APPENDIX A

MODEL ORDINANCE

Appendix to FEMA'S February 22, 2018 Draft Community Implementation Strategy for the Interim Measures of the April 14, 2016 NMFS Biological Opinion for Oregon

FEMA

Note from DLCD:

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

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From an initial review of this draft model ordinance, it is disappointing that it does not reflect the recommendations generated earlier in the process through the workgroups, or the state recommendations sent to FEMA in October 2017. The draft also implies that local governments are obligated to adopt standards described in the Reasonable and Prudent Alternative (RPA). Since the BiOp and RPA do not create new federal standards, this implication is troubling.

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

The Model Ordinance

This Model Ordinance has been developed to address the requirements outlined in the April 2016 Biological Opinion on NFIP Implementation in Oregon, by incorporating consideration of the natural, as well as the built, environment in floodplain development. The regulatory language contained within can be adopted verbatim and incorporated into local floodplain and land use regulations. This Model Ordinance was prepared with advice and assistance from local and state officials, engineers, natural resources scientists, and planners to satisfy RPA Element 2: Interim Measures.

The Ordinance provides a set of provisions to protect the built environment from flooding and to minimize potential impacts of construction and reconstruction on public health and safety, property, water quality, and aquatic and riparian habitats. The requirements pertain to new development in the floodplains, which includes the maintenance, repair, or remodel of existing structures and utilities when the existing footprint is expanded and/or the floodplain is further encroached upon. "Development" is defined as "any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, filling, grading, paving, excavation or drilling operations or storage of equipment or materials" (44 CFR Part 59.1).

The Model Ordinance has four types of provisions, which are noted in the commentary column to the right of the model language:

1. The requirements of the National Flood Insurance Program, as specified in 44 CFR parts 59 and 60. NFIP requirements are noted with the CFR reference in the commentary.
2. Oregon State codes to protect structures from flood damage are specified in Oregon Structural Specialty code OSSC, Section 1612 and Oregon Residential Specialty CodeORSC, Section R322.

3. Some provisions are needed to meet the requirements of the Biological Opinion and Reasonable and Prudent Alternative issued by NMFS. <u>These provisions are noted in the commentary as "RPA requirement" with a reference to the relevant section in the Biological Opinion.</u>

4. Some provisions are strongly recommended because they go beyond protecting buildings from the one percent chance flood as mapped by FEMA. Higher regulatory standards are needed where the hazard is greater and to protect public safety, public health, the properties of others, water quality, and habitat.

Most of the voluntary provisions are eligible for credit under the Community Rating System (CRS). The CRS icon identifies which provisions exceed the minimum requirements of the NFIP and can receive CRS credit. The CRS is explained further in *CRS Credit for Habitat Protection*, 2018) and the *2017 CRS Coordinators' Manual*

(www.fema.gov/media-library-data/1493905477815-d794671adeed5beab6a6304d8ba0b207/633300_2017_CRS_Coordinators_Manual_508.pdf).

Organization

This Model Ordinance serves to guide the design and construction of development within the SFHA in consideration of ESA-listed species and their critical habitat. This ordinance is organized in the following manner:

- Section 1: Legal provisions for all regulatory programs, including this ordinance
- Section 2: Definitions of the technical terms found herein
- Section 3: Identification of the Special Flood Hazard Area and the data needs for the flood and habitat protection requirements
- Section 4: Procedures for permits and record keeping
- Section 5: General development standards that apply to all new development in the Special Flood Hazard Area
- Section 6: Standards to protect structures from flood damage
- Section 7: Habitat protection criteria

It is recommended that communities:

- Send their draft ordinance to both FEMA Region 10 and the Oregon Department of Land Conservation and Development prior to adoption to ensure that it meets federal and state requirements;
- Keep this Model Ordinance document after the ordinance is adopted, as the Commentary may prove helpful; and
- Participate in training programs to become more familiar with the floodplain and habitat protection regulations presented herein, and to improve local review capability.

MODEL ORDINANCE

An Ordinance to Manage Floodplain Development to Protect People, Property, and Habitat

ORDINANCE LANGUAGE	COMMENTARY
Section 1. General	The language of this ordinance can be modified unless noted in the commentary as an NFIP requirement (e.g. "44 CFR…"), an RPA requirement (RPA requirement…."), or a requirement of the Oregon state code (OSSC… or ORSC…).
1.1. Statutory Authorization The State of Oregon has delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety and general welfare of its citizenry. Therefore, the *(community name)* does ordain as follows:	Almost all Oregon cities and some Oregon counties will derive their authority to adopt an ordinance such as this from the home rule provisions of the Oregon Constitution. See Article XI, Section 2 of the Oregon Constitution and your local government charter, if applicable. All counties, including those without home rule charters, have been granted authority to enact ordinances under Oregon Revised Statute 203.035.
1.2. Findings of Fact A. Areas of *(community name)* are subject to periodic inundation and channel migration, which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief from flooding and channel migration, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare. B. Watersheds encompass surface water, ground water, floodplains, wetlands and other	

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features. When lands in watersheds are developed without taking appropriate care and precautions to avoid or minimize the generation of stormwater runoff, flood heights, frequencies, and velocities increase, which in turn causes a greater threat to humans, damage to property, destruction of natural floodplain functions, and adverse impacts to water quality and habitat. C. Surface water bodies, such as rivers, streams, lakes, estuarine, and marine areas and their floodplains often serve as aquatic and riparian habitats and provide for conveyance of flood waters. If these aquatic systems are not viewed and managed holistically as interconnected and inter-dependent biological and geomorphologic units, serious degradation of habitat and increased flood hazards to people and the built environment can result. D. Flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards, which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated, or otherwise protected from flood damage also contribute to flood losses. E. The *(community name)* has the primary responsibility for planning, adoption, and enforcement of land use regulations to accomplish proper management that reduces impacts on people, property, wildlife, and the natural environments of special flood hazard areas. **1.3. Purpose** The purpose of this ordinance is to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas by implementing provisions designed to:	

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A. Protect human life, health, and property; B. Minimize expenditure of public money for costly flood damage repair and flood control projects; C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public; D. Minimize prolonged business interruptions; E. Minimize damage to public facilities and utilities, such as water and gas mains, electric, telephone and sewer lines, streets, transit, and bridges, that are located in the SFHA; F. Help maintain a stable tax base by providing for the sound use and development of the SFHA so as to minimize future flood blight areas; G. Encourage notification to potential buyers that property is in the SFHA; H. Encourage that those who occupy areas subject to flooding and channel migration assume responsibility for their actions; I. Qualify the *(community name)* for participation in the National Flood Insurance Program, thereby giving citizens and businesses the opportunity to purchase federally-backed flood insurance; J. Achieve a no net loss or a net beneficial gain of natural and beneficial floodplain functions by: 1. Preserving natural flood storage, stormwater conveyance, erosion control, and groundwater recharge/soil infiltration processes that protect, create, and maintain habitat for threatened and endangered species;	

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2. Maintaining or improving the water quality of rivers, streams, lakes, estuaries and marine areas and their floodplains, to protect public water supplies, areas of the Public Trust, and wildlife habitat protected by the Endangered Species Act; and 3. Preventing or mitigating the loss of hydraulic, geomorphic and ecological functions of floodplains and stream channels.	
1.4. Lands to Which This Ordinance Applies This ordinance shall apply to lands within the Special Flood Hazard Area within the jurisdiction of *(community name)*, as defined in Section 3. Nothing in this ordinance is intended to allow uses or structures that are otherwise prohibited by the local zoning ordinance or State of Oregon Specialty Codes.	
1.5. Penalties for Noncompliance No development shall be undertaken or placed in the areas regulated by this ordinance without full compliance with the terms of this ordinance and other applicable regulations of *(community name)*. Violations of the provisions of this ordinance by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions), shall constitute a misdemeanor. Any person who violates this ordinance or fails to comply with any of its requirements shall upon conviction thereof be fined not more than *(amount)*, or imprisoned for not more than *(number)* days, or both, for each violation, and in addition, shall pay all costs and expenses involved in the case. Nothing herein contained shall prevent the *(community name)* from taking such other lawful action as is necessary to prevent or remedy any violation.	The community should review this and the following sections and ensure that they are consistent with similar provisions in the building code and zoning ordinance. This section may be omitted if the community already has a penalty provision that applies to these regulations.  CRS credit can be awarded where floodplain management regulations are extended beyond the SFHA shown on the FIRM under Section 411.a.

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1.6. Interpretations In the interpretation and application of this ordinance, all provisions shall be: A. Considered as minimum requirements; B. Liberally construed in favor of the governing body; and C. Deemed neither to limit or repeal any other powers granted under state statutes. **1.7. Abrogation and Greater Restrictions** This ordinance is not intended to repeal, abrogate or impair any existing easements, covenants, deed restrictions, codes, or ordinances. However, where this ordinance and another code, ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail. **1.8. Warning and Disclaimer of Liability** The degree of protection to the built and natural environment required by this ordinance is based on scientific, planning, and engineering considerations. Larger floods and movements of channels outside of mapped channel migration areas can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the SFHA or uses within such areas will be free from flood or erosion damage. This ordinance shall not create liability on the part of *(community name)*, any officer or employee thereof, or FEMA for any damage to property or habitat that results from reliance on this ordinance or any administrative decision lawfully made hereunder. **1.9. Severability** The provisions and sections of this ordinance shall be deemed separable and the invalidity of any portion of this ordinance shall not affect the validity of the remainder.	

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Section 2. Definitions Unless specifically defined below, terms or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance it's most reasonable application.	The definitions in this section are taken from 44 CFR § 59.1, unless otherwise stated.
Adverse effect/Likely to Adversely affect: Effects that are a direct or indirect result of the proposed action or its interrelated or interdependent actions and the effect is not: discountable, insignificant or beneficial. Discountable effects are those extremely unlikely to occur. Insignificant effects relate to the size of the impact and should never reach the scale where a take occurs. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. Beneficial effects are contemporaneous positive effects without any adverse effects. In the event that the overall effect of the proposed action is beneficial, but it is also likely to cause some adverse effects, then the proposed action is considered to result in a "likely to adversely affect" or "adverse effect" determination.	Definition from USFWS and NMFS, *Consultation Handbook: Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act,* March 1998. The term "take" is discussed further in the Handbook.
Appeal: A request for a review of the interpretation of any provision of this ordinance or a request for a variance.	
Area of Future Conditions Flood Hazard (AFCFH): The land area that would be inundated by the one-percent-annual-chance (100-year) flood based on future-conditions hydrology, inclusive of changes due to climate change.	Definition from Section 2.8.3 of the Biological Opinion.
Area of Shallow Flooding: The area designated as AO, AH, AR/AO, AR/AH or VO Zone on a community's Flood Insurance Rate Map. The area with a one percent or greater annual chance of flooding to an average depth of one to three feet, where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.	44 CFR 59.1

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Base Flood: The flood having a one percent chance of being equaled or exceeded in any given year (also referred to as the "100-year flood").	44 CFR 59.1
Base Flood Elevation (BFE): The water surface elevation of the base flood in relation to a specified datum. The BFE is depicted on the Flood Insurance Rate Map to the nearest foot and in the Flood Insurance Study to the nearest 0.1 foot.	
Basement: Any area of the building having its floor subgrade (below ground level) on all sides.	44 CFR 59.1
Below-grade Crawlspace: An enclosed area below the base flood elevation in which the interior grade is not more than two feet below the lowest adjacent exterior grade and the height, measured from the interior grade of the crawlspace to the top of the crawlspace foundation, does not exceed four feet at any point.	Note that a below-grade crawlspace floor may be considered a basement floor. See FEMA Technical Bulletin 11-01, *Crawlspace Construction for Buildings Located in Special Flood Hazard Areas, National Flood Insurance Program Interim Guidance, November, 2001*.
Breakaway Wall: A wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces (abnormally high tides or wave action), without causing damage to the elevated portion of the building or supporting foundation system.	44 CFR 59.1
Channel Migration Zone (CMZ): The area where a stream or river is susceptible to channel erosion. The CMZ may extend beyond the 100-year floodplain. Where the delineated CMZ extends beyond artificial revetments, bulkheads and levees, all such areas are included within the CMZ unless they are designated as disconnected migration areas, as these structures have a risk of failure.	**RPA Requirement.** Definition from Section 2.8.3 of the RPA.
Cluster Development/Open Space Zoning: An alternative site planning technique that concentrates dwelling units in a compact area to reserve undeveloped space elsewhere on the site. In this technique, lot sizes, setbacks and frontage distances are minimized to allow for open space. The basic	Definition from Section 2.8.3 of the RPA.

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principle of cluster development is to group new homes onto part of the development, so that the remainder can be preserved as unbuilt open space.	
Coastal High Hazard Area: An area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. The area is designated on the Flood Insurance Rate Map as Zone V1-V30, VE or V.	44 CFR 59.1
Critical Facility: A structure or other improvement that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired . Critical facilities include health and safety facilities, utilities, government facilities, and hazardous materials facilities. For the purposes of a local regulation, a community may also use the International Codes' definition for Category III and IV buildings.	 CRS credit is provided for setting higher protection standards for critical facilities.
Critical Feature: An integral and readily identifiable part of a flood protection system, without which the flood protection provided by the entire system would be compromised.	44 CFR 59.1
Development: 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 (i.e. lumber yards, junk yards, vehicle storage yards, gravel storage, road repair material staging, rip-rap material staging, etc.).	44 CFR 59.1
"Development" also includes removal of vegetation, other alteration of natural site characteristics (including any remnant natural characteristics existing in a degraded site), substantial repairs and improvements, and the maintenance, repair, or remodel of existing buildings, facilities, and utilities when their existing footprint is expanded.	Definition from Section 2.8.3 of the RPA, and *Clarification and Errata to the Reasonable and Prudent Alternative issued with the Biological Opinion for*

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	the National Flood Insurance Program in Oregon, January 24, 2017.
"Development" does not include the maintenance, repair, or remodel of existing buildings, facilities, and utilities within their existing footprints (except for substantial repairs and improvements); resurfacing of roads; lawn care; gardening; removal of noxious weeds; replacement of non-native vegetation with native vegetation; removal of hazard trees; forest and agricultural practices that do not involve filling, grading, or construction of levees or structures.	Expanding upon the definition of "development" per the NMFS definition (this paragraph and the preceding paragraph) is optional.
E Zone: The area comprised of special flood-related erosion hazards. The entire SFHA may be considered an E Zone.	
Elevated Building: A non-basement building, which has its lowest floor raised above ground level by foundation walls, shear walls, posts, piers, pilings, or columns.	Definition per Element 3.B of the RPA.
Elevation Certificate: the official form (FEMA Form 81-31) used to provide elevation information necessary to ensure compliance with provisions of this ordinance and determine the proper flood insurance premium rate.	Optional language to help residents obtain flood insurance and facilitate Community Rating System credit.
Encroachment: Activities or construction within the floodway including fill, new construction, substantial improvements, and other development. These activities are prohibited within the regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses that the proposed activity would not result in any increase in flood levels.	Definition from 44 CFR § 60.3(d)(3).
Erosion: The process of the gradual wearing away of land masses.	
Federal Emergency Management Agency (FEMA): The agency responsible for administering the National Flood Insurance Program.	44 CFR 59.1
Flood or Flooding: A general and temporary condition of partial or complete inundation of 2 or more acres of normally dry land area or of 2 or more	

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properties (at least 1 of which is the policy holders property) from : 1. The overflow of inland or tidal waters; and/or 2. The unusual and rapid accumulation of runoff of surface waters from any source; or 3. Mudflow: or 4. Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.	44 CFR 59.1
Flood Boundary and Floodway Map: The official map on which the Federal Emergency Management Agency or Federal Insurance Administration has delineated both the areas of flood hazard and the floodway.	44 CFR 59.1
Flood Elevation Study: means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards.	44 CFR 59.1
Flood Insurance Rate Map (FIRM): The official map on which FEMA has delineated both the special flood hazard areas and the risk premium zones applicable to the community.	44 CFR 59.1
Flood Insurance Study: See "Flood Elevation Study".	44 CFR 59.1
Floodplain or Floodprone Area: Means any land area susceptible to being inundated by water from any source. (see definitions of "Flooding")	
Floodplain Management: The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to	44 CFR 59.1

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emergency preparedness plans, flood control works, and floodplain management regulations.	
Floodplain Management Regulations: Zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a floodplain ordinance, grading ordinance, and/or erosion control ordinance), and other applications of a police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.	44 CFR 59.1
Floodproofing: Any combination of structural and non-structural additions, changes, or adjustments to structures, which reduce or eliminate flood damage to real estate or improved real property. water and sanitary facilities, structures and their contents	44 CFR 59.1
Floodway: The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (also called Regulatory Floodway).	 See page 3-17 in Floodplain Management Requirements, FEMA 480, for more information on floodway mapping. The NFIP minimum standard is a one foot allowable surcharge, but the community may opt for a more restrictive standard. CRS credit is provided if a floodway is mapped based on a water surface elevation increase of less than one foot under Section 411.d. Some communities base their floodway delineation on flood depths, flood velocities, and/or channel migration zones.
Freeboard: A factor of safety usually expressed in feet above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood elevations greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.	 CRS credit is provided for freeboard under Section 431.a.

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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 only 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 or related manufacturing facilities. Also called Water-Dependent Use.	Definition for Water-Dependent Use from Section 2.8.3 from the Biological Opinion.
Future-Conditions Hydrology: The flood discharges associated with projected land use conditions based on a community's zoning maps and/or comprehensive land use plans, and without consideration of projected future construction of flood detention structures or projected future hydraulic modifications with a stream or other waterway, such as bridge and culvert construction, fill and excavation. Also includes projected changes in future riverine hydrology associated with climate change and changes in sea level, storm surge and wave heights due to climate change as of 2100.	Definition from Section 2.8.3 from the Biological Opinion .
Green Infrastructure: Use of natural hydrologic features to manage water and provide environmental and community benefits. Green infrastructure uses management approaches and technologies that utilize, enhance, and/or mimic the natural hydrologic cycle processes of infiltration, evapotranspiration, and reuse. At a large scale, it is an "interconnected network of green space that conserves natural systems and provides assorted benefits to human populations." At a local scale, it manages stormwater by infiltrating it into the ground where it is generated using vegetation or porous surfaces, or by capturing it for later reuse.	Definition from Section 2.8.3 from the Biological Opinion .
Habitat Restoration Activities: Those actions that reestablish or improve natural conditions and functions of aquatic and floodplain areas, including, but not limited to, side channels, oxbows, and adjacent wetlands. Restoration does not include those activities that have a primary purpose of providing or repairing flood or erosion protection structures, even when those activities include habitat enhancement features.	Definition from Section 2.8.3 from the Biological Opinion.

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Historic Structure: Any structure that is: 1. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register; 2. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district; 3. Individually listed in the Oregon Inventory of Historic Properties; or 4. Individually listed on a local inventory of historic places in communities with a historic preservation program that have been certified by the State Historic Preservation Officer or directly by the Secretary of the Interior.	44 CFR 59.1
High Hazard Area (HHA): The area comprised of and measured to the furthest landward extent of the floodway and E Zones.	Definition from Section 2.8.3 of the Biological Opinion and *Clarification and Errata to the Reasonable and Prudent Alternative issued with the Biological Opinion for the National Flood Insurance Program in Oregon,* January 24, 2017.
Impervious Surface: A surface that cannot be penetrated by water and thereby prevents infiltration and increases the amount and rate of surface water runoff, leading to erosion of stream banks, degradation of habitat, and increased sediment loads in streams. Such surfaces can accumulate large amounts of pollutants that are then "flushed" into local water bodies during storms and can also interfere with recharge of groundwater and the base flows to water bodies. Examples of common impervious surfaces include, but are not limited to,	**RPA Requirement (Biological Opinion Element 2).** Definition from the DLCD's *Water Quality Model Code and Guidebook*, October 2000.

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roads, rooftops, buildings, parking lots, driveways, sidewalks, and patios.	
Low Impact Development (LID): An approach to land development (or redevelopment) that works with nature to manage stormwater as close to its source as possible. It employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treats stormwater as a resource rather than a waste product. LID refers to designing and implementing practices that can be employed at the site level to control stormwater and strive to replicate the predevelopment hydrology of the site.	Definition from Section 2.8.3 from the Biological Opinion. Definition from Section 2.8.3 from the Biological Opinion. 44 CFR § 59.1 and ORSC R322.1.5
Low Intensity Recreational Use: Includes pedestrian trails, natural turf ball fields, tent camping, and temporary/transient structures such as campers or trailers.	44 CFR 59.1
Lowest Floor: The lowest floor of the lowest enclosed area (including basement or crawlspace). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area, is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this ordinance.	44 CFR 59.1
Manufactured Home: A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."	Definition from Section 2.8.3 from the Biological Opinion.
Manufactured Home Park or Subdivision: A parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.	
Mitigation: All steps necessary to minimize the potentially adverse effects of the proposed action and to restore and preserve the natural and beneficial floodplain values. It requires sequential	

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implementation of measures that first avoid effects to the degree possible, then minimize remaining effects, then replace and/or otherwise compensate for, offset, or rectify the residual adverse effects to natural floodplain functions.	Definition from Section 2.8.3 of the Biological Opinion.
Native Vegetation: Plant species that are indigenous to the region and that reasonably could be expected to naturally occur on the site.	
Natural Floodplain Functions: All natural floodplain functions that support fish and wildlife, including threatened and endangered species. All functions associated with the natural undisturbed floodplain that moderate flooding; retain flood waters; reduce erosion and sedimentation; mitigate the effect of waves and storm surges; maintain water quality and recharge of ground water; and provide fish and wildlife habitat. The term also includes large wood recruitment and other habitat forming processes.	 CRS credit for preserving open space is provided under Sections 421.a and 431LD.a.2(a). The credit under 421.a is based on the amount of floodplain area set aside. More points are provided if the preserved area is habitat for threatened or endangered species.
Open Space: Areas legally designated and encumbered as open space, but may also include other land use designations or zoning districts or overlays that restrict development and maintain areas in a condition that is largely devoid of structures or infrastructure regardless of ownership or access (private or public).	44 CFR 59.1
Principally Above Ground: At least 51 percent of the actual cash value of the structure, less land value, is above ground.	
Recreational Vehicle: A vehicle which is: 1. Built on a single chassis; 2. 400 square feet or less when measured at the largest horizontal projection; 3. Designed to be self-propelled or permanently	

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towable by a light duty truck; and 4. Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel or seasonal use.	.
Riparian Buffer Zone (RBZ): The outer boundary of the RBZ is measured from the ordinary high water line of a fresh waterbody (lake; pond; ephemeral, intermittent, or perennial stream) or mean higher-high water line of a marine shoreline or tidally influenced river reach to 170 feet horizontally on each side of the stream. The RBZ includes the area between these outer boundaries on each side of the stream, including the stream channel.	Definition from Section 2.8.3 from the Biological Opinion.
Riparian Vegetation: Native vegetation, especially trees, within 200 feet of the ordinary high water mark.	
Riverine: Relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.	
Special Flood Hazard Area (SFHA): The land in the floodplain subject to a one percent or greater chance of flooding in any given year. Designation on the FIRMs include the letters A or V.	44 CFR 59.1
Special Hazard Area: An area having special flood, mudslide, or flood-related erosion hazards. Also includes the AFCFH.	
Start of Construction: Includes substantial improvements and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement, or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such	

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as clearing, grading, and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or any other structural part of a building, whether or not that alteration affects the external dimensions of the building.	This ordinance sets protection standards for structures in Section 6. Other facilities, such as bridges, decks, and docks, are not subject to Section 6, but are still considered "development" and need floodplain development permits.
Structure: For floodplain management purposes, A walled and roofed building, including a gas or liquid storage tank, that is principally above ground as well as a manufactured home.	44 CFR 59.1
Substantial Damage: Damage of any origin sustained by a structure whereby the cost of restoring the structure to it's before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.	 Some communities count improvements cumulatively by inserting the word "cumulative" before "cost." They can receive CRS credit under Section 431.c. This is explained more in CRS Credit for Higher Regulatory Standards. 44 CFR 59.1
Substantial Improvement: Any , reconstruction, rehabilitation, addition or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of Construction" of the improvement. This term includes structures which have incurred "substantial Damage" regardless of the actual repair work performed. The term does not, however, include either: 1. Any project for improvement of a structure to correct existing violations of state or local health, sanitary or safety code specifications, which have been identified by the local code	

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enforcement official and that are the minimum necessary to assure safe living conditions; or 2. Any alteration of a historic structure listed on the National Register of Historic Places or the Oregon Inventory of Historic Properties. **Variance:** A grant of relief from the requirements of this ordinance which permits construction in a manner that would otherwise be prohibited by this ordinance. **Violation:** The failure of a structure or other development to be fully compliant with this ordinance. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in this ordinance is presumed to be in violation until such time as that documentation is provided. **Water-Dependent Uses:** See **Functionally-Dependent Uses**. For structures other than NFIP insurable buildings (e.g., utility crossings and bridges), the locational dependence is determined by two tests (Interagency Task Force on Floodplain Management, 1984). First, is the purpose of the activity involved directly in the business of inserting and extracting goods into and out of waterborne vessels or inserting and extracting the vehicles themselves to and from the water, or to provide public access and use of the shoreline for recreation? Second, for an industry classified as functionally-dependent under the first question, is an individual structure vital to day-to-day production?	Definition from Section 2.8.3 from the Biological Opinion.

ORDINANCE LANGUAGE	COMMENTARY
Section 3. Regulatory Data	
3.1. Area to be Regulated The area to be regulated is comprised of the Special Flood Hazard Area within the jurisdiction of *(community name)*.	 CRS credit is provided under Section 411.a where floodplain management regulations are extended beyond the SFHA shown on the FIRM and where new regulatory studies (see Section 3.6) exceed FEMA's mapping criteria.
3.2. Special Flood Hazard Area	**44 CFR §§ 60.3(c)(1) and (d)(2)**
A. The Special Flood Hazard Area is the area subject to flooding by the 100-year flood and is subject to the provisions of this ordinance. The SFHA is identified by FEMA in a scientific and engineering report entitled "Flood Insurance Study for *(community name)*," dated *(month, year)* with an accompanying Flood Insurance Rate Map (FIRM) for (*community name)* dated *(month, year)*, are hereby adopted by reference and declared to be a part of this ordinance. The Flood Insurance Study and the FIRM are on file at *(community address*).	The phrase "and any revisions thereto" is optional. The community should determine if it can be used to automatically adopt Letters of Map Change and other future revisions of the FIRM and Flood Insurance Study. If the phrase is not included, the ordinance may have to be amended every time the FIRM is revised or every time a Letter of Map Change is issued by FEMA.
B. Upon receipt of a floodplain development permit application, the *(floodplain administrator)* shall compare the elevation of the site to the Base Flood Elevation (BFE). The *(floodplain administrator)* shall inform the applicant that the project shall be subject to the flood insurance purchase requirements unless the owner receives a Letter of Map Amendment from FEMA.	A project in the SFHA but on a site that is above the BFE, must still meet the ESA requirements of the ordinance.
C. The *(floodplain administrator)* shall make interpretations where needed, as to the exact location of the boundaries of the SFHA (for example, where there appears to be a conflict between the mapped SFHA boundary and actual field conditions). The person contesting the location of the boundary shall be given a	

reasonable opportunity to appeal the interpretation as provided in Sections 4.8 and 4.9.

3.3 Flood Hazard Data

A. The BFE for the SFHA of *(community name)* shall be as determined from the 100-year flood profiles in the Flood Insurance Study for *(community name)*.

B. The BFE for each SFHA designated as AH or AO Zones shall be that elevation (or depth) designated on the FIRM. Where base flood depths are not available in Zone AO, the BFE shall be considered to be two feet above the highest natural grade adjacent to the structure.

44 CFR § 60.3(c)(7)

C. The BFE for all other SFHAs shall be as defined in Sections 3.3.F and 3.6.C.

D. The Flood Protection Elevation (FPE) shall be the BFE plus one foot *(or optional desired freeboard amount)*.

ORSC Requirement in Coastal High Hazard Areas, R322.3.2.

The lowest floor must be elevated one foot or more above the BFE. Elevating one foot above the BFE allows homeowners to receive a substantial reduction in the cost of their flood insurance, and allows for an additional margin of safety.

CRS credit for freeboard can be as high as 300 points for three feet or more, provided under Section 431.a.

E. The floodway shall be delineated on the site plan as designated on the FIRM, Flood Boundary Floodway Map, or in accordance with Sections 3.3.F.

44 CFR § 60.3(b)(4)

F. Where BFE and floodway data have not been provided in SFHAs, the *(floodplain administrator)* shall obtain, review and reasonably utilize any BFE and floodway data available from a federal, state or other source.

Draft or Preliminary Flood Insurance Studies may be used, per FEMA, *Floodplain Management Bulletin 1-98: Use of Flood Insurance Study (FIS) Data as Available Data*.

CRS credit is provided for adopting regulatory data, such as base flood elevations and floodway delineations, in areas where they are not shown on the FIRM under Section 411.a.

3.4. Riparian Buffer Zone

RPA Requirement RPA Element 2(B)

A. The Riparian Buffer Zone (RBZ).

If the 170-foot RBZ extends beyond the Special Flood Hazard Area, this ordinance applies only to the limits of the Special Flood Hazard Area

1. The RBZ shall be delineated on the site plan by the applicant at the time of application for subdivision approval or floodplain development permit for all development proposals within 300 feet of any stream or shoreline.

3.5 Channel Migration Zone

DLCD is currently undertaking the Statewide Channel Migration Assessment Project – working to prioritize areas where detailed channel migration studies should be performed. There are no FEMA-designated CMZs at this time in Oregon.

A. The channel migration zone (CMZ) shall be the area as delineated on *(name of map that has been adopted for local regulatory purposes)*.

B. Where more than one CMZ has been delineated, the *(floodplain administrator)* shall use the delineation that has been adopted for other local regulatory purposes.

C. Where a CMZ has not yet been mapped, the provisions of Section 3.6.D shall apply at the time of permit application.

If there is no CMZ map that has been adopted by *(community name)* for regulatory purposes, the community may map and regulate the CMZs and in accordance with DLCD regulations.

There is CRS credit for mapping and regulating channel migration areas. For more information, see CRS Credit for

	Mapping and Managing Channel Migration Areas.

ORDINANCE LANGUAGE	COMMENTARY
Section 4. Administration	
4.1. Establishment of Floodplain Development Permit A floodplain development permit shall be obtained before construction or development begins within the Special Flood Hazard Area. The permit shall be for all development as set forth in Section 2. Definitions.	**44 CFR § 60.3(b)(1)** requires a permit for all development in the SFHA. The community does not need to adopt those parts of Section 4 that duplicate existing administrative provisions in other ordinances.
4.2. Floodplain Development Permit Application Application for a floodplain development permit shall be made on forms furnished by the *(floodplain administrator)* and shall include, but are not limited to: A. One or more site plans, drawn to scale, showing: 1. The nature, location, dimensions and elevations of the property in question; 2. Names and location of all lakes, water bodies, waterways, and drainage facilities within 300 feet of the site; 3. The boundaries of the SFHA, floodway, RBZ and CMZ, delineated in accordance with Section 3. 4. The proposed drainage system including, but not limited to, storm sewers, overland flow paths, detention facilities, and roads; 5. Existing and proposed structures, volume of new fill, area of new	Example permit application forms are available from FEMA in Unit 7.C of *National Flood Insurance Program (NFIP) Floodplain Management Requirements: A Study Guide and Desk Reference for Local Officials,* FEMA 480, February, 2005. The site plan needs to show all RBZs that affect the site, including those measured from water bodies outside the property.

pavement and other impervious surfaces, and sites for storage of materials;

6. All wetlands;

Wetlands are subject to other federal, state, or local regulations and are not addressed directly in this ordinance. However, it is important to know where these regulated areas are when reviewing the site plan, in order to ensure that all other laws as required by 44 CFR § 60.3(a)(2) are being applied.

7. Existing native vegetation and proposed revegetation to include a count of the number of trees greater than 6″ diameter at breast height (dbh) to be removed and the number of new trees to be planted to meet mitigation requirements.

The percentage of native vegetation land coverage for the site may also be stated.

B. If the proposed project involves grading, excavation or filling, the site plan shall include proposed post-development terrain at one-foot contour intervals and provide calculation of the total area land to be cleared and/or graded.

This list is the same information required for a FEMA Elevation Certificate (**Appendix G**).

C. If a project disconnects land from the floodplain (e.g., by accredited levees or recognition of non-accredited levees), identify the type of project and the amount of land disconnected from the floodplain. This effectively describes loss of refugia for rearing of fish and indicates factors that increase BFE and flood velocities.

D. If a project reconnects land to the floodplain (e.g., the removal or setback of a levee) identify the type of project and amount of land reconnected to the floodplain. This is indicative of effectiveness of mitigation or of beneficial habitat restoration.

E. If the proposed project includes a new structure, substantial improvement or repairs

to a substantially damaged structure that will be elevated, the application shall include the FPE (for sites in designated V Zones) or BFE (for sites in other designated zones within the SFHA) for the building site and the proposed elevations of the following:

1. The top of the bottom floor (including basement, crawlspace or enclosure floor);
2. The top of the next higher floor;
3. The bottom of the lowest horizontal structural member (V Zones only);
4. The attached garage (top of slab);
5. Lowest elevation of machinery or equipment servicing the building;
6. Lowest adjacent (finished) grade next to building;
7. Highest adjacent (finished) grade next to building; and
8. Lowest adjacent grade at lowest elevation of deck or stairs, including structural support.

Item 3) may be omitted in communities with no designated V Zones.

RPA Requirement 2.A.i.b 5.A

F. If the proposed project includes a new structure, substantial improvement, or repairs to a substantially damaged nonresidential structure that will be dry floodproofed, the application shall include the FPE for the building site, the elevation in relation to the datum of the effective FIRM to which the structure will be dry floodproofed, and a certification by a registered professional engineer or licensed architect that the dry floodproofing methods meet the floodproofing criteria in Section 6.3.

44 CFR § 60.3(a)(2)

Many communities have developed their own checklists showing what permits are required for different areas and different types of projects.

G. The application shall include a description of the extent to which a water body, including its shoreline, will be altered or relocated as a result of the proposed project, as well as

proposed mitigation measures to offset potential adverse effects.

1. Description of how potential adverse effects will be mitigated to the greatest extent feasible, with the objective of achieving no net loss or beneficial gain of natural floodplain functions.

2. A description of long-term performance monitoring procedures and assurances to ensure that the mitigation will function in perpetuity shall be included in the application.

H. The application shall include acknowledgement that the applicant will apply for all necessary permits required by federal, state, or local laws. The application shall include written acknowledgement that the applicant understands that the final certification of use or certificate of occupancy will be issued only if the applicant provides copies of the required federal, state, and local permits or letters stating that a permit is not required. The floodplain development permit is not valid if those other permits and approvals are not obtained prior to any ground disturbing work or structural improvements.

I. The application shall include acknowledgment by the applicant that representatives of any federal, state, or local unit of government with regulatory authority over the project are authorized to enter upon the property to inspect the development.

4.3. Floodplain Development Permit Expiration

If there has been no "start of construction," a floodplain development permit shall expire 180 days after the date of issuance. Where the applicant documents a need for an extension beyond this period due to conditions beyond the applicant's control, the *(floodplain administrator)* may authorize one or more extensions.

See also the definition of "Start of Construction."

4.4. Designation of the *(Floodplain Administrator)*

The *(floodplain administrator)* is hereby appointed to administer and implement this ordinance by granting or denying floodplain development permit applications in accordance with its provisions.

44 CFR § 59.22(b)(1)

The "floodplain administrator" can be an agency, a full-time staff person, a part-time staff assignment, or a contractor to the community.


CRS Credit is provided under Section 431.n if the floodplain administrator is trained and/or a Certified Floodplain Manager. For more information about the CFM® program, see www.floods.org.

4.5. Duties of the *(Floodplain Administrator)*

Duties of the *(floodplain administrator)* shall include, but not be limited to:

A. Review all floodplain development permits to determine that the permit requirements of this ordinance have been satisfied.

B. Review all floodplain development permits to determine that all necessary permits have been obtained from those federal, state, or local governmental agencies from which prior approval is required, including any permits that may be required to assure compliance with the Endangered Species Act and/or other appropriate federal or state laws.

44 CFR § 60.3(a)(2)

See also Section 4.2.F.

C. Review all floodplain development permits to determine if the proposed development is located in the RBZ. If located in the RBZ ensure that the provisions of Section 7 are met.

D. Ensure that all development activities within the SFHA in the jurisdiction of *(community name)* meet the requirements of this ordinance.

E. Inspect all development projects before, during, and after construction to ensure

compliance with all provisions of this ordinance, including proper elevation of the structure.

F. Maintain for public inspection all records pertaining to the provisions of this ordinance.

44 CFR § 60.3(b)(5)(iii)

G. Submit to FEMA a report on each floodplain development permit issued. Such reports are to include:

ESA Requirement (RPA Element 5.A)

1. The amount of fill or structural displacement of flood storage, and the amount of compensatory storage measured by volume and area (both surface area and cross-sectional area).

2. The amount of new impervious surface and any project change in the timing, velocity or peak flows of stormwater runoff and the types and amounts (if applicable) of mitigation provided.

3. The area in which clearing and/or grading occurred (e.g. within the HHA, SFHA or AFCFH).

4. The number of trees equal to or greater than six inches diameter at breast height (dbh) removed and the number and timing of trees planted to meet mitigation requirements.

5. If a project disconnects land from the floodplain (e.g. by accreditation of levees or recognition of non-accredited levees), identify the type of project and the amount of land disconnected from the floodplain.

6. If a project reconnects land to the floodplain (e.g. the removal or setback of a levee), identify the type of project and amount of land reconnected to the floodplain.

7. The location of the project and of the

corresponding mitigation (e.g. within the SFHA, CMZ, or RBZ).

H. Notify FEMA of any proposed amendments to this ordinance.

I. Cooperate with federal and state agencies to improve flood and other technical data and notify FEMA of any new data that would revise the FIRM.

4.6. Records

A. Where BFE data have been obtained pursuant to Sections 3.3 and 3.6, the *(floodplain administrator)* shall obtain, record, and maintain the actual "finished construction" elevations for the locations listed in Section 4.2.C. This information shall be recorded on a current FEMA Elevation Certificate (FEMA Form 81-31, **Appendix G**), signed and sealed by a professional land surveyor, currently licensed in the State of Oregon.

44 CFR §§ 60.3(b)(5)(i) and (iii)

See also Section 4.7.A.1.

Use of the FEMA Elevation Certificate form is optional, except for CRS communities.

B. For all new or substantially improved dry floodproofed nonresidential structures, where BFE data have been obtained pursuant to Sections 3.3 and 3.6, the *(floodplain administrator)* shall obtain, record, and maintain the elevation (in relation to the datum of the effective FIRM) to which the structure was floodproofed. This information shall be recorded on a current FEMA Floodproofing Certificate (FEMA Form 81-65) by a professional engineer licensed in the State of Oregon.

44 CFR §§ 60.3(b)(5)(ii) and (iii)

See also Sections 4.2.D, 4.7.A.1 and 6.3.D.

Use of the FEMA Floodproofing Certificate is optional, except for CRS communities.

4.7. Certificate of Occupancy

A. A certification of use for the property or a certificate of occupancy for a new or substantially improved structure or an addition shall not be issued until:

1. The permit applicant provides a properly completed, signed and sealed Elevation or Floodproofing Certificate showing

If the certificate of use or occupancy is issued by another office, procedures would be needed to make sure the floodplain administrator is contacted prior to one being issued. The terms used in this ordinance should be consistent

finished construction data as required by Section 4.6;

with the rest of the community's development regulations.

If the community is a non-CRS community, then the Elevation and Floodproofing Certificates are optional; however, the type of information included in said certificates is not, and must be submitted prior to issuance of certificate of occupancy and must be retained in perpetuity.

2. The applicant provides copies of all required federal, state, and local permits noted in the permit application, per Section 4.2.F; and

3. All other provisions of this ordinance have been met.

B. The *(floodplain administrator)* may accept a performance bond or other security that will ensure that unfinished portions of the project will be completed after the certification of use or certificate of occupancy has been issued.

There may be parts of the project that cannot be finished, even though the site is ready for use. An example would be the monitoring and maintenance of vegetation or restoration projects.

4.8. Board of Appeals

A. The *(Board of Appeals/Hearings Examiner/etc.…)* as established by *(Ordinance)* shall hear and decide appeals and requests for variances from the requirements of this ordinance.

B. The *(Board of Appeals/Hearings Examiner/etc.…)* shall hear and decide appeals when it is alleged there is an error in any requirement, decision or determination made by the *(floodplain administrator)* in the enforcement or administration of this ordinance.

C. Those aggrieved by the decision of the *(Board of Appeals/Hearings Examiner/etc.…)*, or any taxpayer, may appeal such decision to the *(Board of Appeals/Hearings Examiner/etc.…)*.

D. Upon consideration of the factors of Section

4.9 and the purposes of this ordinance, the *(Board of Appeals/Hearings Examiner/etc.…)* may attach such conditions to the granting of variances as it deems necessary to further the purposes of this ordinance.

E. The *(floodplain administrator)* shall maintain the records of all appeal actions and report any variances to FEMA upon request.

4.9. Variance Criteria

A. In reviewing applications for a variance, the *(Board of Appeals/Hearings Examiner/etc.…)* shall consider all technical evaluations, all relevant factors, standards specified in other sections of this ordinance, and:

1. The danger to life and property due to flooding or erosion damage;

2. The danger that materials may be swept onto other lands to the injury of others;

3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;

4. The importance of the services provided by the proposed facility to the community;

5. The necessity to the facility of a waterfront location, where applicable;

6. The availability of alternative locations for the proposed use which are not subject to flooding, erosion damage, or channel migration;

7. The compatibility of the proposed use with existing and anticipated development;

8. The relationship of the proposed use to

44 CFR § 60.6(a)

Communities are encouraged to adopt standards equal to or more restrictive than 44 CFR § 60.6 (a) or use existing codes that meet or exceed these standards.

FEMA may review a community's findings justifying the granting of variances, and if that review indicates a pattern inconsistent with the objectives of sound floodplain management, FEMA may take appropriate action under **44 CFR § 59.24(b)**.

the comprehensive plan and floodplain management plan for that area;

9. The safety of access to the property in times of flood for ordinary and emergency vehicles;

10. The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters, and the effects of wave action, if applicable, expected at the site

11. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems, and streets and bridges;

12. The potential of the proposed project to create an adverse effect on federal, state or locally protected species or habitat;

13. The potential of the proposed project to affect, or be affected by, channel migration;

14. Whether the proposed project is compliant with the Endangered Species Act; and

15. The variance is the minimum necessary, considering the flood hazard, to afford relief.

Items 12), 13) and 14) are **ESA Requirements**

B. No variance shall be granted to the requirements of this ordinance unless the applicant demonstrates that:

1. The proposed project cannot be located outside the SFHA;

2. An exceptional hardship would result if the variance were not granted;

3. The relief requested is the minimum necessary;

4. The applicant's circumstances are unique and do not represent a problem faced by other area properties;

5. If the project is within a designated floodway, no increase in flood levels during the base flood discharge would result;

6. The project will not adversely affect features or quality of habitat supporting federal, state, or locally protected fish or wildlife;

7. There will be no additional threat to public health, safety, beneficial stream or water uses and functions, or creation of a nuisance;

8. There will be no additional public expense for flood protection, lost environmental functions, rescue or relief operations, policing, or repairs to streambeds, shorelines, banks, roads, utilities, or other public facilities; and

9. All requirements of other permitting agencies will still be met.

C. Variances requested in connection with restoration of a historic site, building or structure may be granted using criteria more permissive than the above requirements, provided:

1. The repair or rehabilitation is the minimum necessary to preserve the historic character and design of the site, building, or structure; and

2. The repair or rehabilitation will not result in the site, building, or structure losing its historic designation.

If the issue is not specific to the property, but is a problem faced by other properties, the ordinance should be revised, rather than a variance issued.

Features or quality of habitat include, but are not limited to, water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refugia.

D. Variances may be requested for new construction, substantial improvements, and other development necessary for the conduct of functionally dependent uses, provided:

1. There is good and sufficient cause for providing relief;

2. The variance is the minimum necessary to provide relief;

3. The variance does not cause a rise in the 100-year flood level within the regulatory floodway;

4. The project will not adversely affect federal, state, or locally protected fish, wildlife, or their habitats, or the functions associated with said habitat.

E. Alternative process to demonstrate protection of habitat functions**.**

1. For projects qualifying for a variance under section 4.9 D, an assessment of the impact of the project on federal, state, or locally protected species and habitat, water quality, and aquatic and riparian habitat shall be provided. The assessment shall be:

2. For Projects authorized, funded, or undertaken by a federal agency, a Biological Evaluation or Biological Assessment developed per 50 C.F.R. § 402.12 to initiate federal interagency consultation under Endangered Species Act section 7(a)(2); or

3. Documentation that the activity fits within Section 4(d) of the Endangered Species Act; or

4. Documentation that the activity fits within a Habitat Conservation Plan approved pursuant to Section 10 of the Endangered Species Act, where any such

assessment has been prepared or is otherwise made available; or

5. An assessment prepared in accordance with *Regional Guidance for Floodplain Habitat Assessment and Mitigation,* FEMA Region 10, 2018. The assessment shall demonstrate through analysis that the project would not adversely affect:

6. Species that are federal, state, or local listed as threatened or endangered.

7. The primary constituent elements for critical habitat, when designated, including but not limited to water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refugia for listed salmonids.

8. Essential Fish Habitat designated by the National Marine Fisheries Service.

9. Fish and wildlife habitat conservation areas.

10. Other protected areas and elements necessary for species conservation.

F. Variances to the provisions of Section 6 of this ordinance may be issued for a structure on a lot contiguous to and surrounded by lots with existing structures constructed below the FPE, provided the other variance criteria are met. The applicant for such a variance shall be notified in writing that the structure (1) will be subject to increased premium rates for flood insurance up to amounts as high as $25 for $100 of insurance coverage; and (2) such construction below the FPE increases risks to life and property. Such notification shall be maintained with a record for all variance actions.

G. Variances pertain to a physical piece of property. They are not personal in nature and

are not based on the inhabitants or their health, economic, or financial circumstances.

ORDINANCE LANGUAGE	COMMENTARY
Section 5. General Development Standards The provisions of this section shall apply in the Special Flood Hazard Area.	**44 CFR § 60.3(a)** unless otherwise stated
5.1. Anchoring	
A. All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.	**44 CFR § 60.3(a)(3), ORSC Requirement R322.1.2 and OSSC Requirement 1612.5.2.**
B. All manufactured homes must likewise be anchored to prevent flotation, collapse, or lateral movement, and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors.	**24 CFR § 3285.102(d)(1) and 44 CFR § 60.3(b)(8).** For further information see *Protecting Manufactured Homes from Floods and Other Hazards: A Multi-Hazard Foundation and Installation Guide,* FEMA P-85, Second Edition, November, 2009.
5.2. Construction Materials and Methods	
A. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.	
B. All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.	
C. Electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during flooding.	
5.3 Utilities	
A. All new and replacement water supply	**44 CFR § 60.3(a)(5) and ORSC Requirement R322.1.7**

systems shall be designed to minimize or eliminate infiltration of flood waters into the system.

B. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters.

44 CFR § 60.3(a)(6) and ORSC Requirement R322.1.7

C. Onsite waste disposal systems shall be located to avoid impairment to them, or contamination from them, during flooding consistent with the Oregon Department of Environmental Quality.

5.4 Subdivision Proposals

A. All proposals shall be consistent with the need to minimize flood damage.

B. All proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize or eliminate flood damage.

44 CFR § 60.3(b)(3)

C. All proposals shall demonstrate adequate drainage provided to reduce exposure to flood damage.

D. Where BFE data has not been provided, or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least 50 lots or 5 acres (whichever is less).

5.5 Review of Building Permits

Where elevation data is not available either through the Flood Insurance Study, FIRM, or from another authoritative source, applications for building permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness is a local judgment and includes use of historical data, high water marks, and photographs of past flooding, where available.

Failure to evaluate at least two feet above grade in these zones may result in higher insurance rates.

5.6 AH Zone Drainage

44 CFR § 60.3(c)(11)

Adequate drainage paths are required around structures on slopes to guide floodwaters around and away from proposed structures.

5.7 Floodway Standards

44 C.F.R. § 60.3(d)(3)

This is known as a "no rise" certificate, and is required for all development in the floodway that is not exempted in Sections 7.1 or 7.2.

A. In addition to the other requirements of this ordinance, a project to develop in the floodway as delineated pursuant to Sections 3.3.E, 3.3.F, or 3.5.D shall meet the following criteria:

1. The applicant shall provide a certification by a registered professional engineer demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed development would not result in any increase in flood levels during the occurrence of the base flood discharge.

2. New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated to a minimum of one foot above the base flood elevation.

3. Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must be either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:

(a) A minimum of two openings having

a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.

(b) The bottom of all openings shall be no higher than one foot above grade.

(c) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

B. In riverine Special Flood Hazard Areas where a floodway has not been delineated pursuant to Sections 3.3.E, 3.3.F, or 3.5.D, the applicant for a project to develop in the SFHA shall provide a certification by a registered professional engineer demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed development and all other past or future similar developments would not cumulatively result in an increase of flood levels during the occurrence of the base flood discharge by more than one foot.

44 C.F.R. § 60.3(c)(10).

The preferred approach is for larger developments to map the floodway, as per Section 3.5.D. In those cases, Section 7.5.A would apply. The FEMA Regional Office has guidance on how to conduct a case-by-case encroachment analysis.

Doing a case-by-case encroachment analysis is only required by the NFIP regulations in SFHAs where FEMA has provided a base flood elevation, but no floodway. This model recommends extending this language to all riverine floodplains that do not have a mapped floodway, such as approximate A Zones. It receives CRS credit under Section 411.a.

The NFIP standard is a one foot allowable surcharge, but the community may opt for a more restrictive standard. CRS credit is provided if the standard is less than one foot under Section 411.d.

ORDINANCE LANGUAGE	COMMENTARY
Section 6. Standards for Protection of Structures The provisions of this section shall apply in the Special Flood Hazard Area. All new structures and substantial improvements shall be protected from flood damage below the Base Flood Elevation.	
6.1. Applicability This section's protection requirement applies to all new structures and substantial improvements, which include:	**44 CFR § 59.1 and 44 CFR § 60.3(c)**
A. Construction or placement of a new structure;	
B. Reconstruction, rehabilitation, or other improvement that will result in a substantially improved building;	
C. Repairs to an existing building that has been substantially damaged;	
D. Placing a manufactured home on a site; and	Does not apply to returning an existing manufactured home to the same site it lawfully occupied before it was removed to avoid flood damages, provided it is not enlarged or altered in any way.
E. Placing a recreational vehicle or travel trailer on a site for more than 180 consecutive days.	
6.2. Flood Protection Standards	Section 6.2 applies to all structures. Section 6.3 provides an alternative protection measure that is only allowed for nonresidential buildings.
A. All new structures and substantial improvements shall have the lowest floor, including basement, elevated at or above the BFE.	**44 CFR §§ 60.3(c)(2), (7), and (8)** See also Section 3.3.D on the FPE. Optional, but recommended to obtain reduced flood insurance rates: Lowest floor, including basement, shall be elevated at least one foot above BFE.

If "and all additions" is added after "substantial improvements," CRS credit of 20 points is provided under Section 431.c. Under the language provided to the left, only additions that qualify as substantial improvements are subject to this section.

B. All materials below the BFE shall be resistant to flood damage and firmly anchored to prevent flotation. Materials harmful to aquatic wildlife, such as creosote, are prohibited below the BFE.

44 CFR §§ 60.3(a)(3)(ii-iv)
See Section 5.1.

C. Electrical, heating, ventilation, duct work, plumbing, air-conditioning equipment, and other service facilities shall be elevated above the BFE. Water, sewage, electrical, and other utility lines below the BFE shall be constructed so as to prevent water from entering or accumulating within them during conditions of flooding.

44 CFR § 60.3(a)(3)(iv)
See Section 5.2.C.

Full CRS credit for freeboard depends on machinery, equipment and ductwork (as well as the lowest floor) to be above the freeboard level.

D. Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters (i.e. wet floodproofing techniques). Designs for meeting this requirement shall either be certified by a registered professional engineer or licensed architect and/or meet or exceed the following minimum criteria:

1. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.

2. The bottom of all openings shall be no higher than one foot above grade.

44 CFR § 60.3(c)(5) and ORSC Requirement R322.2.2

Insurance rates reflect an "all or nothing" standard, meaning partially ventilated crawlspaces may be subject to a higher insurance premium.

More details, and illustrations, on these construction standards can be found in FEMA Technical Bulletin 11-01, *Crawlspace Construction for Buildings Located in Special Flood Hazard Areas, National Flood Insurance Program Interim Guidance, November, 2001.*

An alternative to this language can receive CRS credit of up to 300

3. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

points for prohibiting enclosed areas below the elevated lowest floor. Such a prohibition is preferred because the enclosed areas are prone to alteration because a permit officer cannot see what is happening. For more information on this credit, including ordinance language, see CRS Credit for Higher Regulatory Standards.

This section can be deleted for communities with no coastal high hazard area mapped as a V Zone.

E. In Coastal High Hazard Areas (designated V Zones), new structures and substantial improvements shall be elevated on pilings or columns so that:

44 CFR § 60.3(e)(4) and ORSC Requirement R322.3.2

1. The bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to a minimum of one foot above the BFE.

44 CFR § 60.3(e)(4), ORSC Requirement R322.3.3 and OSSC Requirement 1612.5.2.

2. The pile or column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Wind and water loading values shall each have a one percent chance of being equaled or exceeded in any given year (100-year mean recurrence interval).

44 CFR § 60.3(e)(5)

3. The areas below the lowest floor that are subject to flooding shall be free of obstruction or constructed with non-supporting breakaway walls. If breakaway walls are utilized, such enclosed space shall NOT be used for human habitation.

The NFIP regulations allow for breakaway walls to enclose the lower area, but such walls are not as dependable as keeping the area open. For more information on breakaway walls, see FEMA Technical Bulletin 9-99, *Design and Construction Guidance for Breakaway Walls,* August 2008.

CRS credit of 75 points is provided for this language that

	prohibits all enclosures in V Zones (Section 431.h.)
4. The structure or improvement shall be located landward of the reach of mean high tide.	**44 CFR § 60.3(e)(3) and ORSC Requirement R322.3.1**
5. The use of fill for structural support of a structure or addition is prohibited.	**44 CFR § 60.3(e)(6) and ORSC Requirement R322.3.2**
6. A registered professional engineer or architect shall develop or review the structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting these provisions.	**44 CFR § 60.3(e)(4)**
7. Man-made alteration of sand dunes which would increase potential flood damage is prohibited.	**44 CFR § 60.3(e)(7) and ORSC Requirement R322.2.3.1**
8. For construction of new essential and new special occupancy structures refer to ORS 455.446 and 447 which state that new essential and new special occupancy structures may not be constructed in the Tsunami Inundation Zone. The Tsunami Inundation Zone would include V, A, and potentially other flood zones. If an exception is granted, then the Coastal High Hazard Area construction standards in the model ordinance shall apply to the building of these new structures in the Tsunami Inundation Zone. Coastal communities should be encouraged to apply Coastal High Hazard Area standards to all new structures or substantially improved or damaged structures that fall within the Tsunami Inundation Zone.	Optional, but recommended to

6.3 Nonresidential Construction

New construction and substantial improvement of any commercial, industrial, or other nonresidential structure shall either have the lowest floor, including basement, elevated at or above the BFE; or, together with attendant utility and sanitary facilities, shall:

A. Be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water.

B. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

C. Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications, and plans.

D. Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in Section 6.2.D.

E. Applicants floodproofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g. a building floodproofed to the base flood level will be rated as one foot below).

F. Applicants shall supply a comprehensive Maintenance Plan for the entire structure to include, but not limited to, exterior envelope of structure; all penetrations to the exterior of the structure; all shields, gates, barriers, or components designed to provide floodproofing protection to the structure; all seals or gaskets for shields, gates, barriers, or components; and, the location of all shields,

obtain reduced flood insurance rates: Lowest floor, including basement, shall be elevated at least one foot above BFE.

44 CFR § 60.3(c)(3)

44 CFR § 60.3(c)(3)

44 CFR § 60.3(c)(4)

44 CFR §§ 60.3(c)(3) and (5)

Applicants who are dry floodproofing nonresidential buildings should be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g. a building dry floodproofed to the base flood level will be rated as one foot below). Floodproofing the building an additional foot will reduce insurance premiums significantly.

gates, barriers, and components as well as all associated hardware, and any materials or specialized tools necessary to seal the structure.

G. Applicants shall supply an Emergency Action Plan (EAP) for the installation and sealing of the structure prior to a flooding event that clearly identifies what triggers the EAP and who is responsible for enacting the EAP.

44 CFR § 60.3(c)(4)

6.4. Manufactured Homes

All manufactured homes to be placed or substantially improved on sites shall be:

A. Elevated on a permanent foundation in accordance with Section 6.2, and

44 CFR § 60.3(c)(6) sets these standards, but (c)(12) allows a lower standard in existing manufactured home parks. On those sites, the structure need only be elevated three feet above grade. All manufactured homes are encouraged to be protected to the known flood hazard, so this language is recommended.

Because of the above stated NFIP standard, if the community adopts this section's language and has an existing manufactured home park where the base flood is more than three feet deep, the CRS credit is 50 points (Section 431.o).

B. All manufactured homes must be anchored to prevent flotation, collapse, or lateral movement and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to other applicable anchoring requirements for resisting wind forces.

See Section 5.1.B.

C. Manufactured dwellings supported on solid foundation walls shall be constructed with

flood openings that comply with Section 6.2.D above.

44 CFR § 60.3(c)(5)

D. The bottom of the longitudinal chassis frame beam in A zones, shall be at or above BFE.

44 CFR § 60.3(c)(12)

E. Electrical crossover connections shall be a minimum of 12 inches above BFE.

44 CFR § 60.3(c)(14)

6.5 Recreational Vehicles

Recreational vehicles placed on sites shall:

44 CFR § 60.3(c)(14)

A. Be on the site for fewer than 180 consecutive days, and

B. Be fully licensed and ready for highway use, on their wheels or jacking system, attached to the site only by quick disconnect type utilities and security devices, and have no permanently attached additions; or

C. Meet the requirements of Section 6.4 above.

6.6. Small Accessory Structures

Relief from elevation or floodproofing as required may be granted for small accessory structures that are:

For additional guidance, see FEMA's Technical Bulletin 7-93, *Wet Floodproofing Requirements for Structures Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program,* December, 1993.

A. Less than 200 square feet and do not exceed one story;

B. Not temperature controlled;

C. Not used for human habitation and are used solely for parking of vehicles or storage of items having low damage potential when submerged;

D. Not used to store toxic materials, oil or gasoline, or any priority persistent pollutant identified by the Oregon Department of Environmental Quality, unless confined in a tank installed in compliance with this ordinance or stored at least one foot above Base Flood Elevation;

E. Located and constructed to have low damage potential;

F. Constructed with materials resistant to flood damage;

G. Anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, during conditions of the base flood;

H. Constructed to equalize hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwater. Designs for complying with this requirement must be certified by a licensed professional engineer or architect or:

1. Provide a minimum of two openings with a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;

2. The bottom of all openings shall be no higher than one foot above the higher of the exterior or interior grade or floor immediately below the opening; and

3. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided they permit the automatic flow of floodwater in both directions without manual intervention.

I. Constructed with electrical and other service facilities located and installed so as to prevent water from entering or accumulating within the components during conditions of the base flood.

J. The project meets all the other requirements of this ordinance, including Section 7.

ORDINANCE LANGUAGE	COMMENTARY
Section 7. Standards for Habitat Protection	
The provisions of this section shall apply in the Special Flood Hazard Area.	The objective of this section is to protect habitat and existing natural floodplain functions. This Model Ordinance pertains to RPA Element 2: Interim Measures to comply with the ESA. Communities may either adopt this ordinance that limits development and provides mitigation measures required to achieve no net loss of habitat function; or submit documentation that shows where functioning habitats exist and limit this section to those areas.
7.1. Non-Development Activities	
Activities that do not meet the definition of "development" are allowed in the SFHA without the need for a floodplain development permit under this ordinance, provided all other federal, state, and local requirements are met. The following are examples of activities and uses not considered development or "man-made changes to improved or unimproved real estate."	44 CFR 59.1
A. Routine maintenance of landscaping that does not involve grading, excavation, or filling;	
B. Removal of noxious weeds and hazard trees and replacement of non-native vegetation with native vegetation;	
C. Normal maintenance of structures, such as re-roofing and replacing siding, provided such work does not qualify as a substantial improvement;	
D. Normal maintenance of above ground utilities and facilities, such as replacing downed power lines and utility poles;	Digging up or replacing underground utilities would require a permit to determine if the project

would adversely affect habitat that could be disturbed.

E. Normal street and road maintenance, including filling potholes, repaving, and installing signs and traffic signals, but not including expansion of paved areas;

F. Normal maintenance of a levee or other flood control facility prescribed in the operations and maintenance plan for the levee or flood control facility are allowed in the SFHA without need for a floodplain development permit. Normal maintenance does not include repair from flood damage, expansion of the prism, expansion of the face or toe or addition for protection on the face or toe with rock armor; and

G. Agricultural and forestry practices that do not involve, filling, grading, or construction of levees or structures on land in the SFHA and in existence as of the effective date of this ordinance do not require a floodplain development permit.

ESA Requirement (RPA Errata, p.5) *Clarification and Errata to the Reasonable and Prudent Alternative issued with the Biological Opinion for the National Flood Insurance Program in Oregon,* January 24, 2017

7.2. Activities Allowed with a Floodplain Permit

The following activities are allowed in the SFHA without the analysis required in Section 7.4 or the habitat impact assessment required under Section 7.7, providing all other requirements of this ordinance are met, including obtaining a floodplain development permit:

Floodplain development permits will be required for all actions not listed in Section 7.1. The projects listed in Section 7.2 are only exempt from the floodway analysis in Section 7.4 and habitat impact assessment required in Sections 7.7. They must still meet all the other requirements of this ordinance.

ESA requirement (RPA Element 2.B)

A. Repairs or remodeling of an existing structure, provided that the repairs or remodeling are not a substantial improvement or a repair of substantial damage and do not exceed the existing footprint of the structure.

B. If the structure is in the floodway, there shall be

no change in the structure's dimensions without a No Rise analysis.

C. Activities with the sole purpose of creating, restoring, or enhancing natural floodplain functions provided the activities do not include structures, grading, fill, or impervious surfaces.

D. Development of open space and recreational facilities, such as parks, trails, and hunting grounds, that do not include structures, fill impervious surfaces, or removal of more than 5% of native vegetation on that portion of the property within the Special Flood Hazard Area.

E. Repair to onsite septic systems provided the ground disturbance is the minimum necessary.

7.3. Other Activities

All other activities not listed in Sections 7.1 or 7.2, are allowed by a floodplain development permit, provided they meet all the other requirements of this ordinance, including the analysis required in Section 7.4 or the habitat impact assessment required under Section 7.7, and a floodplain development permit is issued.

The local zoning and land use regulations should be cited by title and section number.

7.4. Compensatory Mitigation Standards

ESA requirement (RPA Element 2.A)

A. The *(floodplain administrator)* shall use the most restrictive data available for the 10-year floodplain (where a Flood Insurance Study has been performed), the floodway (if designated), the CMZ (if designated), or if none of those areas have been designated by FEMA, then within all portions of the RBZ that are within the SFHA.

CRS credit of 70 points is provided for compensatory storage under Section 431.f.2.

B. New development shall not reduce the effective flood storage volume or vegetative cover or increase the amount of impervious area within the Special Flood Hazard Area. A development proposal with an activity that would impact the three natural floodplain functions above shall provide compensatory mitigation to achieve no net loss of natural floodplain functions as

Clarification and Errata to the Reasonable and Prudent Alternative issued with the Biological Opinion for the National Flood Insurance Program in Oregon, January 24, 2017

outlined below.

C. In the larger of the 10-year floodplain (as determined by a Flood Insurance Study), the floodway, or the CMZ within the limits of the SFHA, the following mitigation standards apply:

1. Lost flood storage volume replaced at a ratio of 2 to 1.

2. Tree removal replaced at a ratio of 3 to 1 for trees equal to or exceeding 6-inch DBH.

In the remainder of the floodplain within the SFHA limits, the following mitigation standards apply:

1. Lost flood storage volume replaced at a ratio of 1.5 to 1.

2. Tree removal replaced at a ratio of 2 to 1 for trees equal to or exceeding 6-inch DBH.

D. Addition of new impervious surfaces must be mitigated by removing an equal amount of impervious surface and/or by increasing infiltration of stormwater using low impact development or green infrastructure practices. When neither of these methods is possible, stormwater detention is required to ensure no increase in peak volume or flow, and treatment is required to minimize pollutant loading.

E. Where implementation of the mitigation standards set forth above in Section 7.4.B. and C. is impracticable, a community may propose alternative mitigation standards, which will be acceptable if both FEMA and NMFS agree that the alternative standards provide habitat protection equivalent to that provided by the measures above.

RPA 2.A.i
If only one of the measures (10-year floodplain, floodway, or CMZ) are available that should be the applicable measure. If none of these areas have been designated (by FEMA, the state, or the community), then the applicable area would be the 170-foot RBZ. A community may elect to use the RBZ in lieu of other available measures if the RBZ is larger than the other available measures.

RPA 2.A.ii

CRS credit is provided under Section 451.e for low impact development stormwater management practices, if they are enforced throughout the community.
RPA 2.A.iii

RPA 2.A.iv