, a **moderate adverse impact** on large commercial and industrial projects.
Economics Impact from Implementation of No Net Loss on Communities	**No impact** – no net loss is not implemented.	**Minor to moderate adverse impact** from administrative costs. **Minor beneficial effect** from increased property tax revenues and increased construction costs offsetting diminished disposable income. **Negligible adverse impact** on GDP, up to **minor adverse impact** associated with public lands.	**Minor to moderate adverse impact** from administrative costs. **Minor to moderate beneficial effect** from increased property tax revenues and increased construction costs offsetting diminished disposable income. **Negligible adverse impact** on GDP, up to **major adverse impact** associated with ports and public lands.

Table 4.23. Biological Resources Impact Summary Table

Resource	No Action Alternative	Alternative 2	Alternative 3
Water Quality	**Major long-term adverse impact** based on NMFS determination in the 2016 BiOp of adverse impacts to floodplain functions under existing conditions, including water quality	**Negligible short-term adverse impact** due to increase in construction-related disturbances to implement the no net loss standards. **Negligible to minor long-term beneficial effect** compared to the No Action Alternative because increases in watershed-scale impervious surface coverage would be reduced, but not eliminated, and the floodplain functions of flood storage and trees would be maintained (which supports water quality) with the exception of development with project-specific ESA compliance.	**Minor short-term adverse impact** due to increase in construction-related disturbances to implement the no net loss standards. **Minor long-term beneficial effect** compared to the No Action Alternative because increases in watershed-scale impervious surface coverage would be reduced, but not eliminated, and the floodplain functions of flood storage and trees would be maintained, which supports water quality.
Wetlands	**No impact** compared to existing conditions.	**Localized minor and significant short-term adverse impact** from additional ground disturbance which could result in erosion, sedimentation, or and increase the potential for invasive species coverage. **Localized minor and significant long-term adverse impact** on wetlands from altered floodplain dynamics associated with no net loss of flood storage, which wetlands may recover from over time. **Regional negligible long-term beneficial effect** compared to No Action Alternative because pervious surface and vegetation would be maintained to filter pollutants and support wetland health.	**Localized minor to moderate and significant short-term adverse impact** from additional ground disturbance which could result in erosion, sedimentation, or and increase the potential for invasive species coverage. **Localized minor to moderate and significant long-term adverse impact** on wetlands from altered floodplain dynamics associated with no net loss of flood storage, which wetlands may recover from over time. **Regional negligible long-term beneficial effect** compared to No Action Alternative because pervious surface and vegetation would be maintained to filter pollutants and support wetland health.
Floodplains	**Major long-term adverse impact** based on NMFS determination in the 2016 BiOp of adverse impacts to floodplain functions under existing conditions; however, flood risk management benefits of NFIP participation would remain	**Negligible short-term adverse impact** at the Oregon plan area scale due to temporary disruption of floodplain functions during construction, which would increase to implement no net loss. **Negligible long-term beneficial effect** at the Oregon plan area scale compared to No Action Alternative because vegetation and pervious areas, as well as certain ecosystem services they provide (e.g., shade, woody material, filtering pollutants, erosion risk reduction) would be maintained.	**Negligible short-term adverse impact** at the Oregon plan area scale due to temporary disruption of floodplain functions during construction, which would increase to implement no net loss. **Negligible long-term beneficial effect** at the Oregon plan area scale compared to No Action Alternative because vegetation and pervious areas, as well as certain ecosystem services they provide (e.g., shade, woody material, filtering pollutants, erosion risk reduction) would be maintained.
Vegetation	**Major and significant long-term adverse impact** based on NMFS determination in the 2016 BiOp of destruction or adverse modification of designated or proposed critical habitat and adverse impacts on EFH from vegetation removal and habitat conversion under existing conditions	**Localized minor short- and long-term adverse impact** floodplain obligate and floodplain transitional vegetation in the SFHA from increased ground disturbance to implement no net loss and the potential for flood storage to alter floodplain dynamics **Localized minor long-term adverse impact** on floodplain transitional and non-floodplain vegetation from development that may move outside the SFHA. **Negligible long-term beneficial effect** compared to No Action Alternative from no net loss of trees, as trees mature. **Localized minor long-term beneficial effect** on floodplain obligate vegetation compared to the No Action Alternative due to development shifting outside the SFHA.	**Localized minor to moderate short- and long-term adverse impacts** on floodplain obligate and floodplain transitional vegetation in the SFHA from increased ground disturbance to implement no net loss and the potential for flood storage to alter floodplain dynamics. **Localized minor long-term adverse impact** on floodplain transitional and non-floodplain vegetation from development that may shift outside the SFHA. **Negligible long-term beneficial effect** compared to No Action Alternative from no net loss of trees, as trees mature. **Localized minor long-term beneficial effect** on floodplain obligate vegetation compared to the No Action Alternative due to development moving outside the SFHA.

Resource	No Action Alternative	Alternative 2	Alternative 3
Terrestrial Wildlife	**No impact** on non-floodplain wildlife compared to existing conditions. **Major and significant long-term adverse impact** on floodplain transitional species because floodplain functions would continue to be adversely affected, as under existing conditions described in the NMFS 2016 BiOp.	**Minor short-term adverse impact** on floodplain transitional wildlife from additional ground and habitat disturbance to implement of the no net loss standards in the SFHA. **Localized minor to moderate long-term adverse impact** on floodplain transitional and non-floodplain wildlife from development shifting to non-floodplain habitat outside the SFHA. **Regional negligible to minor long-term adverse impact** on floodplain transitional and non-floodplain wildlife from development shifting to non-floodplain habitat outside the SFHA, which could influence the expansion of UGBs. **Minor long-term beneficial effect** on floodplain transitional wildlife compared to No Action Alternative due to the implementation of the no net loss standards in the SFHA, which maintains habitat. **Localized negligible long-term beneficial effects** on floodplain transitional wildlife by reducing conversion of habitat to development in the SFHA as compared to the No Action Alternative.	**Minor to moderate short-term adverse impact** on floodplain transitional wildlife from additional ground and habitat disturbance to implement of the no net loss standards in the SFHA. **Localized minor short-term adverse impact** on non-floodplain and floodplain transitional species from shift of development outside the SFHA within UGBs. **Localized minor to moderate long-term adverse impact** on floodplain transitional and non-floodplain wildlife from development shifting to non-floodplain habitat outside the SFHA. **Regional negligible to minor long-term adverse impact** on floodplain transitional and non-floodplain wildlife from development shifting to non-floodplain habitat outside the SFHA, which could influence the expansion of UGBs. **Minor to moderate long-term beneficial effect** on floodplain transitional wildlife compared to No Action Alternative due to the implementation of the no net loss standards in the SFHA, which maintains habitat. **Localized negligible long-term beneficial effects** on floodplain transitional wildlife by reducing conversion of habitat to development in the SFHA as compared to the No Action Alternative.
Fish and Aquatic Wildlife	**Major and significant long-term adverse impact** on floodplain obligate species and habitat because EFH would continue to be adversely affected, as under existing conditions described in the NMFS 2016 BiOp.	**Localized minor to moderate short-term adverse impact** on floodplain obligate species and habitat from increased ground disturbance and construction associated with the no net loss standards. **Minor to moderate long-term adverse impact** on aquatic habitat connectivity and migration routes from implementation of the no net loss standards, particularly flood storage. **Moderate to major long-term beneficial effect** on floodplain obligate species from preserving flood storage capacity, pervious surface, and vegetation, and from potential shift in development to outside the SFHA.	**Localized moderate short-term adverse impact** on floodplain obligate species and habitat from increased ground disturbance and construction associated with the no net loss standards. **Moderate long-term adverse impact** on aquatic habitat connectivity and migration routes from implementation of the no net loss standards, particularly flood storage. **Major long-term beneficial effect** on floodplain obligate species from no net loss preserving flood storage capacity, pervious surface, and vegetation, and from potential shift in development to outside the SFHA.
Threatened and Endangered Species	**Major and significant long-term adverse impact** because the continued existence of ESA-listed species would likely be jeopardized and designated critical habitat would be adversely modified, as under existing conditions described in the NMFS 2016 BiOp.	**Localized minor short- and long-term adverse impacts** on floodplain obligate special-status species from increased ground disturbance to implement the no net loss standards, in particular flood storage altering floodplain dynamics and modifying habitat. **Localized minor long-term adverse impacts** on floodplain obligate and floodplain transitional special-status species from continued loss of flood storage capacity, pervious surface, and trees from development with project-specific ESA compliance. **Moderate to major long-term beneficial effect** on floodplain obligate special-status species within the SFHA compared to No Action Alternative from maintaining floodplain functions and shifting development patterns. **Localized minor long-term adverse impacts** on floodplain transitional special-status species from increased ground disturbance to implement the no net loss standards. **Localized minor long-term adverse impacts** on non-floodplain special-status species from potential shift of some development out of the SFHA.	**Localized minor to moderate short- and long-term adverse impacts** on floodplain obligate special-status species from increased ground disturbance to implement the no net loss standards, in particular flood storage altering floodplain dynamics and modifying habitat. **Major long-term beneficial effect** on floodplain obligate special-status species within the SFHA compared to No Action Alternative from maintaining floodplain functions and shifting development patterns. **Localized minor long-term adverse impacts** on floodplain transitional special-status species from increased ground disturbance to implement the no net loss standards. **Localized minor long-term adverse impacts** on non-floodplain special-status species from potential shift of some development out of the SFHA.

4.19. Irreversible or Irretrievable Commitment of Resources

Irreversible and irretrievable commitment of resources consist of impacts on or losses to resources that cannot be recovered or reversed from Alternative 2 and Alternative 3. This discussion involves only nonrenewable resources or resources that are renewable only over a very long period. Examples include permanent conversion of wetlands through fill or other means, loss of populations of endangered species, or riverbed erosion and sedimentation.

Alternative 2 and Alternative 3 do not involve authorizing, funding, undertaking, or encouraging development in the SFHA. As such, there would be no physical development or ground disturbance in the SFHA that would occur as part of or at the same time and place as FEMA's implementation of an alternative. Therefore, there would be no direct impacts from the alternatives that could result in losses to resources that cannot be recovered or reversed other than the direct costs to FEMA for implementation.

Indirect impacts that could occur would be dependent upon continued development in the SFHA, which is authorized by NFIP-participating communities and subsequently carried out locally. SFHA development occurs at the discretion of the developer, who can choose to redesign a project, not develop, or do so outside of the SFHA.

As such, no irreversible or irretrievable commitment of resources would occur as a result of Alternative 2 and Alternative 3. Irreversible or irretrievable commitment of resources associated with development implementing the alternatives would occur at the discretion of the developer.

4.20. Relationship Between Short-Term Uses and Long-Term Productivity

The alternatives do not involve authorizing, funding, undertaking, or encouraging development in the SFHA. As such, there would be no direct short-term use of the environment. Development is authorized by NFIP-participating communities and subsequently carried out locally by project proponents. However, indirect impacts could occur from continued development in the SFHA implementing the no net loss standards (i.e., the no net loss mitigation ratios, RBZ requirements, and reporting requirements).

Under both Alternative 2 and Alternative 3, indirect short-term uses of the environment would occur. Additional ground disturbance required to implement the no net loss standards and RBZ requirements (e.g., creating replacement flood storage, installing a water catchment and treatment basin, removing existing impervious surface, replacing trees) would result in the temporary disruption of soils and vegetation. However, in the long term, implementation of the no net loss standards would maintain flood storage, water quality, and vegetation in the SFHA. Maintaining these three floodplain functions would maintain, and could improve, the productivity of the floodplain (e.g., ability to hold floodwaters and maintain water discharge and pollutant loads) compared to the No Action Alternative.

Both Alternative 2 and Alternative 3 could influence some project proponents to develop outside of the SFHA to avoid the cost and complexity of implementing the no net loss standards. However, some development in the SFHA would continue based on a requirement or preferences to be located near waterways (e.g., infrastructure already within SFHA). As discussed in Section 4.2, the additional land needed to implement mitigation in the SFHA could reduce the total developable land in the SFHA, thereby leading to increased development pressures in UGBs. As such, while Alternative 2 and Alternative 3 would maintain, or could improve, the productivity of the SFHA compared to the No Action Alternative, the long-term productivity of land outside of the SFHA and within or near UGBs could be reduced.

Chapter 5. Agency and Tribal Coordination and Public Involvement

This Chapter documents the coordination activities that have occurred during the development of this Draft EIS.

5.1. Scoping Process and Comments

5.1.1. SCOPING PROCESS

FEMA initiated scoping under NEPA for this EIS in March 2023. The scoping period continued through June 2023. The NEPA scoping process invites public comment on the range of alternatives and the scope of the issues to be addressed in the EIS. Public involvement provides FEMA an opportunity to obtain information from the public, agencies, Tribes, and other stakeholders about the purpose and need for the action, the proposed alternatives, and potential impacts to be evaluated, promoting better decision making.

On March 6, 2023, FEMA published a notice of intent (NOI) in the Federal Register announcing their intent to prepare an EIS and to conduct in-person and virtual scoping meetings (88 Federal Register 13841). The NOI identified the process to provide written comments via the Federal Rulemaking Portal (https://www.regulations.gov, ID: FEMA-2023-0007) and explained that written and verbal comments would be accepted at the scoping meetings. To support the public engagement effort, FEMA established a plan-specific website at https://www.fema.gov/about/organization/region-10/oregon/nfip-esa-integration and updated the website throughout the scoping period. The website was identified in the NOI and included information about the in-person and virtual scoping meetings, key documents, maps, and copies of the slides used in the public meetings.

FEMA posted information about in-person and virtual scoping meetings as announcements on the FEMA website. The announcements included relevant attendance information, such as where to attend the in-person meetings and how to register for the virtual meetings. FEMA also announced each in-person scoping meeting in one local newspaper for each meeting. FEMA distributed information about the NOI through social media posts on FEMA Region 10's Twitter/X (five posts) and LinkedIn (six posts) sites, sent three advisories to 383 business and non-profit community leaders, 445 elected officials, and 11 tribal nations across Oregon, asked DLCD to notify floodplain managers across the state, and sent two email blasts to over 1,394 Oregon individuals and organizations subscribed to the STARR II Newsletter (a floodplain management e-newsletter). Many communities and individuals re-posted the notices on their own social media channels. FEMA also issued press releases on May 25, 2023, and June 21, 2023, to 864 media outlets and reporters in Oregon. In addition, eleven news stories were independently published and covered the scoping process.

Given the complexity of the proposed project, FEMA initially established a 60-day comment period (88 FR 13841) to run from March 6, 2023, to May 5, 2023. Following requests from three U.S. Congresspersons, FEMA held a second public comment period. This was initiated with a Federal Register notice (88 FR 33901) on May 25, 2023, which announced that comments would be accepted until June 26, 2023. In total, FEMA provided 92 days for public scoping for this EIS.

5.1.2. SCOPING MEETINGS

Over the three-month public scoping period, FEMA held seven in-person public meetings, five virtual public meetings, and 12 targeted audience virtual meetings.

5.1.2.1. In-Person and Virtual Meetings

FEMA held a total of seven in-person public meetings in Oregon and five virtual public meetings during the 92-day comment period. Table 5.1 provides the dates, times, locations, and number of attendees. A total of 167 people attended. The date, time, and location of in-person meetings were selected to reach a range of geographies across the plan area and a range of interested stakeholders.

Table 5.1. In-person Scoping Meeting Details

Date	Time (Pacific)	Location	Attendees
Wednesday April 5, 2023	5:30 – 8:00pm	Port of Tillamook Bay, Officer's Mess Hall, Tillamook	125
Thursday, April 6, 2023	5:30 – 7:30pm	Eugene Public Library Downtown	8
Wednesday, April 19, 2023	5:30 – 7:30pm	Vert Auditorium, Pendleton	9
Monday, June 12, 2023	5:00 – 7:00pm	Astoria Public Library, Flag Room	14
Tuesday, June 13, 2023	5:00 – 7:00pm	Oregon Coast Community College, Newport	4
Wednesday, June 14, 2023	6:30 – 8:30pm	Coos Bay Public Library	5
Thursday, June 15, 2023	5:00 – 7:00pm	Grants Pass High School Performing Arts Center	2

Table 5.2 provides the dates, times, and number of attendees for each virtual meeting. A total of 85 people attended the virtual meetings. Each public virtual meeting was held on the Zoom platform with a pre-registration process that provided connection information and a calendar reminder.

Table 5.2. Virtual Scoping Meeting Details

Date	Time (Pacific)	Attendees
Wednesday, March 22, 2023	4:00 – 6:00pm	13
Tuesday, April 18, 2023	4:00 – 6:00pm	29
Thursday, April 20, 2023	4:00 – 6:00pm	20

Date	Time (Pacific)	Attendees
Thursday, June 1, 2023	4:00 – 6:00pm	7
Wednesday, June 7, 2023	4:00 – 6:00pm	16

5.1.2.2. Targeted Meetings

In addition to the public meetings, FEMA hosted or participated in 12 virtual meetings with targeted stakeholder groups such as Tribes and elected officials. A total of 186 people attended the targeted meetings. **Table 5.3** provides the dates, times, audience, and number of attendees for each targeted meeting.

Table 5.3. Targeted Scoping Meeting Details

Date	Time (Pacific)	Audience	Attendees
Wednesday, March 1, 2023	10:00 AM	Oregon Floodplain Managers (FPM) and the Department of Land Conservation & Development (DLCD)	55
Thursday, April 13, 2023	11:00 AM	Tribes	1
Friday, April 14, 2023	10:00 AM	Business Sector	25
Friday, April 14, 2023	12 noon	Elected Officials	8
Friday, April 14, 2023	2:00 PM	Intergovernmental Agencies	4
Wednesday, April 26, 2023	3:00 PM	Tillamook Estuary Partnership	4
Tuesday, May 2, 2023	10:00 AM	Benton County Commissioners Public Meeting	n/a
Tuesday, May 2, 2023	1:30 PM	FBB Federal Relations (for Ports)	3
Wednesday, May 3, 2023	10:00 AM	State of Oregon (various departments)	22
Thursday, May 4, 2023	10:00 AM	Congresswoman Suzanne Bonamici and staff	4
Tuesday, May 23, 2023	12 noon	Congresswoman Chavez- DeRemer	1
Wednesday, June 7, 2023	2:00 PM	Elected Officials and Staff	59

5.1.3. SCOPING COMMENTS

During the scoping comment period, FEMA received approximately 100 comment letters and tabulated approximately 960 distinct comments from those letters. **Figure 5-1** shows the submitter's affiliation for each of the approximately 100 comment letters received. The majority of submissions were from local government, including cities and counties, individuals, and businesses/business groups.

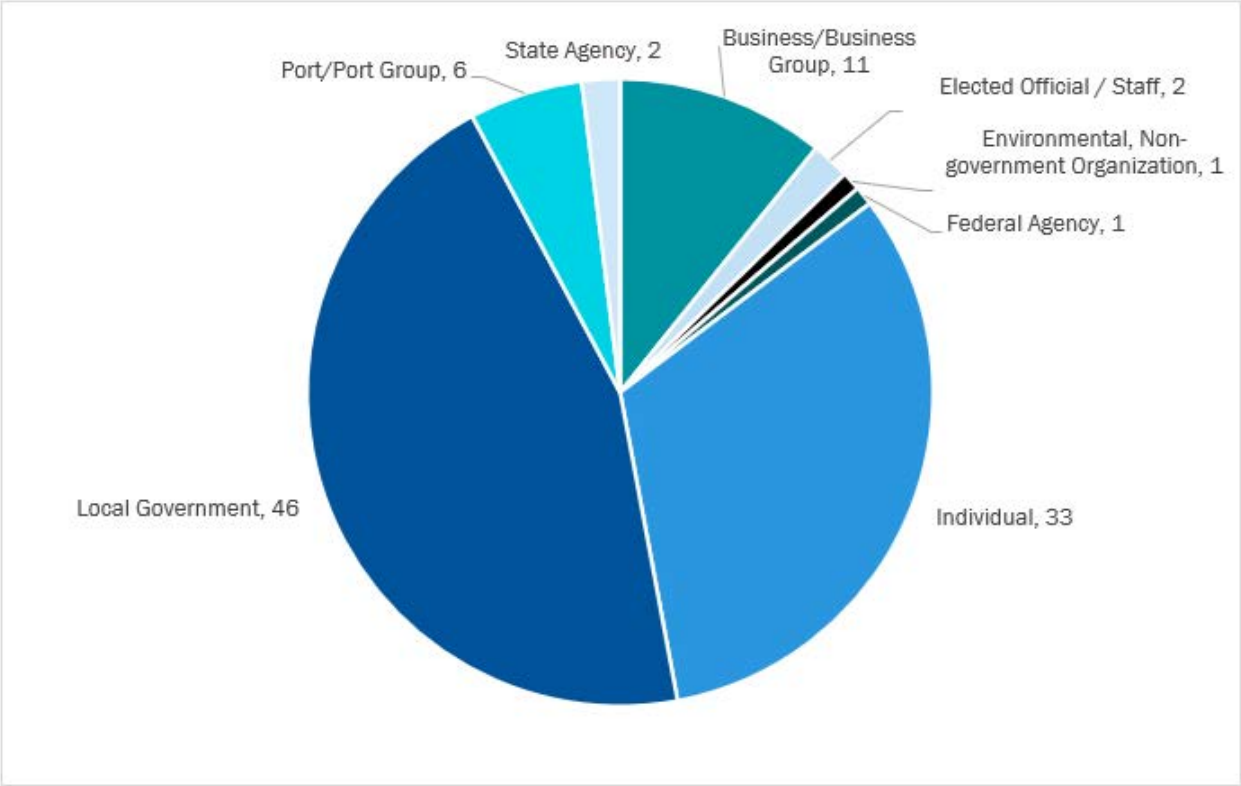

Figure 5-1. Comment Submitters Affiliation (102)

Stakeholders voiced a variety of concerns during the scoping comment period. FEMA considered the content of all comments received in determining the scope of the EIS. FEMA reviewed and grouped comments by resource area or EIS topic.

Figure 5-2 presents the number of comments by topic for topics with 10 or more comments. The top three topics were:

- The level of specificity provided for the proposed implementation plan.
- The proposed mitigation requirements and perceived obstacles to implementing those requirements.
- Community costs to implement the proposed requirements.

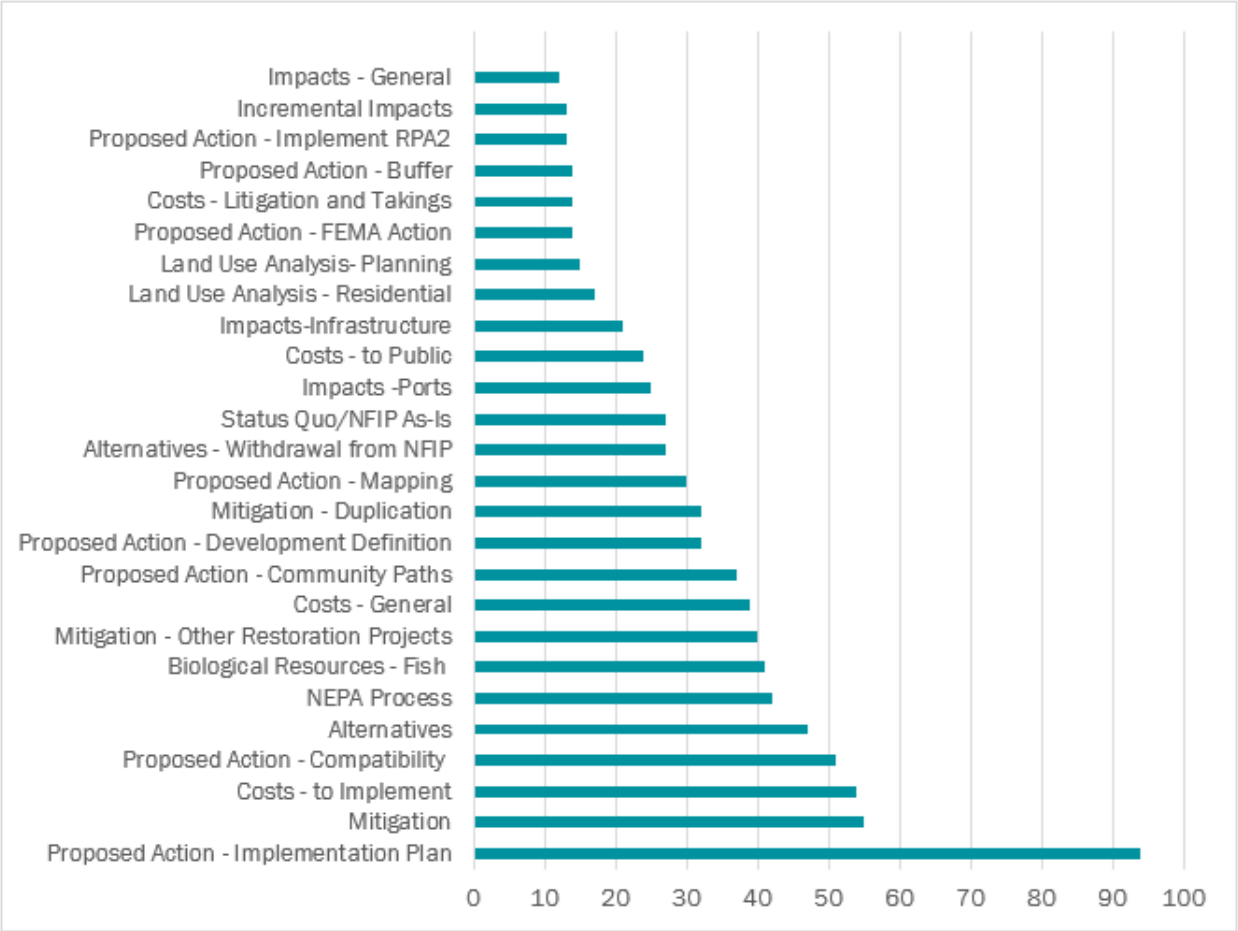

Figure 5-2. Number of Comments by Topic for Topics with 10 Comments or More

Table 5.4 identifies where each comment topic area was addressed in the EIS.

Table 5.4. Scoping Comments EIS Reference

Topic	EIS Reference
Impacts – General	Impacts for each alternative are analyzed in Chapter 4 of the EIS. Economic impacts are further evaluated in Appendix D. Water quality impacts are further detailed in Appendix G. Biological resource impacts are further analyzed in Appendix H. Floodplain impacts are described in detail in Appendix I.
Proposed Action – Implement RPA2	FEMA's analysis of the 2016 NMFS BiOp as an alternative is available in Section 3.5.2 of the EIS.
Proposed Action – Buffer	The RBZ is described in Section 3.3.1.4 of the EIS as well as in the 2024 Draft Implementation Plan (Appendix A).
Costs – Litigation and Takings	Economic impacts associated with the alternatives are summarized in Section 4.3 of the EIS and detailed in Appendix D. The regulatory background for this EIS is detailed in Chapter 1.

Topic	EIS Reference
Proposed Action – FEMA Action	FEMA's role under the NFIP is described in Chapter 1. FEMA's authority to implement the alternatives is described in Section 1.6.1 of the EIS and the 2024 Draft Implementation Plan (Appendix A).
Land Use – Planning	Land use planning is analyzed in Section 4.2 of the EIS.
Land Use – Residential	Residential land use is analyzed in Section 4.2 of the EIS. Economic impacts on residential land uses are analyzed in Section 4.3.
Impacts – Infrastructure	Impacts to infrastructure are analyzed in Chapter 4 of the EIS, including infrastructure related to hazardous materials (Section 4.14), transportation (Section 4.15), public and critical infrastructure (Section 4.16), and the economic impact that affects infrastructure (Section 4.3).
Costs – to Public	Economic impacts associated with the alternatives are summarized in Section 4.3 of the EIS and detailed in Appendix D.
Impacts – Ports	Economic impacts associated with the alternatives are summarized in Section 4.3 of the EIS and detailed in Appendix D.
Status Quo/NFIP As Is	The No Action Alternative is analyzed in Chapter 4 of the EIS.
Alternatives – Withdrawal from NFIP	The impacts of withdrawing from the NFIP are detailed in the Frequently Asked Questions (Appendix B).
Proposed Action – Mapping	NFIP mapping is described in Section 1.3.1. FEMA's evaluation of the 2016 NMFS BiOp alternative, including changes to mapping, is available in Section 3.5.2 of the EIS.
Mitigation – Duplication	Duplicative mitigation is analyzed through the differences between Alternative 2 and Alternative 3. The 2024 Draft Implementation Plan explains how developers can work with federal, state, and local regulatory agencies and the floodplain administrator to identify opportunities to provide for multiple mitigation requirements within the same site, if feasible, to reduce duplication and costs.
Proposed Action – Development Definition	Development is defined in 44 CFR 59.1. The relationship between the alternatives and development is described in Section 2.6 of the 2024 Draft Implementation Plan (Appendix A).
Proposed Action – Community Paths	The Community Paths for compliance are summarized in Section 3.3.2 of the EIS and Chapter 4 of the 2024 Draft Implementation Plan (Appendix A).
Costs – General	Economic impacts associated with the alternatives are summarized in Section 4.3 of the EIS and detailed in Appendix D.
Mitigation – Other Restoration Projects	The relationship between restoration projects and the alternatives are described in Section 3.3.3 of the EIS and Section 2.7 of the 2024 Draft Implementation Plan (Appendix A). The potential to utilize future restorations projects to achieve no net loss under Path C is summarized in Section 3.3.2.3 of the EIS, Section 4.4 of the 2024 Draft Implementation Plan (Appendix A), and the Path C – Customized Community Plan guidance (Attachment D of the 2024 Draft Implementation Plan [Appendix A]).
Biological Resources – Fish	Biological resources, including fish, are analyzed in Section 4.11 of the EIS and detailed in Appendix H.
NEPA Process	The NEPA process and purpose is summarized in Section 1.1.1 of the EIS. The alternatives development and screening process is detailed in Section 3.1 of the EIS. The agency and public involvement process is described in Chapter 5 of the EIS.
Alternatives	The alternatives are described in Chapter 3 of the EIS.

Topic	EIS Reference
Proposed Action – Compatibility	The compatibility of the alternatives with existing federal, state, and local regulations are analyzed by resource in Chapter 4 of the EIS.
Costs – to Implement	Economic impacts associated with the alternatives are summarized in Section 4.3 of the EIS and detailed in Appendix D.
Mitigation	Mitigation methods are described in Section 3.3.1 of the EIS and Chapter 3 of the 2024 Draft Implementation Plan (Appendix A).
Proposed Action – Implementation Plan	The 2024 Draft Implementation Plan is available in Appendix A.

5.1.3.1. Summary of Submitted Alternatives, Information, and Analyses

This section summarizes all alternatives, information, and analyses submitted by state, Tribal, and local governments, and other public commenters during the scoping process. This information was considered by the lead and cooperating agencies during the development of this EIS.

Alternatives Suggested

Of the 960 distinct comments received during the scoping comment period, 47 (4.9 percent) pertained to alternatives. The following alternatives were suggested by stakeholders during the scoping period. Additional information on the alternatives suggested during scoping and how FEMA considered them for this EIS is provided in Chapter 3.

1. Higher Restrictions (Section 3.5.3): This suggestion would include additional floodplain functions beyond flood storage, water quality, and riparian vegetation and/or allow for a more comprehensive, holistic evaluation of floodplain functions and species benefits. This could allow more site-specific flexibility in replacing floodplain functions to achieve no net loss. A similar suggestion recommended using the 10-year floodplain as a reasonable boundary within which to limit floodplain development.

2. State of Oregon's 5th Path (Section 3.5.4): This would be a proposed pathway for implementation in which Oregon would adopt state-level regulatory measures that would apply to development activities in the SFHA and would result in the achievement of no net loss of the three floodplain functions.

3. Nationwide Approach (Section 3.5.5): This suggestion would evaluate nationwide approaches to NFIP-ESA integration as compared to approaches that address Oregon specifically.

4. Restoration Projects Funded by FEMA or Other Entities (Section 3.5.6): Under this suggestion, FEMA would supplement the no net loss approach of the NFIP by using other FEMA program funds to purchase land and protect and/or restore floodplain functions in the SFHA. FEMA could identify areas in the SFHA that offer ESA protection and benefits and prioritize restoration in these areas. Similarly, communities could consider existing or new restoration projects as a method of achieving no net loss and/or reducing project-level mitigation ratios.

5. FEMA ESA Section 7(a)(1) Action (Appendix B): This suggestion would change FEMA's proposed ESA compliance approach consistent with ESA Section 7(a)(2) to cover the take of specific species and adverse modification of designated critical habitat to instead promote the conservation of endangered species consistent with ESA Section 7(a)(1).

Information and Analyses Submitted

Commentors identified existing studies and other sources of information for FEMA to consider during the development of this Draft EIS. The Columbia Pacific Economic Development District noted existing literature analyzing job loss, and social and economic impacts associated with environmental regulation. Three studies were provided with additional detail on the social and economic impacts of environmental regulations. These studies were reviewed and considered during the development of the economic analysis of this Draft EIS, as applicable.

The City of Portland provided additional references on salmon and habitat use in urban streams, a floodplain community vulnerability analysis, and a housing assessment for the City's floodplain management program updates. These references were reviewed and incorporated into the impact analyses of this Draft EIS, as applicable.

5.2. Agency Coordination

5.2.1. COOPERATING AGENCIES

FEMA worked with the cooperating agencies identified in **Table 5.5** throughout the development of this EIS. Cooperating agencies played an important role by providing information and technical expertise.

Table 5.5. Cooperating Agencies

Cooperating Agency
NMFS
USFWS
DLCD
Benton County
Tillamook County
Umatilla County
City of Portland

A memorandum of agreement (MOA), or letter in the case of NMFS and USFWS, was developed between FEMA and each cooperating agency to clarify the roles of responsibilities of each party in preparation for the EIS as well as to establish a framework for cooperation and coordination. As stipulated in these agreement documents, FEMA provided cooperating agencies with early

opportunities to review and comment on the content of the EIS prior to its publication. This included early review of this Draft EIS, technical reports, and guidance documents, as depicted in **Table 5.6**.

Table 5.6. Cooperating Agency Reviews

Document	Approximate Review Period
EIS Outline	October 2023
Chapter 5 of the EIS	December 2023
Chapter 1-3 of the EIS	May 2024
Model Ordinance (Attachment B of Appendix A)	May 2024
Path C Guidance (Attachment D of Appendix A)	August 2024
Water Quality Technical Report (Appendix G)	November 2024
Floodplain Technical Report (Appendix I)	November 2024
Economic Technical Report (Appendix D)	December 2024
Biological Resources Technical Report (Appendix H)	December 2024
2024 Draft Implementation Plan (Appendix A)	January 2025
Compiled Draft EIS	May 2025

FEMA held topic-specific meetings with cooperating agencies at their request.

In addition, FEMA held the following workshops with cooperating agencies:

- Technical Guidance Workshop: Held August 3, 2023, to discuss the type and content of technical guidance needed.
- EIS Outline Workshop: Held October 16, 2023, to discuss the outline of the EIS including organization, structure, and content.
- Model Ordinance Workshop: Held May 22, 2024, to discuss the preliminary draft of the Path A – Model Ordinance.

Cooperating agencies were also invited to FEMA's quarterly office hour meetings, discussed further in the following section.

5.2.2. INVOLVEMENT OF LOCAL GOVERNMENTS

Elected officials and their staff were provided the opportunity to be involved through quarterly newsletter updates and quarterly office hour meetings. The quarterly office hour meetings discussed the content of the newsletters and provided elected officials and their representatives, including local government officials and staff, and cooperating agencies the opportunity to ask questions.

Table 5.7 lists the newsletters sent while **Table 5.8** provides the dates of and participation in office hour meetings. The newsletters were made available on FEMA's website.[55]

Table 5.7. Newsletters

Newsletter Content	Month Distributed
Schedule Update, Previous Quarter Accomplishments, Next Quarter Plan	June 2023
Schedule Update, Previous Accomplishments, Outreach Efforts, Scoping Summary	September 2023
Cooperating Agencies, Stakeholder Engagement Interviews and Takeaways, Next Steps	December 2023
Cooperating Agency Review, Development of Alternatives, Directions for Determining if a Location is in the Plan Area, Public, Agency, and Tribal Engagement, Implementation Plan Paths, Next Steps	March 2024
Cooperating Agency Review, Technical Reports, NEPA Engagement Plan, Next Steps	June 2024
Cooperating Agency Review and Riparian Buffer Zone	September 2024
Technical Reports and Cooperating Agency Review and Next Steps	December 2024

Table 5.8. Office Hour Meetings

Date of Office Hour Meeting	Participation
June 7, 2023	59 registrants
September 14, 2023	39 registrants; 20 attendees; 6 participants spoke
December 11, 2023	23 registrants; 11 attendees; 4 participants spoke
March 24, 2024	24 registrants; 12 attendees; 7 participants spoke or engaged via the chat function
July 19, 2024	15 registrants; 7 attendees; 5 participants spoke or engaged via the chat function
October 23, 2024	25 registrants; 11 attendees; 4 participants spoke or engaged via the chat function
January 14, 2025	21 registrants; 19 attendees; 7 participants spoke

[55] https://www.fema.gov/about/organization/region-10/oregon/nfip-esa-integration

5.3. Tribal Coordination

FEMA Region 10 consulted with Tribal governments to support the implementation efforts of NFIP-ESA integration and FEMA's NEPA review. NEPA encourages federal agencies to cooperate with Tribes and recognize the special expertise that Tribes have regarding the affected environment and potential environmental consequences of our federal actions.

In addition to the targeted scoping meeting for Tribes (April 13, 2023, **Table 5.3**), FEMA sent letters from the Region 10 Regional Administrator to all federally recognized Tribes in the plan area on December 21, 2023, which included the following Tribes.

- Burns Paiute Tribe
- Confederated Tribes Coos, Lower Umpqua Siuslaw Indians
- Confederated Tribes of Grand Ronde Community of Oregon
- Confederated Tribes of Siletz Indians of Oregon
- Confederated Tribes of the Umatilla Indian Reservation (CTUIR)
- Confederated Tribes of the Warm Springs Reservation of Oregon
- Coquille Indian Tribe
- Cow Creek Band of Umpqua Tribe of Indians
- Klamath Tribes

CTUIR responded via letter on April 25, 2024, requesting in-person consultation in the summer or fall of 2024. FEMA staff met with CTUIR at the Nixyaawii Governance Center on July 26, 2024, and followed up with a letter from FEMA Region 10 Regional Administrator Willie Nunn to Chairman Gary Burke on August 26, 2024.

FEMA Region 10 hosted a 2024 Tribal Gathering from May 7-9, 2024. Over 180 Tribal representatives participated from throughout Region 10.

During the July 26, 2024, consultation, FEMA presented an overview of the following:

- The National Flood Insurance Program
- The Oregon Biological Opinion
- FEMA's Implementation Plan for NFIP-Endangered Species Integration in Oregon
- The Plan's National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) review process

Consideration of the proposed changes in implementation of the NFIP throughout the Oregon plan area include the potential for benefits to salmon and steelhead recovery, which is important to many Tribal nations. FEMA values Tribal knowledge and expertise in protecting fish and other natural

resources and has conducted Tribal outreach to seek input on how the proposed NFIP changes might impact Tribes.

The proposed implementation of the no net loss standards may affect NFIP participating communities that are within an area that corresponds to the six National Oceanic and Atmospheric Administration Salmon and Steelhead Recovery Domains and EFH in the State of Oregon. Therefore, proposed changes may be of interest to Tribal Nations regardless of Tribal participation status in the NFIP.

During the July 26, 2024, consultation, CTUIR staff offered to assist FEMA with the Tribal Treaty Rights section (Section 4.13). FEMA appreciates the Tribe's comments on this section.

5.4. Public Participation Process on Draft EIS

5.4.1. NOTIFICATION TO THE PUBLIC

FEMA will notify the public of the availability of this Draft EIS for review and comment via:

- A Notice of Availability (NOA) will be published in the federal register.
- Emails will be sent to stakeholders, cooperating agencies, NFIP participating communities, and quarterly newsletter registrants.
- An announcement will be made on the project website: https://www.fema.gov/about/organization/region-10/oregon/nfip-esa-integration.
- Press releases will be sent to area news outlets.
- Social media.

FEMA worked with cooperating agencies to identify key contacts from potentially interested or affected parties and to develop a stakeholder list.

5.4.2. PRELIMINARY EDUCATIONAL OUTREACH

FEMA will engage with key audiences including floodplain managers and potentially interested and affected parties prior to the publication of this Draft EIS. Preliminary outreach will include information on the NFIP and its requirements, components of the Oregon NFIP-ESA integration, the environmental review process, and details regarding the upcoming comment period on this Draft EIS. FEMA will work with the cooperating agencies to provide briefings with elected officials in participating NFIP communities.

5.4.3. PUBLIC MEETINGS AND VIRTUAL OPEN HOUSE

FEMA will hold virtual public meetings, which will include a presentation on this Draft EIS. The presentation will inform participants of the overall NEPA process and the findings of this Draft EIS. Following the presentation, there will be an opportunity for participants to ask questions and provide

feedback. A court reporter will be present and capture comments from meeting attendees. FEMA will encourage the potentially interested and affected parties to submit comments in writing on the Draft EIS. Meetings will be scheduled for different times of day (morning, afternoon, and evening) to allow for broad participation. Participants will also be provided a link to a virtual open house platform that will contain informational materials available at the in-person meetings.

The virtual open house is an online meeting room that people can visit to learn more about this Draft EIS and the proposed alternatives. The virtual open house will be open for the duration of the public comment period on this Draft EIS and will include all materials available at the in-person meetings and additional materials as identified. As people enter the virtual room, they will be able to provide contact information if they would like to be notified of future opportunities to participate in the process. The virtual room will include opportunities to provide written comments.

Chapter 6. List of Preparers

The following is a list of preparers who contributed to the development of this Draft EIS. The individuals listed below had principal roles in the preparation of this document. Many others contributed, including senior managers, administrative support personnel, and technical staff, and their efforts in developing this Draft EIS are appreciated.

Federal Emergency Management Agency

Reviewers	Expertise and Experience	Role in Preparation
Ross, Portia	FEMA Environmental Officer	Review and Approval
Adler, Elliott	Attorney; 6 years of experience	Reviewer
Bezek, Robert	Floodplain, Local Government, Water Management; 30 years of experience	Reviewer
Cooper, Erin	Floodplain Management; 10 years of experience	Reviewer, Project Manager, Floodplain and Biological impacts
Graves, John	Floodplain Management and Insurance Branch Chief; 20 years of experience, Certified Floodplain Management (CFM)	Reviewer, Alternatives Analysis
Horwitz, Jennifer	Environmental Planner and NEPA Specialist; 20 years of experience	Reviewer, Project Manager
Hyatt, Larissa	NEPA Specialist; 11 years of experience	Reviewer
Kachra, Galeeb	Environmental Planner and NEPA Specialist; 15 years of experience	Reviewer, Project Manager
Kilner, Science	Regional Environmental Officer; 25 years of experience	Reviewer, Branch Chief
Reale-Pilkenton, Roxanne	Floodplain Management; 20 years of experience, CFM	Reviewer, Floodplain and economic impacts

CDM Smith

Preparers	Experience and Expertise	Role in Preparation
Argiroff, Emma	Environmental Planner; 7 years of experience	Document Management, Technical Reviews
Gilbride, Jeremy	Environmental Engineer; 10 years of experience	Air Quality Analysis
Gleason, Questa	Environmental Planner; 2 years of experience	Transportation Analysis
Griffin, Stuart	Environmental Scientist; 15 years of experience	Biological Resources Technical Report

Preparers	Experience and Expertise	Role in Preparation
Gruber, Elias	Civil Engineer; 13 years of experience	Floodplain Technical Report
January, Pei Yin	Civil Engineer; 20 years of experience	Floodplain Technical Report
Johnson, Theodore	Water Resources Engineer; 44 years of experience	Biological Resources Technical Report
Jones, Emma	Environmental Scientist; 5 years of experience	Biological Resources Technical Report
Jones, Jennifer	Biologist; 20 years of experience	Biological Resources Analysis
Khalaf, Adam	Biologist; 10 years of experience	Biological Resources Analysis
Lea, Claudia	Water Resources Engineer; 20 years of experience	Quality Control/Technical Reviewer
McLaughlin, Aislinn	Environmental Scientist; 3 years of experience	Implementation Guidance
Migliore, Philip	Civil Engineer; 3 years of experience	Geographic Information Specialist/Cost Estimates
Molnar, Daniel	Geographic Information Specialist; 15 years of experience	Data Analysis
Nelson, Tracy	Architectural Historian; 25 years of experience	Cultural Resources Analysis
Park, Chris	Senior Planner; 19 years of experience	Quality Control
Paul, Abigail	Environmental Engineer; 5 years of experience	Community Data Analysis
Perron, Nichole	Planner; 5 years of experience	Hazardous Materials Analysis
Quan, Jenna	Biologist; 3 years of experience	Biological Resources Technical Report
San Miguel, Robin	Environmental Scientist; 5 years of experience	Water Quality Technical Report
Shepherd, Brian	Environmental Planner; 5 years of experience	Data Analysis
Sobel, David	Economics Specialist; 12 years of experience	Technical Reviewer for Economics Technical Report
Stenberg, Kate PhD	Senior Biologist, Senior Planner; 40 years of experience	Quality Control/Technical Reviewer
Subbio, Tony, CEM, CFM, PMP	Emergency Management Discipline Leader and Floodplain Management Subject Matter Expert; 21 years of experience	Floodplain Technical Report
Tischler, Monica	Environmental Scientist; 25 years of experience	Biological Resources Technical Report

Preparers	Experience and Expertise	Role in Preparation
Tran, Daniel	Environmental Scientist; 8 years of experience	Biological Resources Technical Report, Floodplain Technical Report
Weddle, Annamarie	Environmental Planner; 6 years of experience	Draft EIS and Implementation Guidance, Document Management
Woodruff, Abbie	Environmental Planner; 8 years of experience	Path C Guidance Documentation
Zingarelli, Richard	Floodplain Manager; 45 years of experience	Subject Matter Expert

Harvey Economics

Preparers	Expertise and Experience	Role in Preparation
Dornfeld, Cae	Research Associate; 7 years of experience	Economics Technical Report
Harvey, Ed – Principal	Principal Economist; 51 years of experience	Economics Technical Report
Walker, Susan – Director	Senior Economist; 22 years of experience	Economics Technical Report

WSP

Preparers	Expertise and Experience	Role in Preparation
Schnitzlein, Joshua	Floodplain Manager; 10 years of experience	Floodplain Technical Report

Chapter 7. References

This is a list of references used in this Draft EIS chapters. For references used in technical reports appended to this document, refer to the references chapter in the respective technical report appendix.

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