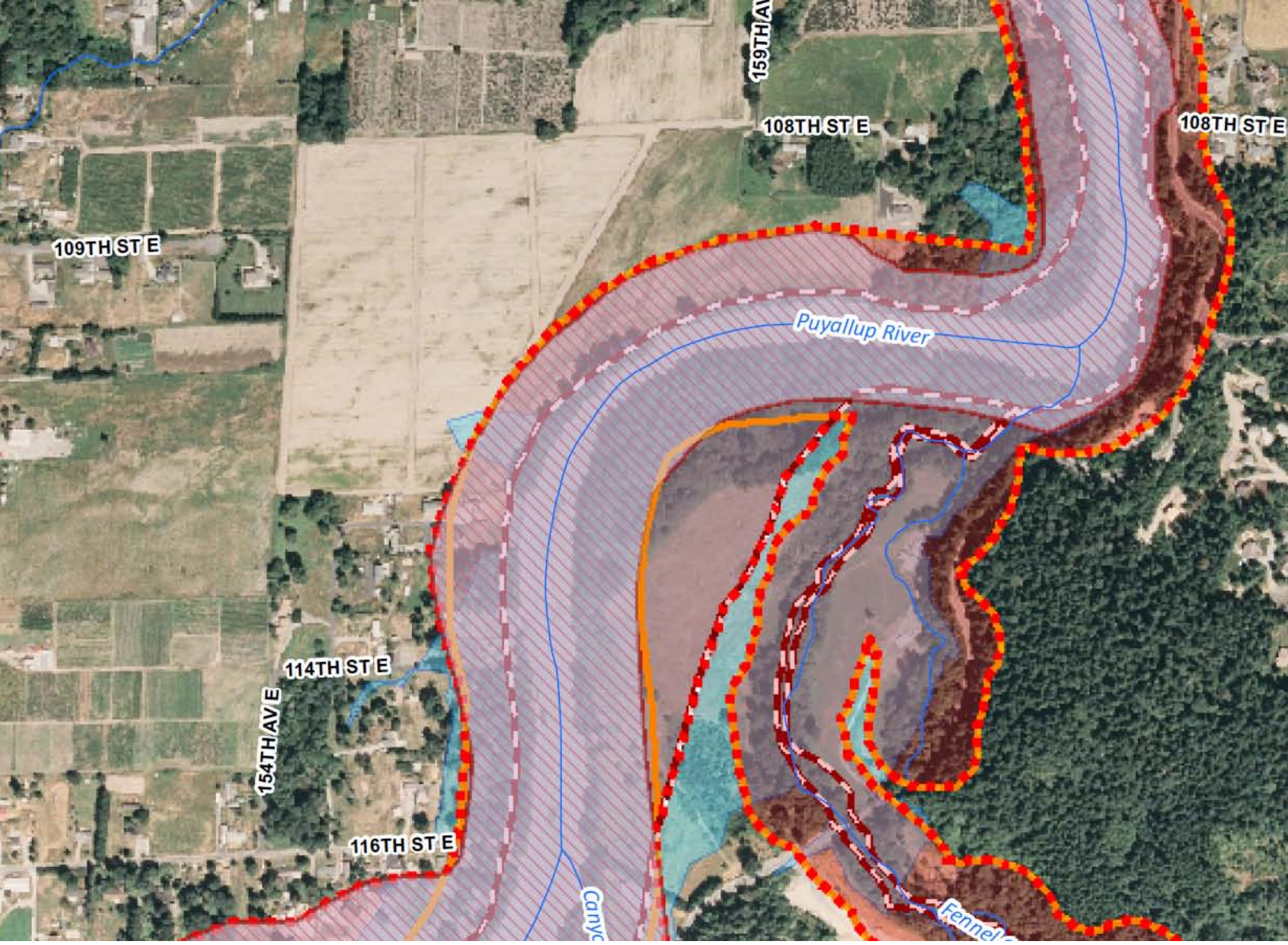

Floodplain Management and the Endangered Species Act

A Model Ordinance

April, 2011

FEMA Region 10

Model Ordinance for Floodplain Management

under the

National Flood Insurance Program

and the

Endangered Species Act

Produced by FEMA - Region 10
April 2011

FEMA
Region 10

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Acknowledgements

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

It was prepared with the advice and assistance of a special advisory committee that included representatives from:

- City of Auburn
- City of Carnation
- City of Everett
- Jefferson County
- King County
- City of Lacey
- Lummi Nation
- City of Monroe
- National Marine Fisheries Service
- Pierce County
- San Juan County
- Snohomish County
- City of Tukwila
- Washington State Department of Ecology
- Whatcom County

While some comments were not incorporated, the reviews of each agency in a common endeavor to make this a useful regulatory tool are appreciated.

This document was drafted by French & Associates, Ltd., Steilacoom, ESA Adolfson, Seattle, and PBS&J, Seattle, through an arrangement with the Insurance Services Office and the Community Rating System. This document was reviewed and commented upon by Edward A. Thomas Esq., of Michael Baker Jr., Inc.

Introduction

Background

The National Flood Insurance Program (NFIP) was created in 1968 as a way to offer an alternative to disaster assistance for properties subject to flood damage. In return for Federally supported flood insurance, local governments had to agree to regulate development in their floodplains in accordance with the Program's criteria. Since 1979, the program has been administered by the Federal Emergency Management Agency (FEMA).

The NFIP has proven very effective as a way to shift the cost of flood damage from taxpayers to insurance policy holders. It has also steered development away from floodplains and set construction standards for development that is allowed.

This Washington home is one of many built to NFIP standards that were not demolished by the 2007 Chehlalis River flood.

As an insurance driven program, the NFIP is funded by insurance premiums, not tax dollars. The program is focused on protecting all new and substantially improved buildings. It sets minimum floodplain management standards that protect new buildings. As a result, buildings in the floodplain that meet the NFIP standards suffer 80% less flood damage than buildings constructed before the requirements went into effect. Under the floodway concept, the NFIP prevents development from substantially increasing flood damage on other properties.

However, while the minimum requirements of the NFIP protect the public health, safety, and welfare of the community by protecting buildings from the 100-year, or 1% chance flood, the program was not intended to address other floodplain management concerns, such as riparian habitat. Local ordinances that only address protecting insurable buildings may not protect natural and beneficial floodplain functions. Regulations that just meet the minimum NFIP requirements do not protect property from greater than 100-year floods and floods that occur outside the mapped Special Flood Hazard Area.

While buildings can be built to minimize 100-year flood damage, people may still be exposed to flood hazards, especially residents of floodprone homes who cannot get out in time (see box). Accordingly, it is a good practice (and FEMA recommends) that communities consider the NFIP as a starting point, and adopt higher regulatory standards that better meet local needs.

In 2008, the National Marine Fisheries Service issued a Biological Opinion. That opinion noted that continued implementation of the NFIP in the Puget Sound adversely affects the habitat of certain threatened and endangered species.

River rescue: In 1988, a home was constructed in the floodplain fringe of the Carbon River. It met all of the construction standards of the NFIP. When the Carbon River started to flood in 2007, the family tried to drive to high ground. Their van got stuck in waters that were too fast and deep for the Sheriff Department's river rescue team. A Coast Guard helicopter had to come to the rescue, hovering over the van and winching each person up, one at a time. In order to prevent such situations from occurring, Pierce County amended its floodway mapping standard to account for deep and fast moving water a standard that exceeds the NFIP minimum requirement adopted to protect lives and reduce public expenses.

The Model Ordinance

This Model Ordinance has been developed to provide example regulatory language to address the requirements spelled out in the Biological Opinion and example higher regulatory standards. It provides a set of rules to protect human development from flooding and to minimize the impact of new developments and redevelopment on public safety, public health, property, water quality, and aquatic and riparian habitat. It was prepared with advice and assistance from local officials, engineers, natural resources scientists, and planners from the Puget Sound area.

This Model Ordinance has four types of provisions. They are noted differently in the commentary in the column to the right of the model language:

1. The requirements of the National Flood Insurance Program, as specified in the Code of Federal Regulations (CFR), 44 CFR parts 59 and 60. NFIP requirements are noted with the CFR reference in the commentary.
2. Washington State laws for floodplain management are specified in Washington Administrative Code (WAC) titles 173 and 365. The commentary identifies the WAC section for State requirements that exceed the NFIP requirements.
3. Some provisions are needed to meet the requirements of the Biological Opinion issued by the National Marine Fisheries Service (see next page). These provisions are noted in the commentary as "ESA requirement" with a reference to the relevant section in the Biological Opinion.
4. Some provisions are strongly recommended because they go beyond protecting buildings from the 1% chance flood as mapped by FEMA. They address the need for higher regulatory standards where the hazard is greater and to include higher standards for public safety, public health, the properties of others, water quality, and habitat. More information on the rationale and need for efforts to not harm others can be found in the No Adverse Impact program of the Association of State Floodplain Managers (http://www.floods.org/index.asp?menuID=349&firstlevelmenuID=187&siteID=1).

> **"Sic utere tuo ut alienum non laedas"**
>
> "So use your own property that you do not injure another's property."
>
> Courts have followed this maxim, which characterizes overall landowner rights and duties pursuant to common law nuisance, trespass, strict liability, negligence, riparian rights, surface water law rights and duties, and statutory liability. At common law, no landowner (public or private) has a right to use his or her land in a manner that substantially increases flood or erosion damages on adjacent lands except in a dwindling number of jurisdictions applying the "common enemy" doctrine to diffused surface or flood waters. From *No Adverse Impact and The Courts: Protecting the Property Rights of All*

Most of the voluntary provisions are eligible for credit under the Community Rating System (CRS). The CRS icon – NFIP/CRS – identifies where provisions above the minimum requirements of the NFIP can receive CRS credit. The CRS is explained further in Appendix B and *CRS Credit for Habitat Protection*.

The Biological Opinion

A background on how floodplain development can affect habitat is included in Appendix C. On September 22, 2008, the National Marine Fisheries Service (NMFS) issued a Biological Opinion that required changes to the implementation of the National Flood Insurance Program in order to meet the requirements of the Endangered Species Act (ESA) in the Puget Sound watershed. FEMA offers two ways to meet this ESA requirement:

1. Prohibit all development in the floodway and other areas as specified by the RPA.

2. Enact regulations that allow development that meet the criteria specified in the Biological Opinion by either:
    a. Adopting this Model Ordinance, or
    b. Enforcing the same requirements in other ordinances, such as the growth management, zoning, or critical areas regulations.

If a community chooses not to enact regulations under the two options described above, then a third option of showing compliance with ESA on a permit by permit basis will be required. This will typically involve requiring applicants for floodplain development permits to develop in the Special Flood Hazard Area to submit permit applications to the National Marine Fisheries Service. If option 3 is chosen, NFIP communities must ensure that permit applicants have demonstrated compliance with ESA before issuing a floodplain development permit.

Option 2 is generally preferred by most communities. Option 2.b. may be an easier route for those cities and counties that have critical area and shoreline management regulations. For those communities, the Biological Opinion Checklist can be used to identify if they need to amend their existing regulations to meet the Biological Opinion's criteria. If the checklist shows that additional regulations need to be adopted, language from the noted section in the Model Ordinance can be used.

It should be noted that the NFIP regulations (44 CFR 60.3(a) (2)) require participating communities "to assure that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law." Under options 2.a. and b, NFIP communities must ensure that permit applicants meet the criteria established in the Biological Opinion. If option 3 is chosen, NFIP communities must ensure that permit applicants have consulted with NMFS and received approval before issuing a floodplain development permit.

Organization

This Model Ordinance does not prevent development. It requires that new development projects be reviewed to ensure that they do not adversely affect life safety, public health, other properties, water quality, and aquatic and riparian habitat. Here's how it works:

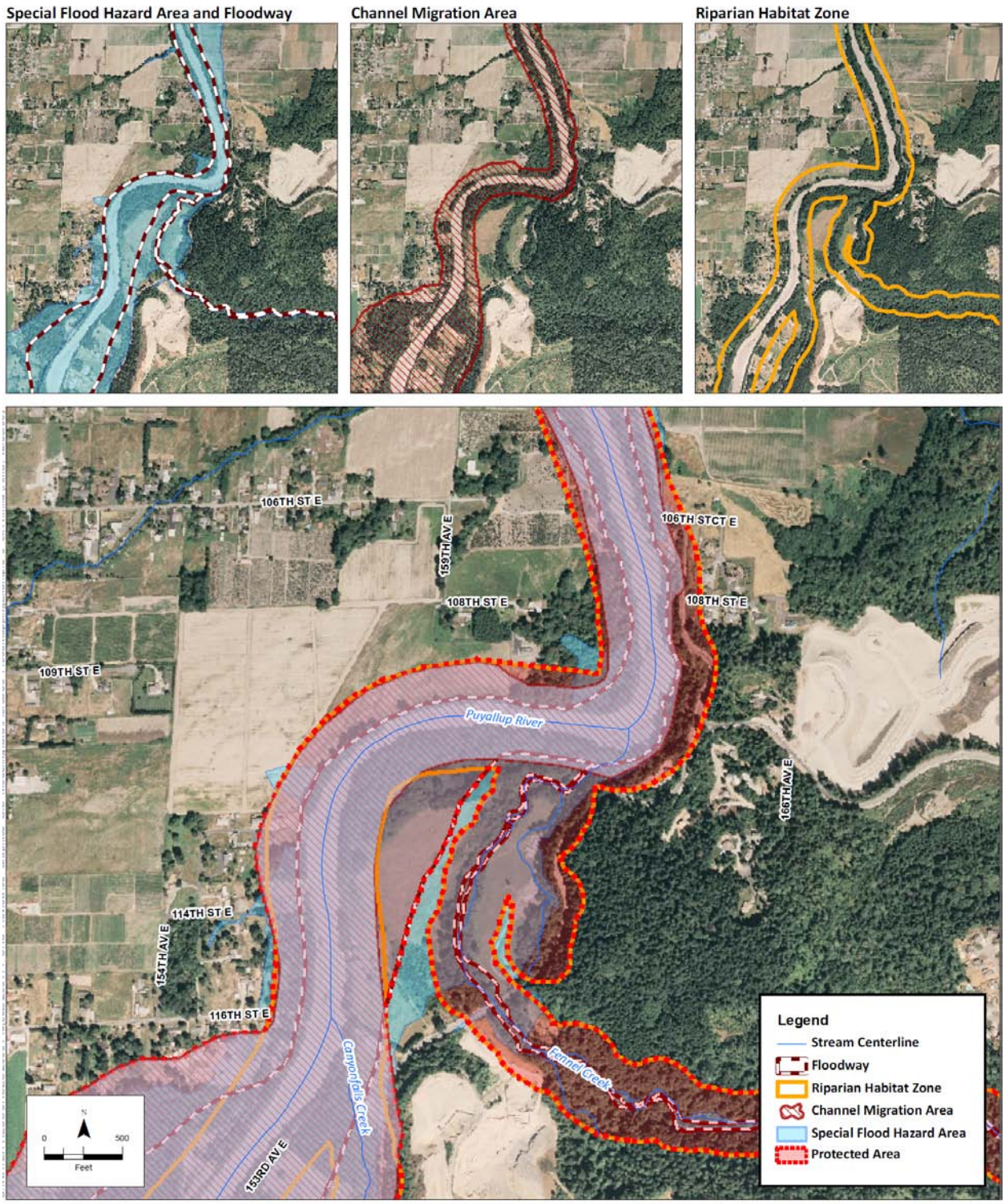
- Section 1 has the legal provisions needed for any regulatory program, such as the penalties clause.
- Section 2 defines the technical terms used in the ordinance.
- Section 3 defines the data needed for the flood and habitat protection requirements. The ordinance regulates development in the Regulatory Floodplain. The Regulatory Floodplain, as used in this model, is comprised of the Special Flood Hazard Area (SFHA) on the community's Flood Insurance Rate Map plus those parts of the Protected Area that extend outside the SFHA.
- The Protected Area determines where special habitat protection requirements must be met. It includes the floodway plus any riparian habitat areas and channel migration areas. A typical map of the Regulatory Floodplain and the Protected Area components is on the next page.
- Section 4 establishes procedures for permits and record keeping. All "development" in the Regulatory Floodplain must obtain a permit from the community (Section 4.1).

- General development standards that apply to all new development and redevelopment in the Regulatory Floodplain are listed in Section 5.
- Projects that involve construction, repairs, or improvements to buildings must meet certain standards for protection from flood damage (Section 6)
- Section 7 establishes the habitat protection criteria. Certain types of projects that have minimal risk of flood damage or impact on others are automatically allowed (Sections 7.1 – 7.2).
- Applications for projects that might increase flood hazards to other properties must include an engineering study to determine if flood heights would be impacted (Section 7.5)
- Applications for projects that might adversely affect habitat for threatened or endangered species must conduct an assessment to determine the impact (Section 7.7). If the assessment concludes that the project will adversely affect habitat, then either the permit is denied or the project is revised so that the adverse affect is mitigated (Section 7.8). Conducting the assessment and preparing a habitat mitigation plan are explained in more detail in *Regional Guidance for Floodplain Habitat Assessment and Mitigation* (see Appendix A). The mitigation plan must be implemented in order for the project to receive a certificate of occupancy (Section 4.7).

This process is shown graphically on page vi.

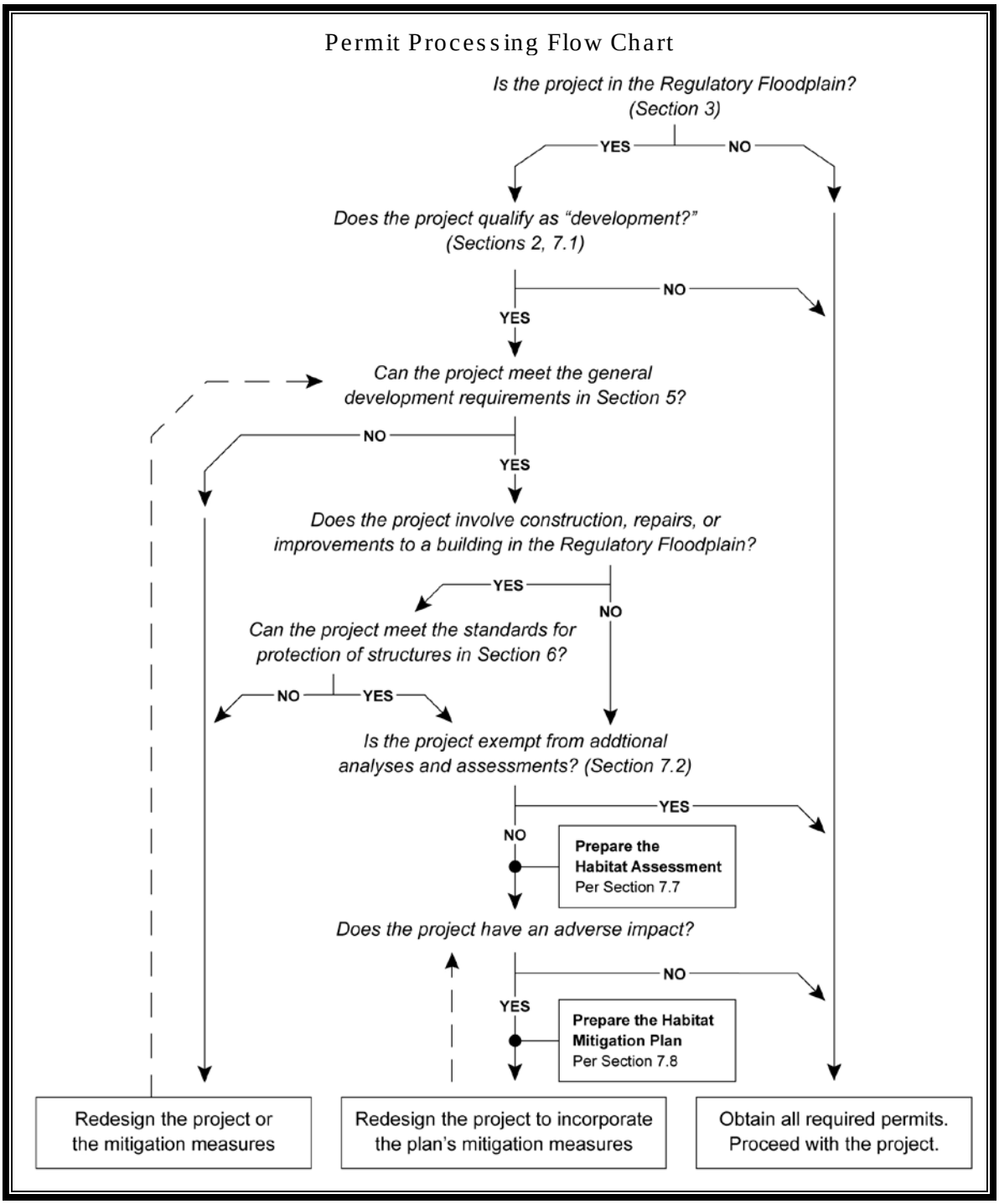
It is recommended that communities:

- Send their draft ordinance to the FEMA Region X office and the Washington Department of Ecology before it is adopted to ensure that it meets all Federal and State requirements.
- Keep this publication after the ordinance is adopted. The Commentary can prove helpful.
- Take advantage of training programs to become more familiar with the floodplain and habitat protection regulations presented here.



This graphic shows the relative locations of the floodway, riparian habitat zone, and the channel migration area, the determinants of the Protected Area. The Regulatory Floodplain includes all of the SFHA and all of the Protected Area. Enforcing this ordinance throughout the Regulatory Floodplain is needed to comply with the Endangered Species Act. A community can receive CRS credit if the Regulatory Floodplain extends beyond the SFHA.

Source: Pierce County, 2007, GeoEngineers, 2005; USDA, 2006 (Air Photo)


Permit Processing Flow Chart
Is the project in the Regulatory Floodplain? (Section 3)
YES
NO
Does the project qualify as "development?" (Sections 2, 7.1)
NO
YES
Can the project meet the general development requirements in Section 5?
NO
YES
Does the project involve construction, repairs, or improvements to a building in the Regulatory Floodplain?
YES
NO
Can the project meet the standards for protection of structures in Section 6?
NO
YES
Is the project exempt from addtional analyses and assessments? (Section 7.2)
YES
NO
Prepare the Habitat Assessment Per Section 7.7
Does the project have an adverse impact?
NO
YES
Prepare the Habitat Mitigation Plan Per Section 7.8
Redesign the project or the mitigation measures
Redesign the project to incorporate the plan's mitigation measures
Obtain all required permits. Proceed with the project.

Ordinance Language	Commentary

Model Ordinance

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

Section 1. General

1.1. Statutory Authorization

All language is optional, unless noted in the commentary as an NFIP requirement ("44 CFR…."), an ESA requirement ("ESA requirement (RPA….") or Washington state law ("WAC…").

The Legislature of the State of Washington 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:

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 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. When floodplains and watersheds are developed without taking appropriate care and precautions, flood heights, frequencies, and velocities increase, causing a greater threat to humans, damage to property, destruction of natural floodplain functions, and adverse impacts to water quality and habitat.

C. Rivers, streams, lakes, estuarine and marine areas and their floodplains are major elements of healthy aquatic and riparian habitats and conveyance of flood waters. If water-sheds, rivers, streams, lakes, estuaries, floodplains and other systems are not viewed holistically as biological and geomorphologic units, it can lead to serious degradation of habitat and increased flood hazards to people and human development.

D. Over the years, natural processes have evolved that manage flood waters and channel flows in the most effective and efficient manner. Disruption of these processes by altering land cover, stream channels, wetlands, and other water bodies leads to increased flood hazards, loss of life and property, threats to public health, and loss of habitat.

Ordinance Language	Commentary
1.3. Purpose It is the purpose of this ordinance to promote the public health, safety, and general welfare by managing development in order to: A. Protect human life, health and property from the dangers of flooding; B. Minimize the need for publicly funded and hazardous rescue efforts to save those who are isolated by flood waters; C. Minimize expenditure of public money for costly flood damage repair and flood control projects; D. Minimize disruption of commerce and governmental services; E. Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in the floodplain; F. Maintain a stable tax base by providing for the sound use of floodprone areas so as to minimize future flood blight areas; G. Encourage that those who occupy areas subject to flooding and channel migration assume responsibility for their actions; H. Qualify the *(community name)* for participation in the National Flood Insurance Program, thereby giving citizens and businesses the opportunity to purchase flood insurance; I. Maintain the quality of water in rivers, streams, lakes, estuaries, and marine areas and their floodplains so as to protect public water supplies, areas of the Public Trust, and wildlife habitat protected by the Endangered Species Act; J. Retain the natural channel, shoreline, and floodplain creation processes and other natural floodplain functions that protect, create, and maintain habitat for threatened and endangered species.	**ESA requirement**. By including retention of natural floodplain functions in the Statement of Purpose, the ordinance protects threatened and endangered species and their habitat and habitat forming processes.

Ordinance Language	Commentary
K. Prevent or minimize loss of hydraulic, geomorphic, and ecological functions of floodplains and stream channels.	**ESA requirement.** Protecting hydraulic, geomorphic, and ecological functions are essential to critical habitat for ESA protected species. Protecting hydraulic and geomorphic functions also protects life and property.
1.4. Lands to Which This Ordinance Applies This ordinance shall apply to the Regulatory Floodplain, which is comprised of the Special Flood Hazard Area and all Protected Areas within the jurisdiction of *(community name)*, as defined in Section 3.	As noted in the graphic on page iv, there may be locations where part of the Protected Area lies outside the SFHA. The ordinance needs to be enforced in such areas in order to comply with the Endangered Species Act. To simplify terminology, "Regulatory Floodplain" is used to define both areas. NFIP/CRS CRS credit is provided where floodplain management regulations are extended beyond the SFHA shown on the FIRM under Section 411.a.
1.5. Approach In order to achieve the listed purposes, this ordinance: A. Defines and clarifies the terms and phrases used in this ordinance in Section 2. B. Identifies in Section 3 the Regulatory Floodplain, the Special Flood Hazard Area, and the Protected Area and the supporting technical data needed to delineate those areas. C. Establishes a permit requirement in Section 4 so that all human development that may affect flood hazards, water quality, and habitat are reviewed before it is constructed. D. Sets minimum protection standards in Section 5 for all development to ensure that the development will not increase the potential for flood damage or adversely affect natural floodplain functions.	

Ordinance Language	Commentary
E. Sets minimum standards to protect new and substantially improved structures from flood damage in Section 6.	
F. Specifies additional habitat protection criteria in Section 7. Some small projects do not need a permit. For all other development projects, the applicant must assess their impact on those factors that contribute to increased flood hazard and degradation of habitat. If the assessment concludes that the project will cause an adverse effect outside the Protected Area, the permit will be denied unless the project impacts are mitigated (avoid, rectified or compensated).	
1.6. 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 $1,000 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. Each violation or each day of continued unlawful activity shall constitute a separate violation.	The community's legal counsel 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. Communities may want to set higher penalties after consulting with their legal counsel.
1.7. Interpretation	
In the interpretation and application of this ordinance, all provisions shall be:	
A. Considered as minimum requirements;	
B. Liberally construed in favor of the *(community name);* and,	
C. Deemed neither to limit nor repeal any other powers granted under State statutes.	

Ordinance Language	Commentary
1.8. 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. **1.9. Warning and Disclaimer of Liability** The degree of property and habitat protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods and movement 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 regulated areas or development permitted within such areas will be free from flood or erosion damage. This ordinance shall not create liability on the part of *(community name)* or any officer or employee thereof for any damage to property or habitat that result from reliance on this ordinance or any administrative decision lawfully made hereunder. **1.10. 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.	

Ordinance Language	Commentary
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 its most reasonable application.	Most of the definitions in this section are taken from 44 CFR 59.1
Adversely affect/Adverse effect: 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 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 is also likely to cause some adverse effects, then the proposed action is considered to result in an adverse effect.	This definition is taken from the USFWS/NMFS ESA Section 7 Consultation Handbook, March 1998. The term "take" is discussed further in the Handbook.
Appurtenant structure: A structure which is on the same parcel of property as the principle structure to be insured and the use of which is incidental to the use of the principle structure.	44 CFR 59.1 definition
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"). The area subject to the base flood is the Special Flood Hazard Area designated on Flood Insurance Rate Maps as Zones "A" or "V" including AE, AO, AH, A1-99 and VE.	See also the definitions under "Zone."
Base Flood Elevation: the elevation of the base flood above the datum of the effective FIRM.	
Basement: any area of the structure having its floor sub-grade (below ground level) on all sides.	
Channel Migration Zone: the area within the lateral extent of likely stream channel movement due to stream bank destabilization and erosion, rapid stream incision, aggradation, avulsions, and shifts in location of stream channels.	**ESA requirement**. See Section 3.4.D on channel migration area mapping and *Regional Guidance for Hydrologic and Hydraulic Studies* (see Appendix A).

Ordinance Language	Commentary
Critical Facility: a facility necessary to protect the public health, safety and welfare during a flood. Critical facilities include, but are not limited to, schools, nursing homes, hospitals, police, fire and emergency operations installations, water and wastewater treatment plants, electric power stations, and installations which produce, use, or store hazardous materials or hazardous waste (other than consumer products containing hazardous substances or hazardous waste intended for household use).	NFIP/CRS CRS credit is provided for setting higher protection standards for critical facilities (Section 5.4).
Development: any man-made change to improved or unimproved real estate in the Regulatory Floodplain, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, storage of equipment or materials, subdivision of land, removal of more than 5% of the native vegetation on the property, or alteration of natural site characteristics.	The last two phrases are an **ESA requirement** to ensure that any action that might harm habitat is subject to the ordinance (Biological Opinion Appendix 4, footnote 23).
Dry Floodproofing: any combination of structural and non-structural measures that prevent flood waters from entering a structure.	
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
FEMA: the Federal Emergency Management Agency, the agency responsible for administering the National Flood Insurance Program.	
Fish and Wildlife Habitat Conservation Area: lands needed to maintain species in suitable habitats within their natural geographic distribution so that isolated subpopulations are not created. These areas are designated by the *(community name)* pursuant to the Washington State Growth Management Act (WAC 365-190-080).	Fish and wildlife habitat conservation areas are designated by local governments pursuant to the Growth Management Act. They should include waters of the state (i.e., Type S streams and shorelines), habitats for species that are endangered, threatened, or of local importance, and natural area preserves. The community should have a list of designated habitat conservation areas and/or criteria for designating them.

Ordinance Language	Commentary
Flood or Flooding: a general and temporary condition of partial or complete inundation of normally dry land areas from: A. The overflow of inland or tidal waters, and/or B. The unusual and rapid accumulation of runoff of surface waters from any source.	
Flood Insurance Rate Map (FIRM): the official map on which the Federal Emergency Management Agency has delineated both the Special Flood Hazard Areas and the risk premium zones applicable to the community.	A Digital FIRM or "DFIRM" is considered a FIRM.
Flood Protection Elevation (FPE): the elevation above the datum of the effective FIRM to which new and substantially improved structures must be protected from flood damage.	"Freeboard" is the term for requiring additional protection above the base flood elevation. The community establishes how much freeboard it wants when it sets the FPE in Section 3.3.D NFIP/CRS CRS credit is provided for freeboard under Section 431.a.
Flood Insurance Study: the official report provided by the Federal Emergency Management Agency that includes flood profiles, the Flood Insurance Rate Map, and the water surface elevation of the base flood.	
Floodway: the channel of a stream 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 _(*optional desired freeboard amount*)___ foot at any point.	See Sections 3.3.E and 3.5.D on mapping floodways. NFIP/CRS See page 3-17 in *Floodplain Management Requirements*, FEMA 480, for more information on floodway mapping. The NFIP 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.

Ordinance Language	Commentary
Functionally Dependant Use: a use that must be located or carried out close to water, e.g. docking or port facilities necessary for the unloading of cargo or passengers or shipbuilding and ship repair.	
Historic Structure: a structure that A. Is listed on the National Register of Historic Places, the Washington Heritage Register, or the Washington Heritage Barn Register, or B. Has been certified to contribute to the historical significance of a registered historic district.	If the community has an historic preservation program that has been certified by the Washington Department of Archeology and Historic Preservation, then the following can be added at the end of section A "or the *(community name)'s* [name of the local program's list of historic sites]." Section B can be omitted if the community has no registered historic districts.
Hyporheic Zone: a saturated layer of rock or sediment beneath and/or adjacent to a stream channel that contains some proportion of channel water or that has been altered by channel water infiltration.	For more information, see Bolton and Shellberg, *Ecological Issues in Floodplains and Riparian Corridors* (see Appendix A).
Impervious Surface: a hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater.	**ESA requirement** (Biological Opinion Appendix 4, footnote 24). This definition is taken from the Department of Ecology's *Stormwater Management Manual for Western Washington.*
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 structure's lowest floor, provided that such enclosure is compliant with Section 6.2.F, (i.e. provided there are adequate openings to allow floodwaters into the area).	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*.
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."	
Manufactured Home Park or Subdivision: a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.	

Ordinance Language	Commentary
Native Vegetation: plant species that are indigenous to the community's area and that reasonably could be expected to naturally occur on the site.	
Natural Floodplain Functions: the contribution that a flood-plain makes to support habitat, including, but not limited to providing flood storage and conveyance, reducing flood velocities, reducing sedimentation, filtering nutrients and impurities from runoff, processing organic wastes, moderating temperature fluctuations, and providing breeding and feeding grounds, shelter, and refugia, for aquatic or riparian species	
New Construction: structures for which the "start of construction" commenced on or after the effective date of this ordinance.	
Protected Area: the lands that lie within the boundaries of the floodway, the riparian habitat zone, and the channel migration area. Because of the impact that development can have on flood heights and velocities and habitat, special rules apply in the Protected Area.	See the explanation in the Introduction and the definitions for these three areas. The Protected Area includes all three areas. It would facilitate administration of this ordinance if each of the three component areas were plotted on a map (see Sections 3.3.E, 3.3.F, and 3.4). NFIP/CRS There may be places where portions of the Protected Area are outside the SFHA. Enforcing this ordinance in those places is needed to comply with the Endangered Species Act and is eligible for CRS credit under Section 411.a.
Recreational Vehicle: a vehicle, A. Built on a single chassis; and B. 400 square feet or less when measured at the largest horizontal projection; and C. Designed to be self-propelled or permanently towable by an automobile or light duty truck; and D. Designed primarily for use as temporary living quarters for recreational, camping, travel, or seasonal use, not as a permanent dwelling.	

Ordinance Language	Commentary
Regulatory Floodplain: the area of the Special Flood Hazard Area plus the Protected Area, as defined in Section 3. The term also includes newly designated areas that are delineated pursuant to Section 3.5.	Note that there may be portions of the Protected Area, outside the SFHA, that are subject to the requirements of this ordinance.
Riparian: Of, adjacent to, or living on, the bank of a river, lake, pond, ocean, sound, or other water body.	
Riparian Habitat Zone: the water body and adjacent land areas that are likely to support aquatic and riparian habitat as detailed in Section 3.4.C of this ordinance.	The term "riparian habitat zone" is used in this ordinance to differentiate the regulated area from a "riparian buffer zone," which has a specific meaning under Washington state law.
SFHA: Special Flood Hazard Area.	
Special Flood Hazard Area: the land subject to inundation by the base flood. Special Flood Hazard Areas are designated on Flood Insurance Rate Maps with the letters "A" or "V" including AE, AO, AH, A1-99 and VE. The Special Flood Hazard Area is also referred to as the area of special flood hazard or SFHA.	
Start of Construction: includes substantial improvement, and means the actual start of construction, repair, reconstruction, rehabilitation, addition, placement or other improvement that occurred before the permit's expiration date. The actual start is 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 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 structures 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 other structural part of a building, whether or not that alteration affects the external dimensions of the building.	

Ordinance Language	Commentary
Structure: a walled and roofed building, including a gas or liquid storage tank that is principally above ground.	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.
Substantial Damage: damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. Substantial damage also means flood-related damage sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25% of the market value of the structure before the damage occurred.	This second paragraph is **optional** to help trigger Increased Cost of Compliance claim payments for repetitively flooded properties and can receive CRS credit under Section 431.c. This is explained more in *CRS Credit for Higher Regulatory Standards.*
Substantial Improvement: any repair, reconstruction, rehabilitation, addition, replacement, 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 include 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 enforcement official and which are the minimum necessary to assure safe living conditions.	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.*
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.	

Ordinance Language	Commentary
Water Typing: a system for classifying water bodies according to their size and fish habitat characteristics. The Washington Department of Natural Resources' Forest Practices Water Typing classification system is herby adopted by reference. The system defines four water types: A. Type "S" = Shoreline: Streams that are designated "shorelines of the State," including marine shorelines B. Type "F" = Fish: Streams that are known to be used by fish or meet the physical criteria to be potentially used by fish. C. Type "Np" = Non-Fish Perennial streams D. Type "Ns" = Non-Fish Seasonal streams	For more information on water typing and a map that designates the types of the major streams of the State, see www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx
Zone: one or more areas delineated on the FIRM. The following zones may be used on the adopted FIRM. The Special Flood Hazard Area is comprised of the A and V Zones. – A: SFHA where no base flood elevation is provided. – A#: numbered A Zones (e.g., A7 or A14), SFHA with a base flood elevation. – AE: SFHA with a base flood elevation. – AO:. SFHA subject to inundation by shallow flooding usually resulting from sheet flow on sloping terrain, with average depths between one and three feet. Average flood depths are shown. – AH: SFHA subject to inundation by shallow flooding (usually areas of ponding) with average depths between one and three feet. Base flood elevations are shown. – B: the area between the SFHA and the 500-year flood of the primary source of flooding. It may also be an area with a local, shallow flooding problem or an area protected by a levee. – C: an area of minimal flood hazard, as above the 500-year flood level of the primary source of flooding. B and C Zones may have flooding that does not meet the criteria to be mapped as a Special Flood Hazard Area, especially ponding and local drainage problems. – D: area of undetermined but possible flood hazard. – V: the SFHA subject to coastal high hazard flooding including waves of 3' or greater in height. There are three types of V Zones: V, V#, and VE, and they correspond to the A Zone designations. – X: the area outside the mapped SFHA. – Shaded X: the same as a Zone B, above.	A#, V#, B, and C Zones were used on earlier FIRMs. More recent FIRMs show AE, VE, X, and shaded X Zones. The zones not shown on the community's FIRM may be omitted from this definition.

Ordinance Language	Commentary
Section 3. Regulatory Data	
3.1. Regulatory Floodplain The Regulatory Floodplain is comprised of the Special Flood Hazard Area and all Protected Areas within the jurisdiction of *(community name)*. The term also includes areas delineated pursuant to Section 3.5.	As noted in the graphic on page iv, there may be locations where part of the Protected Area lies outside the SFHA. The ordinance needs to be enforced in such areas in order to comply with the Endangered Species Act. 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 3.5) exceed FEMA's mapping criteria.
3.2. Special Flood Hazard Area A. The Special Flood Hazard Area (SFHA) is the area subject to flooding by the base flood and subject to the provisions of this ordinance. It is identified by the Federal Emergency Management Agency in a scientific and engineering report entitled "Flood Insurance Study for (*__community or county name__*) " dated (___), (*20__*), and any revisions thereto, with an accompanying Flood Insurance Rate Map (FIRM) for (*__community or county name__*) " dated (___), (*20__*), and any revisions thereto, 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__*).	**44 CFR 60.3(c)(1)(d)(2)** The phrase "and any revisions thereto" is optional. The community's legal counsel should advise 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. The Washington State Attorney General has approved language that allows automatic adoption of map revisions.
B. Upon receipt of a floodplain development permit application, the *(floodplain administrator)* shall compare the elevation of the site to the base flood elevation. A development project is not subject to the requirements of this ordinance if it is located on land that can be shown to be 1. Outside the Protected Area and 2. Higher than the base flood elevation. The *(floodplain administrator)* shall inform the applicant that the project may still be subject to the flood insurance purchase requirements unless the owner receives a Letter of	Applicants should keep in mind that though this is outside FEMA's authority, there still could be adverse effects to listed species that should be addressed. See Sections 4.1 and 4.2 on floodplain development permit applications and Sections 4.4 and 4.5 on the "floodplain administrator."

Ordinance Language	Commentary
Map Amendment from FEMA.	
	The Protected Area is defined by horizontal measurements and the SFHA is defined by the base flood elevation. To be exempt from *all* aspects of this ordinance, a project in the Regulatory Floodplain must be beyond the horizontal measurements (outside the Protected Area) *and* higher than the base flood elevation. A project in the Regulatory Floodplain on a site that is above the base flood elevation, but in the Protected Area, 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 Regulatory Floodplain, the SFHA and the Protected Area (e.g., where there appears to be a conflict between the mapped SFHA boundary and actual field conditions as determined by the base flood elevation and ground elevations). The applicant may appeal the *(floodplain administrator's)* interpretation of the location of the boundary to *(name of appeals board).*	
3.3. Flood Hazard Data	
A. The base flood elevation for the SFHAs of *(community name)* shall be as delineated on the 100-year flood profiles in the Flood Insurance Study for (*community or county name).*	
B. The base flood elevation for each SFHA delineated as a "Zone AH" or "Zone AO" shall be that elevation (or depth) delineated on the Flood Insurance Rate Map. Where base flood depths are not available in Zone AO, the base flood elevation shall be considered to be two feet above the highest grade adjacent to the structure.	**44 CFR 60.3(c)(7)**
C. The base flood elevation for all other SFHAs shall be as defined in Sections 3.3.F and 3.5.C.	

Ordinance Language	Commentary
D. The Flood Protection Elevation (FPE) shall be the base flood elevation plus one foot.	**"Plus one foot" is optional**, but highly recommended. FEMA standards require the lowest floor to be elevated "to or above" the base flood elevation; however, adding an additional one or two feet of free-board increases safety and may reduce insurance premiums by up to 60% . See also www.mass.gov/czm/stormmart/regulations/freeboard.htm NFIP/CRS 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 as delineated on the Flood Insurance Rate Map or in accordance with Sections 3.3.F and 3.5.D.	Communities with older Flood Boundary Floodway Maps still in effect need to adopt their Flood Boundary Floodway Maps, not the FIRM.
F. Where base flood elevation and floodway data have not been provided in Special Flood Hazard Areas, the (*flood-plain administrator*) shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a Federal, State, or other source.	**44 CFR 60.3(b)(4)**. Note that data in a draft or preliminary FIRM may be used as explained in FEMA's Floodplain Management Bulletin 1-98 *Use Of Flood Insurance Study (FIS) Data As Available Data.* NFIP/CRS 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. Protected Area A. The Protected Area is comprised of those lands that lie within the boundaries of the floodway, the riparian habitat zone, and the channel migration area. B. In riverine areas, where a floodway has not been designated in accordance with Sections 3.3.E, 3.3.F, or 3.5.D, the Protected Area is comprised of those lands that lie within the boundaries of the riparian habitat zone, the channel migration area, and the SFHA.	NFIP/CRS There may be places where portions of the Protected Area are outside the SFHA. Enforcing this ordinance in those places would ensure some level of compliance with the Endangered Species Act and is eligible for CRS credit under Section 411.a.

Ordinance Language	Commentary
C. Riparian habitat zone: The riparian habitat zone includes those watercourses within the SFHA and adjacent land areas that are likely to support aquatic and riparian habitat.	**ESA requirement (Biological Opinion Appendix 4, Section 1 and RPA.3.A).** The Biological Opinion uses "riparian buffer zone," but in this ordinance the zone designates an area where certain limited activities can occur. Generally it is an area that must be kept as open space.
1. The size and location of the riparian habitat zone is dependent on the type of water body. The riparian habitat zone includes the water body and adjacent lands, measured perpendicularly from ordinary high water on both sides of the water body: (a) Type S streams that are designated "shorelines of the State:" 250 feet (b) Type F streams (fish bearing) streams greater than 5 feet wide and marine shorelines: 200 feet (c) Type F streams less than 5 feet wide and lakes: 150 feet (d) Type N (nonsalmonid-bearing) perennial and seasonal streams with unstable slopes: 225 feet (e) All other Type N (nonsalmonid-bearing) perennial and seasonal streams: 150 feet	The dimensions were set by the Biological Opinion and came from Washington Department of Fish and Wildlife. Areas with unstable slopes or mass wasting are more likely to have slumping or landslides, so a larger overbank area needs to be protected. For more information, see *Management Recommendations for Washington's Priority Habitats – Riparian* at http:// wdfw.wa.gov/hab/ripxsum.htm)
2. The riparian habitat zone 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.	See also Section 4.2.A on the requirements for a site plan with the permit application.
D. Channel Migration Area: 1. The channel migration area shall be the channel migration zone as delineated on *(name of map that has been adopted for local regulatory purposes) plus 50 feet.* 2. Where more than one channel migration zone has been delineated, the *(floodplain administrator)* shall use the delineation that has been adopted for other local regulatory purposes. 3. Where a channel migration zone has not yet been mapped, the provisions of Section 3.5.E shall apply at the time of permit application.	If there is no channel migration zone map that has been adopted by *(community name)* for regulatory purposes, channel migration zones need to be mapped and regulated in accordance with the Washington State Shorelines Management Program and this section See also the riparian management core zone criteria of the Washington Department of Natural Resources Forest Practices rules at the WDNR website (http://www.dnr.wa.gov/BusinessPermits/ForestPractices/Pages/Home.aspx). NFIP/CRS There is CRS credit for mapping and regulating channel migra-

Ordinance Language	Commentary
	tion areas. For more information, see *CRS Credit for Mapping and Managing Channel Migration Areas.* If there is more than one channel migration zone map or if the available map shows more than one zone (e.g., a low, medium, and high hazard), this ordinance should be consistent with the delineation used for other regulations. See also *Regional Guidance for Hydrologic and Hydraulic Studies* for further guidance.
3.5. New Regulatory Data	
A. All requests to revise or change the flood hazard data, including requests for a Letter of Map Revision and a Conditional Letter of Map Revision shall be reviewed by the *(floodplain administrator).*	
1. The *(floodplain administrator)* shall not sign the Community Acknowledgement Form for any requests based on filling or other development, unless the applicant for the letter documents that such filling or development is in compliance with this ordinance. 2. The *(floodplain administrator)* shall not approve a request to revise or change a floodway delineation until FEMA has issued a Conditional Letter of Map Revision that approves the change.	The community has an obligation to not approve a map revision if it is based on an illegal activity. Putting the requirement in the ordinance helps support the floodplain administrator when a LOMR or CLOMR should be denied.
B. If an applicant disagrees with the regulatory data prescribed by this ordinance, he/she may submit a detailed technical study needed to replace existing data with better data in accordance with FEMA mapping guidelines or *Regional Guidance for Hydrologic and Hydraulic Studies in Support of the Model Ordinance for Floodplain Management under the National Flood Insurance Program and the Endangered Species Act* FEMA Region X, 2010. If the data in question are shown on the published FIRM, the submittal must also include a request to FEMA for a Conditional Letter of Map Revision.	
C. Where base flood elevation data are not available in accordance with Section 3.3, applicants for approval of new subdivisions and other proposed developments (including proposals for manufactured home parks and subdivisions) greater than 50 lots or 5 acres, whichever is the lesser, shall	**44 CFR 60.3(b)(3)** NFIP/CRS The following alternative language is optional. It requires

Ordinance Language	Commentary
include such data with their permit applications.	every permit applicant, not just developers of larger projects, to provide the regulatory data. Therefore, CRS credit is provided for the following language under Section 411.a: "*Where base flood elevation data are not available in accordance with Section 3.3, applicants for approval of new subdivisions and other proposed developments shall include such data with their permit applications.*"
D. Where floodway delineation is not available in accordance with Section 3.3, the floodway will be designated to be one-half the distance of the mapped 100 year floodplain at any point, and the prohibition on floodway development adheres, unless a floodway study indicates otherwise. This provision applies to any floodplain development permit, including those for substantial improvements.	This provision can receive CRS credit under Section 411.a, as the NFIP only requires developers to provide base flood elevations, where they are not available. The NFIP's floodway mapping standard allows the water surface elevation to increase up to one foot. CRS credit is provided if increases in the base flood elevation are kept to a smaller amount. This credit is provided under the more restrictive floodway credit found in Section 411.d.
E. Where channel migration zone data are not available in accordance with Section 3.4.D, the permit applicant shall either: 1. Designate the entire SFHA as the channel migration zone or 2. Identify the channel migration area in accordance with *Regional Guidance for NFIP-ESA Floodplain Mapping*, published by FEMA Region X and dated _____.	

Ordinance Language	Commentary
F. All new hydrologic and hydraulic flood studies conducted pursuant to this Section 3.5 shall consider future conditions and the cumulative effects from anticipated future land use changes in accordance with *Regional Guidance for Hydrologic and Hydraulic Studies in Support of the Model Ordinance for Floodplain Management under the National Flood Insurance Program and the Endangered Species Act*, FEMA Region X, 2010.	**ESA requirement (RPA 2.C).** NFIP/CRS Regulatory flood studies that include future conditions can receive CRS credit under Section 411.c.

Ordinance Language	Commentary
Section 4. Administration	
4.1. Establishment of Floodplain Development Permit	**44 CFR 60.3(b)(1)** requires a permit for all development in the SFHA. There may be locations where part of a Protected Area lies outside the SFHA. The ordinance needs to be enforced in such areas in order to comply with the Endangered Species Act.
A floodplain development permit shall be obtained before construction or development begins within the Regulatory Floodplain. The permit shall be for all development as set forth in Section 2. Definitions.	The community does not need to adopt those parts of Section 4 that duplicate other ordinances' existing administrative provisions.
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 not be limited to,	Example permits are available from FEMA or DOE and in Section 7 of *NFIP Floodplain Management Requirements*, FEMA 480.
A. One or more site plans, drawn to scale, showing:	See also Sections 5.1 and 5.2. on subdivision and site design requirements.
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,	The site plan needs to show all riparian habitat zones that affect the site, including those measured from water bodies outside the property.
3. The elevations of the 10-, 50-, 100-, and 500-year floods, where the data are available,	**ESA requirement (Biological Opinion Appendix 4, Section 3.4),** where such data are available, such as a Flood Insurance Study profile.
4. The boundaries of the Regulatory Floodplain, SFHA, floodway, riparian habitat zone, and channel migration area, delineated in accordance with Section 3,	
5. The proposed drainage system including, but not limited to storm sewers, overland flow paths, detention facilities and roads,	
6. Existing and proposed structures, fill, pavement and other impervious surfaces, and sites for storage of materials,	

Ordinance Language	Commentary
7. All wetlands,	Wetlands are subject to other local, State and Federal 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.
8. Designated fish and wildlife habitat conservation areas, and habitat areas identified for conservation or protection under state or federal or local laws or regulations (e.g: Endangered Species Act, Magnuson-Stevens Fishery Conservation and Management Act, Growth Management Act, Shorelines Management Act, Priority Habitat and Species List,	See the definition of fish and wildlife habitat conservation areas. The community may want to add other designated sensitive areas.
9. Existing native vegetation and proposed revegetation.	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.	
C. 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 Flood Protection Elevation for the building site and the proposed elevations of the following:	
1. The top of bottom floor (including basement, crawlspace, or enclosure floor)	Item 3) is only required in coastal high hazard areas and may be omitted in communities with no V Zones.
2. The top of the next higher floor	
3. The bottom of the lowest horizontal structural member (in V Zones only)	
4. The top of the slab of an attached garage	
5. The lowest elevation of machinery or equipment servicing the structure	This list is the same information required for a FEMA Elevation Certificate. The instructions and diagrams on the Certificate can help clarify where these elevations are to be shot.
6. The lowest adjacent (finished) grade next to structure	
7. The highest adjacent (finished) grade next to structure	
8. The lowest adjacent grade at the lowest elevation of a deck or stairs, including structural support	

Ordinance Language	Commentary
D. 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 and 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.	
E. The proposed project must be designed and located so that new structural flood protection is not needed	**ESA requirement (RPA 3.A.3.b, Appendix 4, Section 3.8)**.
F. The application shall include a description of the extent to which a stream, lake, or other water body, including its shoreline, will be altered or relocated as a result of the proposed development.	Bank stabilization measures along salmonid-bearing streams, channel migration zones, and along estuarine and marine shorelines must be minimized to the maximum extent possible. If bank stabilization measures are necessary, bioengineered armoring of streambanks and shorelines must be used (per the Integrated Streambank Protection Guidelines 2003 (for riverine shorelines) or the State Shorelines Guidelines on bank stabilization (2003) (for estuarine and marine shorelines).**ESA requirement (RPA 3.A.3.b, Appendix 4, Section 3)**.
G. The application shall include documentation that the applicant will apply for all necessary permits required by Federal, State, or local law. The application shall include written acknowledgment 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 permit is not valid if those other permits and approvals are not obtained prior to any ground disturbing work or structural improvements.	**44 CFR 60.3(a)(2)** See also Section 4.7.A.3. Many communities have developed their own checklists showing what permits are required for different areas and different types of projects. Help doing this may be available from the Governor's Office of Regulatory Assistance (www.ora.wa.gov).
H. 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.	

Ordinance Language	Commentary
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*)	**44 CFR 59.22(b)(1)**
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.	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 those local, State or Federal permits that may be required to assure compliance with the Endangered Species Act and/or other appropriate State or Federal 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 Protected Area. If located in the Protected Area, ensure that the provisions of Section 7 are met.	
D. Ensure that all development activities within the Regulatory Floodplain of the jurisdiction of the *(community name)* meet the requirements of this ordinance.	

Ordinance Language	Commentary
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) and ESA requirement (Biological Opinion Appendix 4, Section 4)**
G. Submit reports as required for the National Flood Insurance Program.	
H. Notify FEMA of any proposed amendments to this ordinance.	
I. Cooperate with State and Federal agencies to improve flood and other technical data and notify FEMA of any new data that would revise the FIRM.	
4.6. Records	**44 CFR 60.3(b)(5)(i) and (iii)**
A. Where base flood elevation data have been obtained pursuant to Sections 3.3 and 3.5, 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), signed and sealed by a professional land surveyor, currently licensed in the State of Washington.	See also Section 4.7.A.1. NFIP/CRS Use of the FEMA Elevation Certificate form is optional, except for CRS communities. It is a very useful form that helps ensure full compliance with the ordinance and it is needed for the owner to obtain a flood insurance policy.
B. For all new or substantially improved dry floodproofed nonresidential structures, where base flood elevation data has been obtained pursuant to Sections 3.3 and 3.5, 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), professional engineer, currently licensed in the State of Washington	**44 CFR 60.3(b)(5)(ii) and (iii).** See also Sections 4.2.D, 4.7.A.1, and 6.3.D. NFIP/CRS Use of the FEMA Floodproofing Certificate is optional, except for CRS communities. It is a very useful form that helps ensure full compliance with the ordinance and it is needed for the owner to obtain a flood insurance policy.

Ordinance Language	Commentary
4.7. Certificate of Occupancy	It is a good practice to hold on to the certificate of use or occupancy until all the required paperwork is supplied by the builder. If the certificate of use or occupancy is issued by another office, procedures would be needed to make sure the floodplain administrator is contacted before one is issued. Some communities call this step a sign off on the final inspection. The terms used in this ordinance should be consistent with the rest of the community's development regulations.
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 finished construction data as required by Section 4.6;	Obtaining an "as built" or finished construction Elevation Certificate or Floodproofing Certificate is a requirement for CRS communities.
2. If a mitigation plan is required by Sections 7.7 and 7.8, all work identified in the plan has been completed according to the plan's schedule;	
3. The applicant provides copies of all required Federal, State, and local permits noted in the permit application per Section 4.2.F ;	
4. 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 property 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 appeal/hearings examiner/ etc…)____ as established by ___(board of appeal/hearings examiner/ etc…)____ shall hear and decide appeals and requests for variances from the requirements of this ordinance.	This section is not needed if the community already has a board, commission, or hearing examiner to review appeals and variances applicable to this ordinance.
B. The ___(board of appeal/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.	

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C. Those aggrieved by the decision of the __(board of appeal/hearings examiner/ etc…)____ may appeal such decision to the ___(board of appeal/hearings examiner/ etc…)____.	
D. Upon consideration of the factors of Section 4.9 and the purposes of this ordinance, the _(board of appeal/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 the Federal Emergency Management Agency upon request.	
4.9. Variance Criteria	
A. In reviewing applications for a variance , the __(board of appeal/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 safety of access to the property in times of flood for ordinary and emergency vehicles;	
4. 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;	**44 CFR 60.6(a)(1-7)**
5. The susceptibility of the proposed facility and its contents to flood or erosion damage and the effect of such damage on the individual owner;	Communities are encouraged to adopt standards equal to or more restrictive than **44 CFR 60.6(a)(1-7)** 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).**
6. The availability of alternative locations for the proposed use which are not subject to flooding or channel migration and are not in designated fish and wildlife habitat conservation areas;	
7. The relationship of the proposed use to the comprehensive plan, growth management regulations, critical area regulations, the shoreline management program, and floodplain management program for that area;	
8. 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;	

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9. The potential of the proposed development project to destroy or adversely affect a fish and wildlife habitat conservation area or create an adverse effect to federal, state or locally protected species or habitat; and	
10. The potential of the proposed development project to affect, or be affected by, channel migration; and	
12. Is the minimum necessary to grant relief; and	
13. Must be compliant with the ESA	
B. No variance shall be granted to the requirements of this ordinance unless the applicant demonstrates that:	
1. The development project cannot be located outside the Regulatory Floodplain;	
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;	If the issue is not specific to the property, but is a problem faced by other properties, the remedy should be a revision to the ordinance rather than a variance.
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 local, state or federally protected fish or wildlife;	Features or quality of habitat may include but is not limited to water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refugia
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,	

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building or structure; and	
2. The repair or rehabilitation will not result in the site, building or structure losing its historic designation.	
D. Variances may be requested for new construction, substantial improvements, and other development necessary for the conduct of functionally dependant 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 and their habitat.	
E. Variances to the provisions of Section 6 of this ordinance may be issued for a structure on a small or irregularly shaped lot contiguous to and surrounded by lots with existing structures constructed below the FPE, providing the other variance criteria are met. The applicant for such a variance shall be notified, in writing, that the structure (i) will be subject to increased premium rates for flood insurance up to amounts as high as $25 for $100 of insurance coverage and (ii) such construction below the FPE increases risks to life and property. Such notification shall be maintained with a record of all variance actions.	**44 CFR 60.6(a)(5)**
F. 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.	

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Section 5. General Development Standards	
The provisions of this Section 5 shall apply in the Regulatory Floodplain:	There may be locations where part of a Protected Area lies outside the SFHA. The ordinance needs to be enforced in such areas in order to comply with the Endangered Species Act.
5.1. Subdivisions This section applies to all subdivision proposals, short subdivisions, short plats, planned developments, and new and expansions to manufactured housing parks.	The community needs to make sure this section is consistent with its subdivision regulations or it may want to incorporate these provisions into its subdivision ordinance.
A. All proposals shall be consistent with the need to minimize flood damage.	**44 CFR 60.3(a)(4)**
B. The proposed subdivision should have one or more new lots in the Regulatory Floodplain set aside for open space use through deed restriction, easement, subdivision covenant, or donation to a public agency. The density of the development in the portion of the development outside the Regulatory Floodplain may be increased to compensate for the amount of land in the Regulatory Floodplain preserved as open space in accordance with _____*(section of the community's zoning or other development ordinance that allows PUDs and/or transfers of development rights).*	**ESA Requirement: RPA 4.B and Appendix 4, Section 3.11** call for preserving floodplain open space via cluster development, planned unit developments and other methods, wherever possible. Communities may want to put this language in their zoning or subdivision ordinance. NFIP/CRS 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.
C. If a parcel has a buildable site outside the Regulatory Floodplain, it shall not be subdivided to create a new lot, tract, or parcel within a binding site plan that does not have a buildable site outside the Regulatory Floodplain. This provision does not apply to lots set aside from development and preserved as open space.	
D. All proposals shall have utilities and facilities, such as sewer, gas, electrical, and water systems located and constructed to minimize or eliminate flood damage.	

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E. All proposals shall ensure that all subdivisions have at least one access road connected to land outside the Regulatory Floodplain with the surface of the road at or above the FPE wherever possible.	This section is optional, but recommended by FEMA. CRS credit is provided under Section 431.i.
F. All proposals shall have adequate drainage provided to avoid exposure to water damage.	
G. The final recorded subdivision plat shall include a notice that part of the property is in the SFHA, riparian habitat zone and/or channel migration area, as appropriate.	**ESA requirement (Biological Opinion Appendix 4, Section 3.9)** Five points of CRS credit is provided for requiring such a notice to be filed with the subdivision plat, under Section 341.c.
5.2. Site Design	This section has requirements from the ESA Biological Opinion, most of which receive CRS credit.
A. Structures and other development shall be located to avoid flood damage.	
1. If a lot has a buildable site out of the Regulatory Floodplain, all new structures shall be located in that area, when possible.	**ESA requirement (Appendix 4, Sections 3.1 and 3.11)**. Section 5.1 addresses new subdivisions, encouraging developers to avoid putting new buildable lots in the floodplain. Section 5.2 covers existing lots.
2. If a lot does not have a buildable site out of the Regulatory Floodplain, all new structures, pavement, and other development must be sited in the location that has the least impact on habitat by locating the structures as far from the water body as possible or placing the structures on the highest land on the lot	
3. A minimum setback of 15 feet from the Protected Area shall be required for all structures	CRS credit is provided under Section 431LD.a.2.
4. If the proposed project does not meet the criteria of Sections 5.2.A and B, a habitat impact assessment shall be conducted pursuant to Section 7.7 and, if necessary, a habitat mitigation plan shall be prepared and implemented pursuant to Section 7.8.	
B. All new development shall be designed and located to minimize the impact on flood flows, flood storage, water quality, and habitat.	
1. Stormwater and drainage features shall incorporate low impact development techniques, if technically feasible, that mimic pre-development hydrologic conditions, such as stormwater infiltration, rain gardens, grass swales, filter strips, disconnected impervious areas,	**ESA CRS recommendation (RPA 4.A)** The objective of low impact development is to reduce the volume of

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permeable pavement, and vegetative roof systems.	stormwater runoff and reduce pollutant concentrations. The full benefit of these techniques is seen when they are applied throughout the watershed, not just in the floodplain. For more information on low impact development, see Appendix A. CRS credit is provided under Section 451.e for LID stormwater management practices, if they are enforced throughout the community.
2. If the proposed project will create new impervious surfaces so that more than 10 percent of the portion of the lot in the Regulatory Floodplain is covered by impervious surface, the applicant shall demonstrate that there will be no net increase in the rate and volume of the stormwater surface runoff that leaves the site or that the adverse impact is mitigated, as provided by Sections 7.7 and 7.8.	**ESA requirement (Appendix 4, Section 3.6.).** Often low impact development techniques will fulfill this requirement. Otherwise, the applicant may need to provide a technical study that shows there will be no net increase in runoff. The technical basis for the 10% threshold can be found in "Forest Cover, Impervious-Surface Area, and The Mitigation of Stormwater Impacts" (see Appendix A).
C. The site plan required in Section 4.2 shall account for surface drainage to ensure that 1. Existing and new buildings on the site will be protected from stormwater runoff and 2. The project will not divert or increase surface water runoff onto neighboring properties.	This provision is designed to prevent the type of problem created when a new house on fill obstructs the drainage system, redirecting runoff onto another property. CRS credit of up 50 points is provided under Section 451.c for requiring all site plans (not just those in the floodplain) to account for local drainage from and onto adjoining properties and to protect new buildings from local drainage flows.
5.3. Hazardous Materials A. No new development shall create a threat to public health, public safety, or water quality. Chemicals, explosives, gasoline, propane, buoyant materials, animal wastes,	**ESA requirement (Appendix 4, Section 1)** CRS credit of 10 points is

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fertilizers, flammable liquids, pollutants, or other materials that are hazardous, toxic, or a threat to water quality are prohibited from the Regulatory Floodplain. This prohibition does not apply to small quantities of these materials kept for normal household use. This prohibition does not apply to the continued operations of existing facilities and structures, reuse of existing facilities and structures, or functionally dependent facilities or structures.	provided under Section 431.g.1(a). CRS credit is reduced if the following optional language is added at the end of the section: "or to materials kept in approved containers above the FPE or in a dry floodproofed non-residential building."
B. If the proposed project will cannot meet section 5.3(A) of this ordinance then a habitat assessment must be conducted in accordance with Sections 7.7 and 7.8.	
5.4. Critical Facilities	
A. Construction of new critical facilities shall be, to the extent possible, located outside the limits of the Regulatory Floodplain.	
B. Construction of new critical facilities in the Regulatory Floodplain shall be permissible if no feasible alternative site is available, provided	NFIP/CRS CRS credit of 50 points is provided for this language under Section 431.e). Up to 100 points is provided if the community prohibits critical facilities from all or parts of the 500-year floodplain.
1. Critical facilities shall have the lowest floor elevated three feet above the base flood elevation or to the height of the 500-year flood, whichever is higher. If there is no available data on the 500-year flood, the permit applicants shall develop the needed data in accordance with FEMA mapping guidelines.	Note that any filling needed to meet this requirement must also meet the requirements of Section 7.
2. Access to and from the critical facility shall be protected to the elevation of the 500-year flood.	
5.5. Sand Dunes	
Man-made alterations of sand dunes within Zones V1-30, VE, and V which would increase potential flood damage are prohibited.	**44 CFR 60.3(e)(7).** Communities without coastal high hazard areas may omit this section.

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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 Flood Protection Elevation.	
6.1. Applicability	**44 CFR 59.1, 60.3(c)**
This section's protection requirement applies to all new structures and substantial improvements, which include:	
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.	Section 6.1.D 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 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 non-residential buildings.
A. All new structures and substantial improvements shall have the lowest floor, including basement, elevated above the FPE.	**44 CFR 60.3(c)(2), (7), and (8)** See also Section 3.3.D on the FPE. NFIP/CRS 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. The structure shall be aligned parallel with the direction of flood flows where practicable.	**ESA requirement (Appendix 4, Section 3.1)**
C. The structure shall be anchored to prevent flotation, collapse, or lateral movement of the structure.	**44 CFR 60.3(a)(3)(i)**

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D. All materials below the FPE shall be resistant to flood damage and firmly anchored to prevent flotation. Materials harmful to aquatic wildlife, such as creosote, are prohibited below the FPE.	**44 CFR 60.3(a)(3)(ii-iv)**
E. Electrical, heating, ventilation, duct work, plumbing, and air-conditioning equipment and other service facilities shall be elevated above the FPE. Water, sewage, electrical, and other utility lines below the FPE 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)** NFIP/CRS Full CRS credit for freeboard depends on machinery, equipment and ductwork (as well as the lowest floor) to be above the freeboard level.
F. Fully enclosed areas below the lowest floor that are subject to flooding shall be used only for parking, storage, or building access and 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 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. 3. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.	**44 CFR 60.3(c)(5)** Note that fully enclosed areas are not allowed in V Zones (see Section 6.2.G.3). Insurance rates reflect an "all or nothing" standard, meaning partially ventilated crawlspaces may be subject to a higher insurance premium. NFIP/CRS An alternative to this language can receive CRS credit of up to 300 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*. 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.*
G. In Zones V, V1-30 and VE, new structures and substantial improvements shall be elevated on pilings or columns so that:	This section can be deleted for communities with no coastal high hazard area mapped as a V Zone.

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1. The bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated above the FPE.	**44 CFR 60.3(e)(4)**
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)(4)**
3. The areas below the lowest floor that are subject to flooding shall be free of obstruction.	**44 CFR 60.3(e)(5).** 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. NFIP/CRS 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)**
5. The use of fill for structural support of a structure or addition is prohibited.	**44 CFR 60.3(e)(6)**
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)**
6.3. Nonresidential Construction	
New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall be elevated in accordance with Section 6.2. As an alternative to elevation, a new or substantial improvement to a nonresidential structure and its attendant utility and sanitary facilities, may be dry floodproofed in A Zones. The project must meet the following:	**44 CFR 60.3(c)(3) and (8)**
A. The structure is not located in Zones V, V1-30, or VE; and	
B. Below the FPE the structure is watertight with walls substantially impermeable to the passage of water; and	

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C. The structural components are capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and	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.
D. The plans are certified by a registered professional engineer or licensed 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. Such certifications shall be provided to the *(floodplain administrator)* as set forth in Sections 4.6.B and 4.7.A.1.	**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. FEMA and the Department of Ecology encourage all manufactured homes to be protected to the known flood hazard, so this language is recommended. NFIP/CRS 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. Securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement. Methods of anchoring may include, but are not to be 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.	**44 CFR 60.3(b)(8).** For more detailed information, refer to FEMA-85, *Manufactured Home Installation in Flood Hazard Areas*.
6.5. Recreational Vehicles Recreational vehicles placed on sites shall: A. Be on the site for fewer than 180 consecutive days, or 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	**44 CFR 60.3(c)(14)**

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C. Meet the requirements of Section 6.4 above.	
6.6. Appurtenant Structures	
A structure which is on the same parcel of property as the principle structure and the use of which is incidental to the use of the principle structure and is not used for human habitation may be exempt from the elevation requirement of Section 6.2.A, provided:	
A. It is used only for parking or storage;	
B. It is constructed and placed on the building site so as to offer minimum resistance to the flow of floodwaters;	
C. It is anchored to prevent flotation which may result in damage to other structures;	For additional guidance, see FEMA's Technical Bulletin 7-93, *Wet Floodproofing Requirements*
D. All portions of the structure below the FPE must be constructed of flood-resistant materials;	
E. Service utilities such as electrical and heating equipment meet the standards of Sections 6.2.E and 6.7;	
F. It has openings to allow free flowage of water that meet the criteria in Section 6.2.F;	
G. The project meets all the other requirements of this ordinance, including Section 7.	
6.7. Utilities	
A. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems;	**44 CFR 60.3(a)(5)**
B. Water wells shall be located outside the floodway and shall be protected to the FPE;	**This is a requirement under the State floodway standard adopted in WAC 173-160-171**.
C. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters;	**44 CFR 60.3(a)(6)(i)**

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D. Onsite waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding. A habitat impact assessment shall be conducted in accordance with Section 7.7 as a condition of approval of an onsite waste disposal system to be located in the Regulatory Floodplain.	**44 CFR 60.3(a)(6)(ii)** The impact assessment is needed to meet an **ESA requirement (Appendix 4, Section 1)**

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Section 7. Standards for Habitat Protection The provisions of this Section shall apply in the Regulatory Floodplain.	The objective of Section 7 (Standards for Habitat Protection) is to protect habitat function. The model ordinance assumes that within the protected area habitat values remain, however, in a fully developed community, the only residual function that needs to be addressed may be flood storage and storm water discharge. If a fully developed community can document to FEMA that there are no areas that would qualify as functioning habitats it may submit alternative language. A community may also submit a study that shows where functioning habitats exist and limit this section to those areas..

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7.1. Non-Development Activities	
Activities that do not meet the definition of "development" are allowed in the Regulatory Floodplain 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 not considered development or "man-made changes to improved or unimproved real estate."	**ESA optional language (Appendix 4, Section 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 would 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 Regulatory Floodplain 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. Plowing and other normal farm practices (other than structures or filling) on farms in the Regulatory Floodplain and in existence as of the effective date of this ordinance do not require a floodplain development permit. Clearing additional land for agriculture after the date of this ordinance will require a flood plain development permit.	

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7.2. Activities Allowed With a Floodplain Permit The following activities are allowed in the Regulatory Floodplain without the analysis required in Section 7.5 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:	Everything that is not listed in Section 7.1 needs a floodplain development permit. The projects listed in this Section 7.2 are only exempt from the floodway analysis and habitat impact assessment required in Sections 7.7 and 7.8. They must still meet all the other requirements of this ordinance. For example, even if an expansion to an existing house is less than 10% of the footprint, the project is still subject to the compensatory storage requirement of Section 7.6 and must be checked to see if it is a substantial improvement (Section 6.2).
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.	
B. Expansion of an existing structure that is no greater than ten percent beyond its existing footprint, provided that the repairs or remodeling are not a substantial improvement or a repair of substantial damage. This measurement is counted cumulatively from the effective date of this ordinance or September 22, 2011 whichever is earlier. If the structure is in the floodway, there shall be no change in the dimensions perpendicular to flow.	**ESA requirement (RPA 3.A.4)**
C. Activities with the sole purpose of creating, restoring or enhancing natural functions associated with floodplains, streams, lakes, estuaries, marine areas, habitat, and riparian areas that meet Federal and State standards, provided the activities do not include structures, grading, fill, or impervious surfaces.	
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 the native vegetation on that portion of the property in the Regulatory Floodplain.	
E. Repair to onsite Septic Systems provided the ground disturbance is the minimal necessary.	
7.3. Other Activities All other activities not listed in Sections 7.1 or 7.2 that are allowed by _____ are allowed, provided they meet all the other requirements of this ordinance, including the analysis required in Section 7.5 and 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.

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7.4. Native Vegetation	
The site plan required in Section 4.2 shall show existing native vegetation.	**ESA requirement (Appendix 4, Section 3.7)**
A. In the riparian habitat zone, native vegetation shall be left undisturbed, except as provided in Sections 7.1 and 7.2.C.	Note that these criteria apply to new development projects. Ongoing maintenance of vegetation is covered by Section 7.1.A and B. Projects not covered by Sections 7.1 and 7.2 will also need a habitat impact assessment.
B. Outside the riparian habitat zone, removal of native vegetation shall not exceed 35 percent of the surface area of the portion of the site in the Regulatory Floodplain. Native vegetation in the riparian habitat zone portion of the property can be counted toward this requirement.	Keeping vegetation over 65% of the property is a standard from the Biological Opinion. Previous studies in the Puget Sound basin examining the effects of native vegetation removal from areas with common soil conditions (e.g., glacial till or riverine alluvium) have identified this percentage to be the threshold needed for effective stormwater management. See "Forest Cover, Impervious-Surface Area, and the Mitigation of Stormwater Impacts" for further discussion of forest cover and stormwater impacts.
C. If the proposed project does not meet the criteria of Sections 7.4.A and B, a habitat impact assessment shall be conducted pursuant to Section 7.7 and, if necessary, a habitat mitigation plan shall be prepared and implemented pursuant to Section 7.8.	
7.5. Floodway Standards	
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:	**44 CFR 60.3(d)(3)**
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.	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.

Ordinance Language	Commentary
2. Construction or reconstruction of residential structures is prohibited within designated floodways, except for the following. The following exceptions must still meet all other requirements in the ordinance, including Section 7.5.A.1.	**This is a requirement under the State floodway standard adopted in WAC 173-158-070.**
(a) Repairs, reconstruction, or improvements to a residential structure which do not increase the ground floor area, providing the cost of which does not exceed 50 percent of the market value of the structure either, (a) before the repair, or reconstruction is started, or (b) if the structure has been damaged, and is being restored, before the damage occurred. 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 a local code enforcement official and which are the minimum necessary to assure safe living conditions, or to an historic structure, may be excluded from the 50 percent calculations.	Note that these exceptions must still meet all the other requirements in the ordinance, including the requirement for a "no rise" certificate in Section 7.5.A.1.
(b) Repairs, replacement, reconstruction, or improvements to existing farmhouses located in designated floodways and located on designated agricultural lands that do not increase the building's total square footage of encroachment and are consistent with all requirements of WAC 173-158-075;	The criteria in WAC 173-159-075 are included in Appendix F.
(c) Repairs, replacement, reconstruction, or improvements to substantially damaged residential dwellings other than farmhouses that do not increase the building's total square footage of encroachment and are consistent with all requirements of WAC 173-158-076; or	The criteria in WAC 173-159-076 are included in Appendix F.
(d) Repairs, reconstruction, or improvements to residential structures identified as historic structures that do not increase the building's dimensions.	
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 ____ foot.	**44 CFR 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

Ordinance Language	Commentary
	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.
7.6. Compensatory Storage New development shall not reduce the effective flood storage volume of the Regulatory Floodplain. A development proposal shall provide compensatory storage if grading or other activity eliminates any effective flood storage volume. Compensatory storage shall: A. Provide equivalent volume at equivalent elevations to that being displaced. For this purpose, "equivalent elevation" means having similar relationship to ordinary high water and to the best available 10-year, 50-year and 100-year water surface profiles; B. Be hydraulically connected to the source of flooding; and C. Provide compensatory storage in the same construction season as when the displacement of flood storage volume occurs and before the flood season begins. D. The newly created storage area shall be graded and vegetated to allow fish access during flood events without creating fish stranding sites.	**ESA requirement (RPA 3.A.3.b, Appendix 4, Section 3.5)**. Communities may modify the language to exclude marine and estuarine areas where loss of storage does not affect flood heights. The requirement to compensate lost floodplain storage favors construction of buildings on elevated foundations and flow-through crawlspaces rather than slab foundations on fill. CRS credit of 70 points is provided for compensatory storage under Section 431.f.2
7.7. Habitat Impact Assessment Unless allowed under Sections 7.1 – 7.2, a permit application to develop in the Regulatory Floodplain shall include an assessment of the impact of the project on federal, state or locally protected species and habitat, water quality and aquatic	**ESA requirement (RPA 3A.2, Appendix 4, Section 1)**

Ordinance Language	Commentary
and riparian habitat. The assessment shall be: A. A Biological Evaluation or Biological Assessment developed per 50 CFR 402.12 to initiate Federal Interagency consultation under Endangered Species Act section 7(a)(2); or B. Documentation that the activity fits within Section 4(d) of the Endangered Species Act; or C. 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	Some projects require a Corps of Engineers 404 permit or may otherwise require a consultation with NMFS or the US Fish & Wildlife Service, depending on the affected species. If the appropriate agency issues a letter of concurrence, it can be considered as qualifying as a habitat impact assessment.
D. An assessment prepared in accordance with *Regional Guidance for Floodplain Habitat Assessment and Mitigation*, FEMA Region X, 2010. The assessment shall determine if the project would adversely affect: 1. Species that are Federal, state or local listed as threatened or endangered. 2. The primary constituent elements for critical habitat, when designated,	For the Puget Sound Biological Opinion the following elements must be addressed: water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refugia for listed salmonids
3. Essential Fish Habitat designated by the National Marine Fisheries Service, 4. Fish and wildlife habitat conservation areas, 5. Other protected areas and elements necessary for species conservation.	
7.8. Habitat Mitigation Plan A. If the assessment conducted under Section 7.7 concludes the project is expected to have an adverse effect on water quality and/or aquatic or riparian habitat or habitat functions, the applicant shall provide a plan to mitigate those impacts, in accordance with *Regional Guidance for Floodplain Habitat Assessment and Mitigation*, FEMA Region X, 2010.	

Ordinance Language	Commentary
1. If the USFWS or NMFS issues a Incidental Take Permit under Section 10 ESA, Biological Opinion under Section 7, ESA; then it can be considered to qualifying as a plan to mitigate those impacts.	
2. If the project is located outside the Protected Area, the mitigation plan shall include such avoidance, minimization, restoration, or compensation measures so that indirect adverse effects of development in the floodplain (effects to storm water, riparian vegetation, bank stability, channel migration, hyporheic zones, wetlands, etc.) are mitigated such that equivalent or better habitat protection is provided.	The four mitigation approaches, avoidance, minimization, restoration, and compensation, are discussed in Step 5 of *Regional Guidance for Floodplain Habitat Assessment and Mitigation* (see Appendix A).
3. No new stream crossings are allowed outside the Protected Area.unless approval has been obtained as stated in Section 7.8.A.1	**ESA requirement (RPA 3A.2, Appendix 4, Section 3.10)**
4. If the project is located in the Protected Area, the mitigation plan shall stipulate avoidance measures as are needed to ensure that there is no adverse effect during any phase of the project.	
B. The plan's habitat mitigation activities shall be incorporated into the proposed project. The floodplain development permit shall be based on the redesigned project and its mitigation components.	
C. As required in Section 4.7, the *(floodplain administrator)* shall not issue a certification of use or a certificate of occupancy until all work identified in the Habitat Assessment and mitigation plan has been completed or the applicant has provided the necessary assurance that unfinished portions of the project will be completed, in accordance with Section 4.7.B.	There may be parts of the project that cannot be finished, even though the property is ready for use. An example would be the monitoring and maintenance of vegetation or restoration projects.
7.9. Alteration of Watercourses	
A. In addition to the other requirements in this Section 7, an applicant for a project that will alter or relocate a watercourse shall also submit a request for a Conditional Letter of Map Revision (CLOMR), where required by the Federal Emergency Management Agency. The project will not be approved unless FEMA issues the CLOMR (which requires ESA consultation) and the provisions of the letter are made part of the permit requirements.	Note that an alteration of a watercourse will likely need a habitat impact assessment as well as a CLOMR. The requirements for a CLOMR and a LOMR are in 44 CFR 65.12.
B. The *(floodplain administrator)* shall notify adjacent communities and the Department of Ecology prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency	**44 CFR 60.3(b)(6)**

Ordinance Language	Commentary
Management Agency.	**44 CFR 60.3(b)(7)**
C. Maintenance shall be provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished. If the maintenance program does not call for cutting of native vegetation, the system shall be oversized at the time of construction to compensate for said vegetation growth or any other natural factor that may need future maintenance.	Note that a channel maintenance project is subject to a permit under this ordinance. If the project involves activities that are not exempt under Sections 7.1 and 7.2, a habitat impact assessment will need to be conducted (Section 7.7).

Appendix A. References

References on the National Flood Insurance Program

NFIP Floodplain Management Requirements, A Study Guide & Desk Reference for Local Officials, FEMA 480 can be downloaded from www.fema.gov/library/viewRecord.do?id=1443

Manufactured Home Installation in Flood Hazard Areas, FEMA-85, can be downloaded from www.fema.gov/library/viewRecord.do?id=1577

FEMA Floodplain Management Bulletin 1-98 *Use Of Flood Insurance Study (FIS) Data As Available Data* can be downloaded from www.fema.gov/library/viewRecord.do?id=2231

The Technical Bulletin series can be found at www.fema.gov/plan/prevent/floodplain/techbul.shtm

FEMA Technical Bulletin 7-93, *Wet Floodproofing Requirements for Structures Located in Special Flood Hazard Areas,* can be downloaded from *www.fema.gov/library/viewRecord.do?id=1720*

FEMA Technical Bulletin 9-99, *Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings*, can be downloaded from www.fema.gov/library/viewRecord.do?id=1722

FEMA Technical Bulletin 11-01, *Crawlspace Construction for Buildings Located in Special Flood Hazard Areas* can be downloaded from www.fema.gov/library/viewRecord.do?id=1724

References on Habitat Protection

Regional Guidance for Hydrologic and Hydraulic Studies in Support of the Model Ordinance for Floodplain Management under the National Flood Insurance Program and the Endangered Species Act, FEMA Region X, 2010, http://www.fema.gov/about/regions/regionx/nfipesa.shtm

Regional Guidance for Floodplain Habitat Assessment and Mitigation, FEMA Region X, 2010, http://www.fema.gov/about/regions/regionx/nfipesa.shtm

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

NFIP ESA Biological Opinion Checklist, FEMA 2011, http://www.fema.gov/about/regions/regionx/nfipesa.shtm

"Forest Cover, Impervious-Surface Area, and The Mitigation of Stormwater Impacts," Booth, Derek, Hartley, David, and Jackson, Rhet, article in the *Journal of the American Water Resources Association*, June, 2002, www.cems.uvm.edu/ce361/papers/booth2002.pdf

Habitat Conservation Planning Handbook, US Fish & Wildlife Service and National Marine Fisheries Service, 1996, http://www.fws.gov/endangered/hcp/hcpbook.html

The Washington Department of Natural Resources Forest Water Typing System is found at www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx. The site has a link to the maps that have been prepared for counties.

Land Use Planning for Salmon, Steelhead and Trout: A land use planner's guide to salmonid habitat protection and recovery, Washington Department of Fish and Wildlife, October 2009, available at http://wdfw.wa.gov/habitat/plannersguide/index.html

Ecological Issues in Floodplains and Riparian Corridors, Susan M. Bolton and Jeff Shellberg, Center for Streamside Studies, University of Washington, which can be downloaded from www.wsdot.wa.gov/research/reports/fullreports/524.1.pdf

The Natural and Beneficial Functions of Floodplains − Reducing Flood Losses By Protecting and Restoring The Floodplain Environment, A Report for Congress by the Task Force on the Natural and Beneficial Functions of the Floodplain, FEMA 409, 2002.

Landscape Planning for Washington's Wildlife: Managing for Biodiversity of Developing Areas, Washington Department of Fish and Wildlife, 2009, found at http://wdfw.wa.gov/hab/phsrecs.htm

References on Higher Regulatory Standards

No Adverse Impact, A Toolkit For Common Sense Floodplain Management, Association of State Floodplain Managers, 2003, found at http://www.floods.org/NoAdverseImpact/NAI_Toolkit_2003.pdf

CRS Coordinator's Manual and *CRS Credit for Higher Regulatory Standards*, 2007, and available from NFIPCRS@ISO.com

CRS Credit for Mapping and Managing Channel Migration Areas, FEMA, [to be published in 2010]

Living with the River − A Guide to Understanding Western Washington Rivers and Protecting Yourself from Floods, Washington State Department of Ecology, 2007

Stormwater Management Manual for Western Washington, Washington Department of Ecology, 2005

Other floodplain management publications can be seen at or downloaded from www.fema.gov/plan/prevent/floodplain/publications.shtm

References on Low Impact Development

Low Impact Development − Technical Guidance Manual for Puget Sound, 2005, Puget Sound Action Team and Washington State University Pierce County Extension, found at www.psp.wa.gov/downloads/LID/LID_manual2005.pdf

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, 2005, found at www.ecy.wa.gov/programs/wq/stormwater/index.html

A printable brochure on the subject is at www.psparchives.com/publications/our_work/stormwater/lid/lid_brochure/lid_brochure06_8.5x11.pdf

Additional information can be found at the following websites:

- Puget Sound Partnership: www.psp.wa.gov/stormwater.php
- US Environmental Protection Agency: http://www.epa.gov/nps/lid/
- Low Impact Development Center: http://www.lowimpactdevelopment.org/ and www.lid-stormwater.net/index.html

Legal References

No Adverse Impact and The Courts: Protecting the Property Rights of All, 2007, Dr. John Kusler Esq. and Edward A. Thomas Esq., found at: www.floods.org/PDF/ASFPM_NAI_Legal_Paper_1107.pdf

*Mitigating Misery: Land Use and Protection of Property Rights Before the Next Big Flood***.** Edward A. Thomas Esq. and Sam Riley Medlock JD. *Vermont Journal of Environmental Law*, Vol. 9, 2008.

Law Review Article on the National Flood Insurance Program and the concept of No Adverse Impact Floodplain Management. Found at www.floods.org/PDF/Mitigation/ASFPM_Thomas&Medlock_FINAL.pdf

A Comparative Look at Public Liability for Hazard Mitigation, 2009, Jon Kusler, JD, PhD, ASFPM Foundation. Found at: ww.floods.org/PDF/Mitigation/ASFPM_Comparative_look_at_pub_liability_for_flood_haz_mitigation_09.pdf

"Significant Nexus" and Clean Water Act Jurisdiction, 2007, Jon Kusler Esq., PhD, Patrick Parenteau, Esq., and Edward A. Thomas Esq. Discussion paper for the Association of State Wetland Managers. Found at www.aswm.org/fwp/significant_nexus_paper_030507.pdf

Property Rights and Community Development: A Legal Framework for Managing Watershed Development, Massachusetts Coastal Zone Management Agency's StormSmart Coasts Program. Found at www.floods.org/NoAdverseImpact/NAI_Legal_Framework_Watershed_Development_2007.pdf

Appendix B. The Community Rating System

The Federal Emergency Management Agency's National Flood Insurance Program (NFIP) administers the Community Rating System (CRS). Under the CRS, flood insurance premiums for properties in participating communities are reduced to reflect the flood protection activities that are being implemented. This program can have a major influence on the design and implementation of floodplain management programs, so a brief summary is provided here.

General: A community receives a CRS classification based upon the credit points it receives for its activities. It can undertake any mix of activities that reduce flood losses through better mapping, regulations, public information, flood damage reduction and/or flood warning and preparedness programs.

There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction (see Table). A community that does not apply for the CRS or that does not obtain the minimum number of credit points is a class 10 community.

As of May 1, 2009, thirty Washington communities are participating. A list of the communities and their classes is shown below. It should be noted that King, Pierce, and Skagit Counties are the only counties in the country that are a Class 4 or better.

Community Rating System Premium Reductions

		Premium Reduction	
Class	Points	In Floodplain	Outside Floodplain
1	4,500+	45%	10%
2	4,000–4,499	40%	10%
3	3,500–3,999	35%	10%
4	3,000–3,499	30%	10%
5	2,500–2,999	25%	10%
6	2,000–2,499	20%	10%
7	1,500–1,999	15%	5%
8	1,000–1,499	10%	5%
9	500– 999	5%	5%
10	0 – 499	0	0

Washington CRS Communities

Community	Class	Community	Class	Community	Class
Auburn	5	King County	2	Skagit County	4
Bellevue	5	La Conner	8	Snohomish County	5
Burlington	5	Lewis County	7	Snoqualmie	5
Centralia	5	Lower Elwha	7	Sultan	7
Chehalis	6	Monroe	5	Sumas	7
Clark County	5	Mount Vernon	7	Thurston County	5
Ephrata	8	North Bend	6	Westport	6
Everson	7	Orting	6	Wahkiakum County	8
Fife	5	Pierce County	3	Whatcom County	6
Index	6	Renton	6	Yakima County	8
Issaquah	5				

As of October 1, 2009

Benefits of CRS participation: There is a direct dollar benefit to the communities and their policy holders for participation in the CRS. For example, more than half a million dollars stays in unincorporated King County in terms of the premiums saved by residents each year.

However, the direct financial reward for participating in the Community Rating System should not be the only reason for joining. As FEMA staff often say, "if you are only interested in saving premium dollars, you're in the CRS for the wrong reason."

The other benefits that are more difficult to measure include:

1. The activities credited by the CRS provide direct benefits to residents, including:
   - Enhanced public safety;
   - A reduction in damage to property and public infrastructure;
   - Avoidance of economic disruption and losses;
   - Reduction of human suffering; and
   - Protection of the environment.
2. A community's flood programs will be better organized and more formal. Ad hoc activities, such as responding to drainage complaints rather than an inspection program, will be conducted on a sounder, more equitable basis.
3. A community can evaluate the effectiveness of its flood program against a nationally recognized benchmark.
4. Technical assistance in designing and implementing a number of activities is available at no charge from the Insurance Services Office.
5. The public information activities will build a knowledgeable constituency interested in supporting and improving flood protection measures.
6. A community has an added incentive to maintain its flood programs over the years. The fact that its CRS status could be affected by the elimination of a flood-related activity or a weakening of the regulatory requirements for new developments should be taken into account by the governing board when considering such actions.
7. Every time residents pay their insurance premiums, they are reminded that the community is working to protect them from flood losses, even during dry years.

More information on the Community Rating System can be found at www.fema.gov/nfip/crs.shtm or contact Marlene Jacobs, the ISO/CRS Specialist for Washington State at 541-704-5434 or mjacobs@iso.com.

Aquatic and Riparian Habitat

A "habitat" is a specific area or environment in which a particular type of plant or animal lives. Different species have developed over the years in different habitats and they cannot survive for long if their habitats are destroyed or significantly altered. While some species adapt to change and can live with human development, others cannot.

Salt and brackish waters and their adjacent floodplains host habitats that are vital to estuarine and marine animals, including fish, shellfish, waterfowl, and mammals. These habitats are dependent on the quality and temperature of the water, salinity levels, and the availability of food.

Freshwater floodplains have two major types of habitat that are not found anywhere else: aquatic and riparian habitats. Freshwater aquatic habitats include rivers, streams, ponds, lakes and reservoirs that are above the influence of tides and are relatively free of salt water.

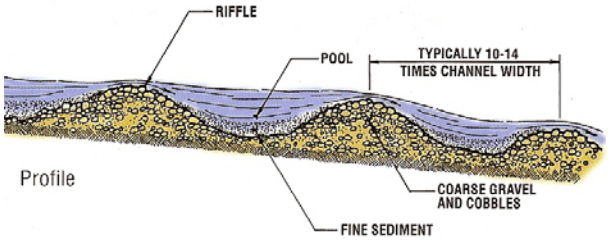
The quality of freshwater aquatic habitats is also dependent on the quality and temperature of the water and availability of food sources. In addition, riverine habitat needs pools and riffles. These are, in turn, dependent on rock and woody debris that form the pools and riffles and the vegetation and woody debris that offer refuge for small animals and food for others.

A riparian habitat area is defined by the Washington Department of Fish and Wildlife as "the area adjacent to aquatic systems with flowing water (e.g., rivers, perennial or intermittent streams, seeps, springs) that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other." The Department also notes "The riparian habitat area encompasses the entire extent of vegetation adapted to wet conditions as well as adjacent upland plant communities that directly influence the stream system." The term "riparian habitat" is interchangeable with the commonly used terms "riparian area," "riparian ecosystem," and "riparian corridor."

"Floodplains may contain the only suitable environment for growth of some species of vegetation and for the breeding/spawning of many species of fish and wildlife. Riparian habitats are among the most important vegetative communities for western wildlife species." *(The Natural and Beneficial Functions of Floodplains, p. 2-7)*

This harbor seal is a Puget Sound resident whose marine habitat can be threatened by development.

Source: NOAA Photo Library



Pools and riffles

Washington riparian habitat

Source: Department of Ecology

There is no clear line that separates salt water, freshwater, aquatic and riparian habitats because they are interdependent. Vegetation near and along stream banks slow and filter stormwater runoff that enters the stream. Streams carry fresh water to estuaries, replenishing the supply of brackish water. Riparian trees and bushes are dependent on the water provided by the stream. They, in turn, shade the pools and eventually become the woody debris that creates them. Their roots stabilize the streambanks, reducing erosion and sedimentation. The aquatic habitats nurture flora and fauna that are eaten by the residents of the riparian habitats and the insects and other wildlife that grow on land are eaten by the fish and frogs that live in the water, which are in turn eaten by waterfowl that nest on the land.

Habitat Conservation Areas

All habitats are important to the plants and animals that live in them. However, some areas are more deserving of protection. The Federal government designates "critical habitat" as habitat important for threatened or endangered species.

In addition to areas designated for protection under Federal or State programs, the Washington State Growth Management Act (WAC 365-190-080) identifies "Fish and Wildlife Habitat Conservation Area." This includes habitats of local importance and other areas that deserve protection. The NFIP-ESA Model Ordinance uses the State's definition:

> Lands needed to maintain species in suitable habitats within their natural geographic distribution so that isolated subpopulations are not created. These areas are designated by the _____ *[name of community]* pursuant to the Washington State Growth Management Act (WAC 365-190-080).

Alteration of Habitat

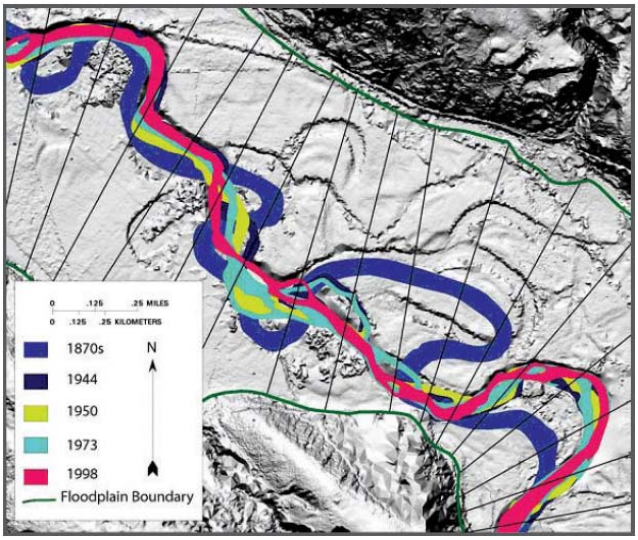
Habitats change as rivers, shorelines, and floodplains change. The following alterations can have significant impacts on habitat:

- Relocating channels
- Destroying pools and riffles
- Disrupting the continuity of the habitat along a stream
- Removing natural debris and rock that form instream shelters
- Erecting dams or other barriers to flow and fish passage
- Constructing levees to prevent channel migration or seawalls to stop erosion
- Reducing stream flow
- Clearing banks or removing tree canopy
- Disturbing rooted plants on the banks
- Armoring banks and shorelines
- Increasing flow velocity
- Increasing sediment in the water

These changes can be caused by nature, such as a flood, or by people. While both forces can change habitat, there is a difference between natural and human caused alterations.

Natural Alteration

Rivers and streams build, erode, and modify the landscape. Floodplains are not static features, they are always changing (some changes are more obvious right after a flood). These changes are wrought by eroding of channel banks and bottoms by fast moving water and by depositing of rock, sediment, and debris by slower moving water. These materials come from runoff and from scouring of the banks, i.e., the riparian areas.



Historical channel migration paths of the Quinault River
Source: *Living with the River*, p. 31

The results of these forces include new pools, sand bars, and undercut banks. The most impressive of these changes is channel migration, i.e., moving the channel to a new path.

Even if some features are destroyed or moved, they reappear elsewhere and new habitat emerges in the new location. Natural alterations of streams and riparian areas do not permanently destroy habitat, they just change its location as the forces of nature continue to work.

Human Alteration

Human activity, such as land development, can cause the alterations listed on the previous page. Here are some typical examples:

- Forestry has resulted in clear cut riparian areas, increased sedimentation, and reduced supplies of large woody debris needed for aquatic and riparian habitats.
- Farming causes a demand for levees and other flood control barriers to reduce flooding on productive fields. Runoff from farm fields carries sediment and chemicals into the streams.
- Roads and railroads obstruct natural drainage patterns, bridges can become dams at higher flows, and stormwater running off pavements contribute to water pollution.
- Urban development has cleared floodplains and resulted in calls for levees, dams, and channel straightening projects to protect homes and businesses.
- Shorelines and trees are cleared to gain access to the waterfront or to erect a levee, disturbing rooted plants on the banks.
- Dams are built for flood control, water storage, or power generation. These can reduce flows and upset seasonal flow conditions.

- Channels are relocated or straightened to increase their flood carrying capacity or to get them out of the way of development (see example to the right). Such projects destroy pools and riffles and remove debris and rock that form instream shelters, sometimes replacing a natural stream bottom with concrete.

Compare what humans did to the Puyallup River with the map of what rivers do naturally on the previous page.

- Urban development of the watershed brings impervious areas, such as rooftops and roads, and filling of wetlands and floodplains. The result is more rain water running off, fewer places to store it in, and, therefore, higher and faster flows in the channels. Another result is lower and warmer flows during the summer and early fall.
- Higher flows mean more bank erosion and scouring of streambeds.
- Urban runoff picks up sediment that is dropped in the pools and other areas of lower velocity. With the sediment comes pollutants, such as road oil and trash, that degrade water quality.
- Increased stormwater runoff means more water leaves the watershed instead of percolating into soils and recharging groundwater levels. With less groundwater, there are lower flows in streams during dry periods.
- Government regulations have often had counter productive impacts. For example, in order to remove a property from the NFIP's floodplain development regulations, property owners often fill riparian areas to raise the elevation of the ground above the regulatory flood elevation. This can kill the natural vegetation, reduce floodplain storage capacity (which increases velocities), and often change stream alignments.
- Flood protection programs commonly view debris in the channel as potential dams, so maintenance crews remove fallen trees and rootwads that are needed for aquatic habitat. Channelization projects remove the riffles so the stream will flow faster.

The main difference between the natural and human causes of habitat alterations is that the natural changes allow habitat to be created in another area. Human development in urban areas, on the other hand, does not offer alternatives. When a stream is straightened and leveed, it is constrained. There are no other places for pools and riffles to form or banks where trees are allowed to grow. If the floodplain is filled or urbanized, the riparian habitat is destroyed, not moved.

Example: Chinook Salmon Habitat

Source: www.scv-habitatplan.org/

Chinook salmon require different habitats during different phases of their life. Adult Chinook salmon spawn in freshwater streams in the late summer and fall. Spawning habitat typically consists of gravel and cobbles in stream riffles and the edges of stream pools. This rock layer ("substrate") provides a sheltered place for the eggs and the flowing water provides oxygen.

Chinook fry emerge in the late winter and early spring. Young Chinook grow in the lower main stem of rivers and tributaries before entering the estuaries and salt marshes. They feed and seek refuge from predators in channel, off-channel, and riparian wetland habitats which have woody debris and overhanging vegetation. Within a year, they smolt, and need to move from a freshwater to a saltwater habitat. Most Chinook spend from two to four years feeding in the North Pacific before they return to spawn. When they're ready, they swim back to the streams they were born in and die after spawning.

Chinook salmon has been an important commercial and sport fish. It accounted for the majority of the Columbia River harvest in the late 1800s. While overfishing contributed to its decline, that isn't the only reason why it is protected by the Endangered Species Act.

The river habitats of the Chinook salmon have been subjected to the adverse impacts noted on the previous pages. The floodplains on the streams that drain into Puget Sound, the Columbia River, and the Pacific Ocean have been logged, farmed, and built on. The rivers have been channelized and leveed, destroying the pools, riffles, vegetation, and bank protection. Some have been dammed. Floodplains have been filled. Runoff from farms and urbanized areas brought increased sediment that settled in the gravel and cobbles, reducing oxygen and refuge for fry.

As a result, the population of the Chinook salmon has decreased dramatically over the years. In the early 1990's NMFS listed the Chinook salmon is a threatened species in various areas on the West Coast. In 1999, it listed the Puget Sound Chinook as threatened and the Upper Columbia River Chinook salmon as endangered. In its designation, NMFS noted

> Their current threatened status cannot be explained by natural cycles in ocean and weather conditions. NMFS has concluded that threatened Chinook, coho, chum, sockeye, and steelhead are at risk of extinction primarily because their populations have been reduced by human "take." West Coast populations of these salmonids have been depleted by take resulting from harvest, past and ongoing destruction of freshwater and estuarine habitats, hydropower development, hatchery practices, and other causes….
>
> Although the primary purpose of state, local, and other programs is generally to further some activity other than conserving salmon, such as maintaining roads, controlling development, ensuring clean water or harvesting trees, some entities have adjusted one or more of these programs to protect and conserve listed salmonids. NMFS believes that with appropriate safeguards, many such activities can be specifically tailored to minimize impacts on listed threatened salmonids … *[50 CFR 223, July 10, 2000]*

In its September 2008 Biological Opinion, NMFS concluded:

> As the human population in the action area continues to grow, the burden on land presently used for agricultural, commercial, or residential development is also likely to grow. As land-uses shift from natural, to rural, to suburban, the watershed functions related to processing precipitation decrease. The ability of land to accept and slowly transport water to streams and aquifers decreases in the upper watershed as does the flood storage capacity in the lowlands.
>
> The watershed functional changes mentioned above result in several of the habitat affecting processes mentioned earlier in this Opinion. The result of these process changes include induced flood damage, increased flood stages, increased volume of instream flows, increased velocity of instream flows, and erosion and sedimentation…
>
> As the human population in the action area continues to grow, new development is likely to further reduce the habitat function in watersheds through water withdrawals, storm water quality and quantity degradation, loss of riparian functions, and encroachment in channels and floodplains. Cumulative effects of actions that destabilize fluvial systems are harmful to salmon. Channelization is an immediate and complete disruption of the riparian and aquatic communities that colonize rivers. In many cases, biological communities will reestablish themselves within channelized reaches. However, maintenance dredging, removing vegetation along channel walls, and adding riprap and concrete can completely prevent restoration of biological communities and lead to long-term or permanent disruption. *[Biological Opinion pages 142 – 143]*

This streamside trail in Redmond is a good example of an urban recreational development that protects aquatic and riparian habitat.

Appendix D. The Biological Opinion

The Biological Opinion was issued by the National Marine Fisheries Service on September 22, 2008. The document is 226 pages long. It can be viewed in its entirety at www.nwr.noaa.gov/Salmon-Habitat/ESA-Consultations/FEMA-BO.cfm. Errata letters were issued on October 23, 2008, and May 14, 2009, to correct typos and update the information and also can be found at the above site.

The transmittal letter states,

> As required under the Endangered Species Act for consultations concluding with Jeopardy and Adverse Modification determinations, the National Marine Fisheries Service discussed with the Federal Emergency Management Agency, the availability of a reasonable and prudent alternative that the Federal Emergency Management Agency can take to avoid violation of the Federal Emergency Management Agency's Endangered Species Act section 7(a)(2) responsibilities (50 CFR 402.14(g)(5)). Reasonable and prudent alternatives refer to alternative actions identified during formal consultation that 1) can be implemented in a manner consistent with the intended purpose of the action, 2) that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, 3) that is economically and technologically feasible, and 4) that the Director believes would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat (50 CFR 402.02) The biological opinion includes a reasonable and prudent alternative which can be implemented to avoid jeopardy and adverse modification of critical habitat, while meeting each of the other requirements listed above.

The Biological Opinion Reasonable and Prudent Alternative include the following seven elements:

> RPA Element 1 − Notification of Consultation Outcome: FEMA's requirement to notify communities of this Biological Opinion. This was done via letter of October 21, 2008.
>
> RPA Element 2 − Mapping
>
> RPA Element 3 − Floodplain Management Criteria
>
> RPA Element 4 − Community Rating System: Some of the items mentioned are included in the model ordinance. A separate Guidance is published on CRS credit for protecting natural floodplain functions.
>
> RPA Element 5 − Levees: Relates only to communities with levees and FEMA mapping criteria. Not related to the model ordinance.
>
> RPA Element 6 − Floodplain Mitigation Activities: If permitted projects are found to be contrary to the Opinion, FEMA will ensure that there is mitigation.
>
> RPA Element 7 − Monitoring and Adaptive Management: FEMA will report each year to NMFS

This appendix includes RPA Elements 2 and 3, the ones that directly affect local regulations and that are incorporated into this model ordinance. It also includes Appendix 4 of the Biological Opinion, which expands on RPA Element 3. The errata letter corrections are included in this Appendix.

Reasonable and Prudent Alternative Element 2--Mapping. *[Starting on page 152 of the Biological Opinion]*

The FEMA shall make the following changes to the mapping program of the proposed action to achieve the habitat-based objectives stated above, to avoid jeopardy of the species and adverse modification of the

critical habitat. The FEMA shall implement the following changes to the mapping program within six months of the issuance of this Opinion, and report progress to NMFS on an annual basis on all sub-elements below.

A. The FEMA shall process Letters of Map Change caused by manmade alterations only when the proponent has factored in the effects of the alterations on channel and floodplain habitat function for listed salmon, and has demonstrated that the alteration avoids habitat functional changes, or that the proponent has mitigated for the habitat functional changes resulting from the alteration with appropriate habitat measures that benefit the affected salmonid populations. The FEMA will ensure that effects from habitat alterations that are reasonably certain to occur but might occur later in time, such as changes in storm water quantity, quality, and treatment, decreased riparian vegetation, lost large woody debris, increased bank armoring, and impaired channel migration, are also mitigated. The FEMA will report to NMFS on the results of mitigation for manmade floodplain changes that become the basis for map revision requests. During the time period subsequent to the issuance of this Opinion and prior to full implementation of this element, FEMA will engage in ESA consultation with NMFS prior to processing LOMCs related to manmade floodplain alterations.

B. The FEMA will prioritize their mapping activities based upon the presence of sensitive salmon populations as identified in Appendix 3.

C. The FEMA shall ensure that floodplain modeling incorporates on-the-ground data to increase the accuracy of maps depicting the floodplain. For multi-thread channels, FEMA shall produce and distribute a Technical Bulletin recommending the use of unsteady state hydraulic models to map the boundaries of the 100-year floodplain. In addition, FEMA will use a 2-dimensional model in estuarine floodplains and in other areas, when applicable.

The FEMA will also revise map modeling methods to consider future conditions and the cumulative effects from future land-use change, to the degree that such information is available (e.g. zoning, urban growth plans, USGS Climate study information. Future conditions considered should include changes in the watershed, its floodplain, and its hydrology; climate change, and other conditions that affect future flood risk. The FEMA shall ensure that jurisdictions use anticipated future land use changes when conducting hydrologic and hydraulic calculations to determine flood elevations.

D. The FEMA shall encourage communities to evaluate and identify the risk of flooding behind 100 year levees based on anticipated future conditions and the cumulative effects from future land-use change. Future conditions considered should include changes in the watershed, its floodplain, its hydrology, and climate change.

Taken together, these changes to the proposed mapping element of the NFIP contribute to avoiding jeopardy and adverse modification of critical habitat by increasing the accuracy of maps depicting floodplains, which are a habitat resource for salmonids. The changes also protect habitat function through the tracking of LOMRs, and requiring mitigation for LOMCs (FEMA would only issue LOMCs for man made changes when the for floodplain functional change is provided). The FEMA prioritization of mapping activities to focus on areas necessary to support VSPs means that the protection of floodplain resources for priority populations will occur earlier than in other locations. The RPA mapping element requires the use of more accurate computer models from those typically used under the proposed action,

where appropriate to map the 100-year floodplain for multiple thread channels and estuarine floodplains, providing more comprehensive and accurate mapping of these resources in complex areas.

Tracking floodplain development and analyzing effects enables better application of habitat protection and mitigation measures. Assessment and analysis in the mapping process is likely to moderate land-use changes in floodplains providing functional salmon and steelhead habitat by either avoiding or mitigating for land use changes that affect salmon habitat. The FEMA can work with affected communities to adjust previous approaches to construction in these areas in response to their analysis of effects on the existing salmonid habitat value.

Refining the modeling used to identify complex channels enables FEMA to better protect salmon and their habitat in modeled areas by more accurately identifying floodplains. Prioritizing map updates in NFIP participating communities identified by NMFS as areas particularly important to conserving PS Chinook salmon, steelhead, and chum salmon, gives those communities the most accurate information possible with which to evaluate and respond to the effects of land use change and construction on listed species. Detailed maps also help protect salmon and steelhead habitat by enabling more refined application of minimum floodplain management criteria.

The mapping RPA element meets each of the other RPA criteria (economic feasibility, intended purpose of the action, and within the agency's authority) in that the RPA element merely refines activities within the existing program to account more specifically for the effects of the mapping element on listed salmon and steelhead. The FEMA has four areas of discretion in their mapping program. These include the level of study performed in the FIS, including the designation of a regulatory floodway, review and issuance of CLOMRs, CLOMR-Fs and LOMAs, requirements associated with LOMRs and LOMR-Fs, and Map Modernization/Risk MAP. The RPA does nothing to exceed or abridge that authority. Therefore, actions described in the mapping RPA element are within the scope of FEMA's legal authority for mapping actions and meet the intended purpose of the proposed action.

Reasonable and Prudent Alternative Element 3 – Floodplain Management Criteria .

The FEMA shall modify its implementation of the NFIP minimum criteria in NFIP communities in the Puget Sound Region in order to prevent and/or minimize the degradation of channel and floodplain habitat, as described below. In addition FEMA will report progress to NMFS on an annual basis on all sub-elements below.

A. As soon as possible upon issuance of this Opinion, FEMA shall revise its implementation of the current NFIP minimum criteria so that the following measures, necessary for protecting listed salmonids, are carried out in the Puget Sound Region as described in Appendix 4 (Minimum Criteria) and summarized below:

1. Allow no development in the floodway, the, CMZ plus 50 feet (as identified according to Ecology 2003), and the riparian buffer zone (RBZ, as described by the Department of Natural Resources 2007 stream typing system and WDFW's 1997 stream buffer guidelines), and floodway (as mapped by the FIRM).

Or

2. The local jurisdiction with permitting authority must demonstrate to FEMA that any proposed development in the FEMA designated floodway, the CMZ plus 50 feet (as identified according to Ecology 2003), and the riparian buffer zone (RBZ, as described by the Department of Natural Resources 2007 stream typing system and WDFW's 1997 stream buffer guidelines) does not adversely affect water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refugia for listed salmonids .

3. In addition to either 1 or 2 above, either:

a. Prohibit development in the 100-year floodplain,

OR

b. If development within the 100-year floodplain but outside the RBZ, is permitted, any loss of floodplain storage shall be avoided, rectified or compensated for. An example of compensation is the creation of an equivalent area and volume of floodwater storage and fish habitat through a balanced cut and fill program that provides fish refugia habitat and prevents fish stranding. Additionally, indirect adverse effects of development in the floodplain (effects to stormwater, riparian vegetation, bank stability, channel migration, hyporheic zones, wetlands, etc.) must also be mitigated such that equivalent or better salmon habitat protection is provided. (See Appendix 4 for more detail on how to comply with this criteria). Using option 3.A.3.b will require tracking the projects that occur and reporting to FEMA on a semi-annual basis (see 3.D. below).

For development within the 100 year floodplain permitted under 3.A.3.b, construction in the floodplain shall use Low Impact Development (LID) methods (generally requiring infiltration of all on-site stormwater), such as those described in the Low Impact Development Technical Guidance Manual for Puget Sound (Puget Sound Action Team and WSU/Pierce County Extension 2002) to minimize or avoid stormwater effects.

4. Any improvements or repairs to existing structures that result in a greater than 10 percent increase of the structure footprint must mitigate for any adverse effects to species or their habitat as described in 3.A.3.b.

B. The FEMA shall implement RPA Element 3.A by ensuring that all participating NFIP communities in the Puget Sound region implement land-use management measures consistent with the criteria as soon as practicable, but in no event later than three years from the date of this Opinion.

1. The FEMA shall focus its implementation efforts first on communities located in areas of "Tier 1" salmon populations, secondly on communities located in areas of "Tier 2" salmon populations, and then on the remaining Puget Sound NFIP communities (see Appendix 3 for an explanation of Tier 1 and 2 populations and a list of jurisdictions where they are located). The FEMA shall demonstrate compliance with the following benchmarks:

a. Thirty-five percent of NFIP jurisdictions in the Puget Sound Region shall have implemented the criteria set forth in RPA Element 3.A within two years of this issuance of this opinion, including 100 percent of Tier I jurisdictions;

b. Seventy percent of NFIP jurisdictions in the Puget Sound Region shall have implemented the criteria set forth in RPA Element 3.A within two and a half years of the issuance of this opinion, including 100 percent of Tier 2 jurisdictions; and

c. One hundred percent of NFIP jurisdictions within the Puget Sound Region shall have implemented the criteria set forth in RPA Element 3.A within three years of the issuance of this Opinion.

2. Until all Puget Sound communities have implemented the criteria set forth in RPA Element 3.A, the FEMA shall report annually to NMFS on the status of its efforts to implement the RPA and the number of Puget Sound NFIP jurisdictions that have implemented the revised criteria.

C. Interim Actions. In the time period between the issuance of this Opinion, and the full implementation of RPA 3.A by participating communities, FEMA shall advise the Puget Sound NFIP communities that they must keep track of all floodplain permits that they issue and report this information to FEMA on an annual basis. The FEMA will provide this information to NMFS annually, highlighting any permits that allowed development affecting channel or floodplain habitat, or resulted in indirect effects to salmonid habitat from stormwater, removal of riparian vegetation, bank armoring, changes in the CMZ, large wood input, or gravel recruitment, etc. If NMFS finds that any unmitigated actions affecting listed species have occurred as a result of these permits, NMFS will advise FEMA to this effect, and FEMA will ensure that mitigation is provided prior to the next reporting period. Mitigation actions shall comport with those habitat restoration and enhancement actions consulted on in the programmatic consultation between NMFS and the COE, entitled *Washington State Fish Passage and Habitat Enhancement Restoration Programmatic*, NMFS Tracking No. 2008-03598.

D. Long term actions. Communities that have adopted the minimum criteria option allowing equivalent cut and fill (3.A.3.b. above), must report to FEMA on the number of projects that take place in the floodplain and the effectiveness of the mitigation. If based on FEMA's annual reporting, NMFS finds that the mitigation is not fully effective, FEMA shall ensure that further mitigation is provided for these actions through RPA Element 6 or through other means available to the community (e.g., mitigation banks) and shall reflect these actions in the next annual report. Mitigation actions shall comport with those habitat restoration and enhancement actions consulted on in the programmatic consultation between NMFS and the COE, entitled *Washington State Fish Passage and Habitat Enhancement Restoration Programmatic*, NMFS Tracking No. 2008-03598.

Under RPA Element 3, Floodplain Management Criteria, the performance measures for developing in the floodway, CMZ and RBZ will ensure that development within a designated riparian buffer zone (RBZ, measured from the OHW of the stream channel depending on stream type), the CMZ plus 50 feet, the mapped floodway, and the 100-year floodplain, will not result in adverse habitat effects. This will also allow activities with primarily beneficial effects to still occur within those zones. The NFIP as currently implemented allows development in the floodplain, the CMZ, and the riparian buffer, as long as it is at or above the BFE. The NMFS expects that this part of the RPA will prevent further degradation of channel function and estuarine and freshwater floodplain function in areas that would otherwise be prone to new development, thus maintaining the current value of the habitat in the RBZ and 100-year floodplain for listed salmon.

If communities choose to address impacts with equivalent cut and fill measures, development will be allowed in the floodplain with accompanying mitigation (similar area and volume of habitat and flood

storage are provided to protect listed salmon and habitat). In addition, no unmitigated effects from floodplain development are allowed arising from changes in stormwater discharge, riparian vegetation, channel migration, large wood input, gravel recruitment, the hyporheic zone, wetlands, and bank stability. The NMFS expects that this option will provide protection equivalent to the no development in the floodplain criteria in most cases, thereby maintaining the value of existing habitat in areas of new development. If NFIP and FEMA annual reporting reveals that equivalent protection is not provided, NMFS shall advise FEMA, and FEMA or the community are responsible for providing the remaining mitigation through either RPA Element 6, or other means available to the community.

For both minimum criteria options, the use of LID (Low Impact Development) methods to minimize increased volumes and decreased water quality of stormwater from development is required. As currently implemented, the NFIP does not specify any requirements for stormwater management in the floodplain, even though increased stormwater runoff from development contributes to increased streams flows that cause flood damage, and to decreased water quality during flood events. This requirement for stormwater control and treatment will minimize the effects on both water quality and quantity from new development, as LID methods will require infiltration and dispersion of stormwater runoff to duplicate the frequency, timing, duration and quality of pre-development (historic) stormwater discharges.

The RPA at element 3 also addresses re-development of existing buildings in the floodplain by addressing the effects of re-development of structures that exceed ten percent of the current footprint instead of the 50 percent of market value, which is currently allowed. The NMFS expects this will minimize the adverse effects of re-development associated with existing buildings in the floodplain, thereby further minimizing the effects on critical habitat and listed species. In addition, any re-development in the floodplain requires mitigation for all direct and indirect effects of re-development.

The FEMA must report to NMFS on their progress in meeting timelines and benchmarks for implementing the revised floodplain management criteria and ensuring communities adopt these criteria as soon as possible, and in no event later than the specified deadlines. These timeline and benchmarks are intended to ensure that protection is provided to channel and floodplain habitat and listed salmon species in a timely manner. In addition, FEMA will provide floodplain permit information to NMFS on an annual basis, until the new criteria are fully implemented, highlighting any permits that allowed development affecting channel or floodplain habitat, or resulted in indirect effects to salmonid habitat from stormwater, removal of riparian vegetation, bank armoring, etc. If NMFS finds that any unmitigated actions affecting listed species have occurred as a result of these permits, FEMA will ensure mitigation for these actions through RPA Element 6.

Also, communities will provide information to FEMA on a semi-annual basis, documenting the projects that took place in the floodplain using the mitigated equivalent cut and fill option. Communities will report on the expected effects to listed salmon habitat, the planned mitigation to compensate for the effects, and the success of the mitigation outcome. If the mitigation is found to not provide equivalent compensation for effects, the community or FEMA is responsible for providing additional mitigation to address the shortfall in habitat function. Providing this shortfall protection will ensure that development that occurs in the floodplain will provide habitat function similar to the no development in the floodplain criteria, thereby maintaining the value of existing habitat in areas of new development. This step is necessary as several scientific publications document the limited success of compensatory mitigation to date, particularly for wetlands (National Academy of Sciences 2001, Washington Department of Ecology 2001). Evaluating the results also provides an opportunity to adapt actions and/or implement alternatives

to more effectively maintain habitat function in the 100-year floodplain (e.g., increasing mitigation ratios, more monitoring, etc.).

This RPA element meets each of the other RPA criteria (intended purpose of the action, within the agency's authority, and economic feasibility) in that the RPA element merely refines activities within the existing program to account more specifically for the effects of the minimum criteria on listed salmon and steelhead. This RPA element is consistent with the intended purposes of the NFIP as these measures would constrict the extent of new development in the floodplain, achieving a decrease of property exposed to flood damage. The minimum criteria actions would limit development of the floodplain or provide equivalent mitigation for development in the floodplain (preventing more structures from being at risk of flooding and preserving salmon habitat), maintaining or minimizing stormwater runoff inputs to rivers (maintaining flood severity or frequency of floods and water quality), and maintaining currently functioning riparian corridors, CMZs, and bank stability.

According to the BE and the governing law, FEMA has discretion in establishing the minimum floodplain management criteria. The NFIA states that the purposes of the minimum criteria are to: (1) constrict the development of land which is exposed to flood damage where appropriate, (2) guide the development of proposed construction away from locations which are threatened by flood hazards, (3) assist in reducing damage caused by floods, and (4) otherwise improve the long-range land management and use of flood-prone areas. 42 U.S.C. 4102(c). Also, the statute indicates that FEMA is to revise the criteria "from time to time."[21] Id. Therefore, actions identified in the minimum criteria element of the RPA are all within FEMA's legal authority.

> [Footnote 21: FEMA's regulations provide that, when FEMA revises the criteria, communities have six months within which to revise their floodplain management regulations to meet the new criteria. 44 CFR 60.7.]

Finally, many of the measures in this RPA element have already been suggested and/or supported by FEMA's own Model Floodplain Ordinance (FEMA 2002a). As such FEMA has demonstrated its finding that they are economically feasible. Furthermore, they are addressed in other scientific and technical literature on the subject (see for example, Association of State Floodplain Managers 2007, among others). Also, many of the RPA minimum criteria elements are already carried out by NFIP participating communities such as King and Pierce counties, under their own local authorities, further demonstrating their economic feasibility.

Appendix 4: Minimum Criteria

It is the purpose of the following criteria to maintain streams and floodplains in their natural state to the maximum extent possible so they support healthy biological ecosystems, by: 1) assuring that flood loss reduction measures under the NFIP protect natural floodplain functions and riparian habitat, and the natural processes that create and maintain fish habitat, and 2) preventing or minimizing loss of hydraulic, geomorphic, and ecological functions of freshwater and estuarine floodplains and stream channels.

In all 100-year floodplain areas (SFHAs) the following criteria apply:

1. Restrict development in the Riparian Buffer Zone for all watercourses including off channel areas (areas outside this zone but within the Special Flood Hazard Area) to provide necessary protection to the RBZ. The RBZ is the greater of the following:

- 250 feet measured perpendicularly from ordinary high water for Type S (Shorelines of the State) streams, 200 feet for Type F streams (fish bearing) greater than 5 feet wide and marine shorelines, and 150 feet for Type F streams less than 5 feet wide, for lakes. For type N (nonsalmonid-bearing) perennial and seasonal streams a 150 foot or 225 foot buffer applies, depending on slope stability (the 225 foot buffer applies to unstable slopes), *[updated per the May 14, 2009, errata letter]*
- the Channel Migration Zone[22] plus 50 feet; and
- the mapped Floodway.

The Riparian Buffer Zone is an overlay zone that encompasses lands as defined above on either side of all streams, and for all other watercourses including off channel areas. The RBZ is a no disturbance zone, other than for activities that will not adversely affect habitat function. Any property or portion thereof that lies within the RBZ is subject to the restrictions of the RBZ, as well as any zoning restrictions that apply to the parcel in the underlying zone.

[Footnote 22: The lateral extent of likely movement along a stream reach during the next one hundred years with evidence of active stream channel movement over the past one hundred years. Evidence of active movement can be provided from aerial photos or specific channel and valley bottom characteristics. A time frame of one hundred years was chosen because aerial photos and field evidence can be used to evaluate movement in this time frame. Also, this time span typically represents the time it takes to grow mature trees that can provide functional large woody debris to most streams. In large meandering rivers a more detailed analysis can be conducted to relate bank erosion processes and the time required to grow trees that function as stable large woody debris.

With the exception of shorelands in or meeting the criteria for the "natural" and "rural conservancy" environments, areas separated from the active channel by legally existing artificial channel constraints that limit bank erosion and channel avulsion without hydraulic connections shall not be considered within the CMZ. All areas, including areas within the "natural" and "rural conservancy" environments, separated from the natural channel by legally existing structures designed to withstand the 100-year flood shall not be considered within the CMZ. A tributary stream or other hydraulic connection allowing listed species fish passage draining through a dike or other constricting structure shall be considered part of the CMZ.]

Restrictions in this area apply to all development, per the definition of development.[23] Uses that are not permitted unless shown not to adversely affect water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refugia for listed salmon, include the following: new buildings, including accessory buildings; new impervious surfaces; removal of native vegetation; new clearing, grading, filling, land-disturbing activity or other "development" (see definition), other than for the purpose of replacing non-native vegetation with native vegetation, and for other approved restoration work; septic tanks and drain fields, dumping of any materials, hazardous or sanitary waste landfills; receiving areas for toxic or hazardous waste or other contaminants; and, stream relocations, unless the primary function of the action is to restore natural ecological function.

[Footnote 23: 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, storage of equipment or materials, or any other activity which results in the removal of substantial amounts of vegetation or in the alteration of natural site characteristics located within the area of special flood hazard.]

In the RBZ the following uses are allowed: [1] repair or remodel of an existing building in its existing footprint, including buildings damaged by fire or other casualties; [2] removal of noxious weeds; [3] replacement of non-native vegetation with native vegetation; [4] ongoing activities such as lawn and garden maintenance; [5] removal of hazard trees; [6] normal maintenance of public utilities and facilities;

and [7] restoration or enhancement of floodplains, riparian areas and streams that meets Federal and State standards

2. Protect fish habitat and flood storage in the remaining 100-year floodplain (outside the RBZ) by either:

a.) Prohibiting development in the 100-year floodplain, OR

b.) Providing compensation for any adverse effects to floodwater storage and fish habitat function within the 100-year floodplain. *[updated per the May 14, 2009, errata letter]*

Any development in the 100-year floodplain must be compensated, for example, through the creation of an equivalent area and volume of floodwater storage and fish habitat through a balanced cut and fill program. The new flood storage/habitat area must be graded and vegetated to allow fish refugia during flood events and return to the main channel as floodwaters recede without creating stranding risks. In addition, equivalent area, if not located on site, must be located in priority floodplain restoration areas identified in the ESU Recovery Plan for listed species.

3. Mitigate for all adverse indirect effects of development in the floodplain (effects to stormwater, riparian vegetation, bank stability, channel migration, hyporheic zones, wetlands, LWD, etc.) such that equivalent or better salmon habitat protection is provided. *[updated per the May 14, 2009, errata letter]*

Stormwater. Reduce flood volumes and stormwater runoff from new development by ensuring that increased volumes of stormwater reach the river at the same frequency, timing, and duration as historical runoff. Low Impact Development (LID) methods are required to treat and infiltrate runoff as described in PSAT 2002. These methods generally include various practices for infiltrating stormwater to provide water quality treatment, match historical runoff durations, and preserve base flows.

Riparian vegetation: Maintain or replace riparian function by providing equivalent area, diversity, and function of riparian vegetation as currently exists on the site (per WDFW riparian management recommendations (Knutson and Naef 1997).

Bank Stability: Bank stabilization measures along salmonid-bearing streams, channel migration zones, and along estuarine and marine shorelines must be minimized to the maximum extent possible. If bank stabilization measures are necessary, bioengineered armoring of streambanks and shorelines must be used (per the Integrated Streambank Protection Guidelines 2003 (for riverine shorelines) or the State Shorelines Guidelines on bank stabilization (2003) (for estuarine and marine shorelines).

Channel migration. No activity is allowed that limits the natural meandering pattern of the channel migration zone, however, natural channel migration patterns may be enhanced or restored (see Rapp and Abbe 2003, for delineating channel migration zones).

Hyporheic zones. No activity is allowed that interferes with the natural exchange of flow between surface water, groundwater and the hyporheic zone, however, natural hyporheic exchange may be enhanced or restored (see Bolton and Shellberg. 2001 for hyporheic zone issues).

Wetlands. Wetland function must be maintained or replaced by providing equivalent function per Washington State Department of Ecology (McMillan 1998) regulations.

LWD. Any LWD removed from the floodplain must be replaced in kind, replicating or improving the quantity, size, and species of the existing LWD (per WDFW Aquatic Habitat guidelines).

In the 100-year floodplain outside the Riparian Buffer Zone the following apply:

1) For buildable lots partially in the floodplain, require structures to be located on the portion of the lot outside of the mapped floodplain. Where a buildable lot is fully in the floodplain, structures must be sited in the location that has the least impact on listed salmon, e.g., located as far from the stream or river as possible on the lot, placing structures on the highest land on the lot, orienting structures parallel to flow rather than perpendicular, and avoiding disruption of active hyporheic exchange on a site.

2) Require zoning to maintain a low density (e.g., 5-acre lots or greater) of floodplain development to reduce the damage potential within the floodplain to both property and habitat, and help maintain flood storage and conveyance capacity.

3) All structures must be set back at least 15 feet from the RBZ and shall be sited as close to the 100-year floodplain boundary as possible.

4) In an effort to site structures as far away from the watercourse and RBZ as possible, the applicant will be apprised of the elevations of the 10-year and 50-year floods in detailed study areas at the same time that the (city, county) provides the 100-year elevation as a part of the permit review. The applicant, in addition to plotting the 100-year elevation near the building site, will also plot the 10 and 50-year elevations on the land. The purpose is to show the applicant the significantly lower risk of placing the structure further away from the watercourse.

5) Structures built using post, pier, piling or stem wall construction may require less mitigation than structures built on earth fill, but must provide equivalent mitigation for lost fish habitat and indirect effects from development.

6) Creation of new impervious surfaces[24] shall not exceed 10 percent of the surface area of the portion of the lot in the floodplain unless mitigation is provided.

> [Footnote 24: Any material or land alteration (i.e. clearing, grading, etc.) which reduces or prevents absorption of storm water into the ground. That hard surface area which either prevents or retards the entry of water into the soil, water that had entered under natural conditions prior to development; and/or that hard surface area that causes water to run off the surface in greater quantities or at an increased rate of flow from that present under natural conditions prior to development. Common impervious surfaces include, but are not limited to: roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, and packed earthen materials.]

7) Removal of native vegetation must leave 65 percent of the surface area of the portion of the lot in the floodplain in an undeveloped state; the 65 percent pertains to the entire portion of the lot in the floodplain, including that area in the RBZ, where removal of native vegetation is generally prohibited.

8) The proposed action must be designed and located so that it will not require new structural flood protection (e.g., levees).

9) During the floodplain permit review process, applicants shall be notified that their property contains land within the Riparian Buffer Zone and/or 100-year floodplain, and that the applicant is required to record a Notice on Title on the property before a permit may be issued. Applicants shall be further notified that development in the RBZ and 100-year floodplain can only occur according to the above criteria.

10) New road crossings over streams are prohibited.

11) Concepts of cluster development, density transfer, credits and bonuses, planned unit development, and transfer of development rights shall be employed wherever possible.

12) Any flood information that is more restrictive or detailed than the FEMA data can be used for flood loss reduction and/or fisheries habitat management purposes, including data on channel migration, more restrictive floodways, maps showing future build-out and global climate change conditions, specific maps from watershed or related studies that show riparian habitat areas, or similar maps.

In the RBZ and the floodplain the following re-development criteria apply:

1) Require that expansion to existing buildings in the floodplain be limited to no more than 10 percent of the existing footprint (i.e., when building and other structures such as garages are substantially damaged or expanded in the floodplain), unless mitigation for any adverse effects to floodplain habitat is provided, as described above .

4. Communities choosing to implement the mitigation option (2.b. above) must track the projects for which they issue floodplain development permits, including effects to flood storage, fish habitat, and all indirect direct of development. The expected development effects, the equivalent mitigation provided, and the success of the mitigation in replacing the affected fish habitat and flood storage functions shall be reported to FEMA on a semi-annual basis (according to the monitoring requirements in RPA element 3.D)

Appendix E. Insurance Rating Table, Unnumbered A Zones

Table 3C is from the October 1, 2009, *Flood Insurance Manual* for insurance agents. This table shows the rates for unnumbered A Zones, i.e., Special Flood Hazard Areas where the Flood Insurance Rate Map does not provide a base flood elevation.

The table shows how much lower flood insurance premium rates are where the community obtains or provides a base flood elevation. For example, for a 1–4 family home elevated one foot above grade, the rate for the first layer of coverage (the first $50,000) is $2.09 per $100 in coverage. $50,000 in flood insurance coverage for the building (no contents coverage) would cost $1,045 (plus $41 in fees).

If the community provides a base flood elevation (as per Sections 3.3.F and 3.5.C of the model ordinance), the rate for the same house elevated one foot above that base flood elevation is $1.06 per $100, roughly half the rate. $50,000 in flood insurance coverage for the building would cost $530 (plus $41 in fees).The rates are even lower for going more than one foot above the base flood elevation and are lower still in communities in the Community Rating System.

TABLE 3C. REGULAR PROGRAM -- POST-FIRM CONSTRUCTION RATES
ANNUAL RATES PER $100 OF COVERAGE
(Basic/Additional)

UNNUMBERED ZONE A -- WITHOUT BASEMENT/ENCLOSURE/CRAWLSPACE[1,6]

Elevation Difference to nearest foot	BUILDING RATES		CONTENTS RATES		TYPE OF ELEVATION CERTIFICATE
	Occupancy		Occupancy		
	1-4 Family	Other & Non-Residential	Residential[2]	Non-Residential[2]	
+5 or more	.35 / .10	.47 / .15	.61 / .12	.64 / .12	NO ESTIMATED BASE FLOOD ELEVATION[3]
+2 to +4	1.08 / .13	.99 / .20	.86 / .17	.97 / .23	
+1	2.07 / .63	2.23 / .74	1.52 / .56	1.45 / .71	
0 or below	***	***	***	***	
+2 or more	.40 / .08	.33 / .09	.50 / .12	.48 / .12	WITH THE ESTIMATED BASE FLOOD ELEVATION[4]
0 to +1	1.05 / .12	.90 / .18	.84 / .16	.83 / .21	
-1	3.45 / 1.29	4.37 / 1.01	2.68 / .69	2.18 / 1.01	
-2 or below	***	***	***	***	
No Elevation Certificate[5]	4.02 / 1.41	5.45 / 1.68	3.33 / .99	3.21 / 1.34	No Elevation Certificate

[1] Zone A building with basement/enclosure/crawlspace/subgrade crawlspace – Submit for Rating.

[2] For elevation rated risks other than Single Family, when contents are located one floor or more above lowest floor used for rating – use .35 /.12.

[3] Elevation difference is the measured distance between the highest adjacent grade next to the building and the lowest floor of the building.

[4] Elevation difference is the measured distance between the estimated BFE provided by the community or registered professional engineer, surveyor, or architect and the lowest floor of the building.

[5] For building without basement, enclosure, or crawlspace, Elevation Certificate is optional.

[6] Pre-FIRM buildings with basement/enclosure/crawlspace/subgrade crawlspace may use this table if the rates are more favorable to the insured.

*** **SUBMIT FOR RATING**

Appendix F. State Floodway Standards

Note that these standards are subject to revision by the State of Washington

WAC 173-158-075 Existing Farmhouse Standards

Repairs, reconstruction, replacement, or improvements to existing farmhouse structures located in designated floodways and which are located on lands designated as agricultural lands of long-term commercial significance under RCW 36.70A.170 shall be permitted subject to the following:

(1) The new farmhouse is a replacement for an existing farmhouse on the same farm site;

(2) There is no potential safe building site for a replacement farmhouse on the same farm site outside the designated floodway or the location requires close proximity to other structures in the farm operation in order to maintain the integrity and operational viability of the farm; in no case shall a replacement be located into an area with higher flood hazards in terms of depths, velocities and erosion;

(3) Repairs, reconstruction, or improvements to a farmhouse shall not increase the total square footage of encroachment of the existing farmhouse;

(4) A replacement farmhouse shall not exceed the total square footage of encroachment of the structure it is replacing;

(5) A farmhouse being replaced shall be removed, in its entirety, including foundation, from the floodway within ninety days after occupancy of a new farmhouse;

(6) For substantial improvements, and replacement farmhouses, the elevation of the lowest floor of the improvement and farmhouse respectively, including basement, is a minimum one foot higher than the base flood elevation;

(7) New and replacement water supply systems are designed to eliminate or minimize infiltration of flood waters into the system;

(8) New and replacement sanitary sewerage systems are designed and located to eliminate or minimize infiltration of flood water into the system and discharge from the system into the flood waters; and

(9) All other utilities and connections to public utilities are designed, constructed, and located to eliminate or minimize flood damage.

WAC 173-158-076 Substantially damaged residential dwellings other than farmhouses.

For all substantially damaged residential structures, other than farmhouses, located in a designated floodway, the department, at the request of the local government, is authorized to assess the risk of harm to life and property posed by the specific conditions of the floodway. Based upon scientific analysis of depth, velocity, flood-related erosion and debris load potential, the department may exercise best professional judgment in recommending to the local permitting authority repair, replacement or relocation of a substantially damaged structure. The property owner shall be responsible for submitting to local government any information necessary to complete the assessment required by this section when such information is not otherwise available.

(1) Recommendation to repair or replace a substantially damaged residential structure located in the regulatory floodway shall be based on the flood characteristics at the site. In areas of the floodway that are subject to shallow and low velocity flooding, low flood-related erosion potential, and adequate flood warning time to ensure evacuation, the department may recommend the replacement or repair of the damaged structure. Any substantially damaged residential structure located in the regulatory floodway in a high risk zone based on the flood characteristics will not be recommended to be repaired or replaced. Flood warning times must be twelve hours or greater, except if the local government demonstrates that it has a flood warning system and/or emergency plan in operation. For purposes of this paragraph flood characteristics must include:

(a) Flood depths can not exceed more than three feet; flood velocities cannot exceed more than three feet per second.

(b) No evidence of flood-related erosion. Flood erosion will be determined by location of the project site in relationship to channel migration boundaries adopted by the local government. Absent channel migration boundaries, flood erosion will be determined by evidence of existing overflow channels and bank erosion.

At the request of local government, the department will prepare a report of findings and recommendations for local government concurrence on repair or replacement of substantially damaged residential structures located in the regulatory floodway.

Without a recommendation from the department for the repair or replacement of a substantially damaged residential structure located in the regulatory floodway, no repair or replacement is allowed per WAC 173-158-070(1).

(2) Before the repair, replacement, or reconstruction is started, all requirements of the National Flood Insurance Program, the state requirements adopted pursuant to RCW 86.16.031(8), and all applicable local regulations must be satisfied. In addition the following conditions must be met:

(a) There is no potential safe building location for the replacement residential structure on the same property outside the regulatory floodway.

(b) A replacement residential structure is a residential structure built as a substitute for a previously existing residential structure of equivalent use and size.

(c) Repairs or reconstruction or replacement of a residential structure shall not increase the total square footage of floodway encroachment.

(d) The elevation of the lowest floor of the substantially damaged or replacement residential structure is a minimum of one foot higher than the base flood elevation.

(e) New and replacement water supply systems are designed to eliminate or minimize infiltration of flood water into the system.

(f) New and replacement sanitary sewerage systems are designed and located to eliminate or minimize infiltration of flood water into the system and discharge from the system into the flood waters.

(g) All other utilities and connections to public utilities are designed, constructed, and located to eliminate or minimize flood damage.