

3.3 Flooding

3.3.1 Affected Environment

Current Plan Area

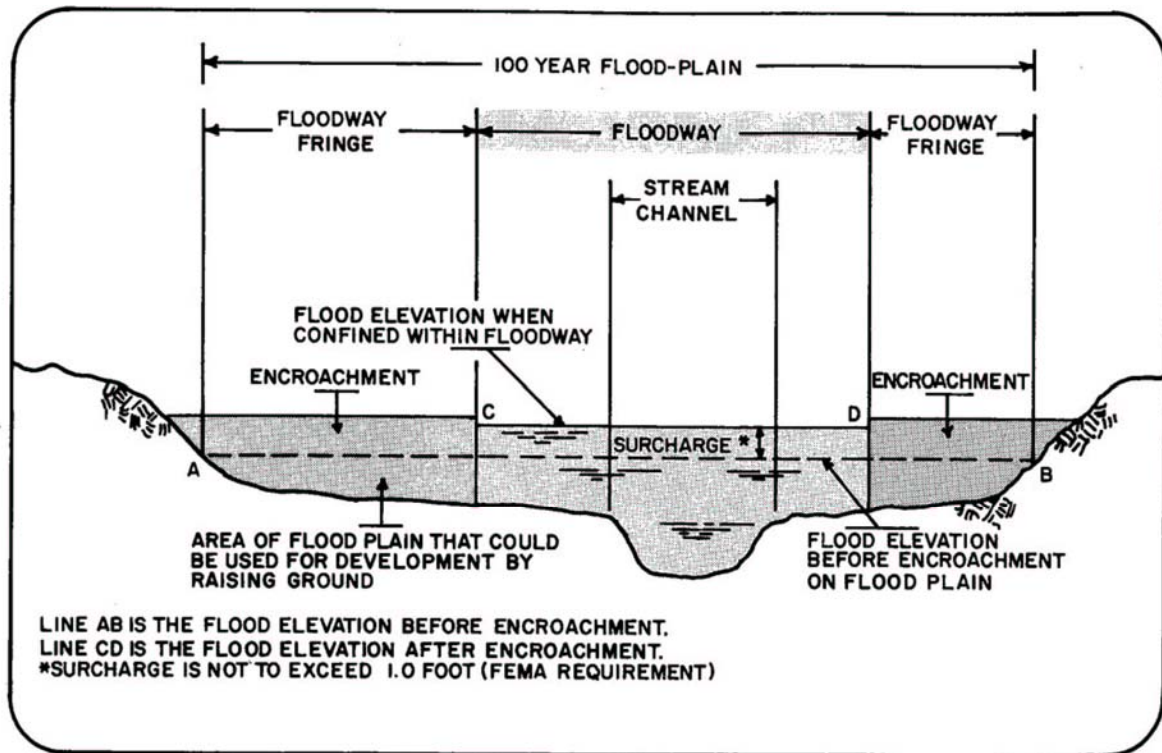
Background

River flows vary with precipitation, snowmelt rates, and other factors, which cause the amount of water draining from a basin to change over time. Most of the water a river carries is contained within the floodway, usually marked in natural channels by steep banks where erosion is occurring or sand bars where sediments are being deposited. When the flows exceed the amount of water that can be carried within the banks, a flood condition exists.

Floods are classified in terms of frequency of recurrence. A 20-year flood is of a size that the predicted recurrence interval is once every 20 years, or the size that has a 5% probability of occurring in any given year. The larger the discharge from the flood, the lower the probability. Often called the base flood, the primary measure of flood potential is the 100-year flood, or the flood elevation that has a 1% probability of occurring in a given year. Washington State Growth Management Act guidelines (Washington Administrative Code 365-190) indicate that the 100-year flood defines “frequently flooded areas.” Recent amendments to the Growth Management Act prohibit adding areas within the 100-year floodplain to an urban growth area (UGA) in most circumstances (Revised Code of Washington 36.70A.110(8)).

When flood conditions exist, water flows over the riverbanks into low-lying areas along the edges of a river. In some cases those areas are immediately adjacent to the channel and flood waters flow at similar rates to water in the channel. The channel and these areas with fast-moving water are defined as the “floodway.” Beyond the floodway, often behind dikes or in higher areas, the flood water is defined a “flood fringe.” Because the flood fringe is usually separated from the floodway, the water has little or no velocity and stores flood water volume. The combination of the floodway and the flood fringe defines the “floodplain.” This is illustrated in Figure 3.3-1.

The Federal Emergency Management Agency (FEMA) determines the risk of flooding and publishes flood insurance rate maps based on the predicted frequency of flooding at a given elevation. Those areas that have a 1% chance of flooding (100-year floodplains) are considered at risk of flood hazard. Figure 3.3-2 shows the preliminary 2009 floodplain map.

Figure 3.3-1. Floodplain Diagram

Source: Federal Emergency Management Agency.

National Flood Insurance Program and the Federal Endangered Species Act

Development within frequently flooded areas, floodplains, and floodways will be affected by changes to the National Flood Insurance Program (NFIP) that are being implemented as a result of a recent lawsuit filed by the National Wildlife Federation et al. versus FEMA. The lawsuit alleged that FEMA was in violation of Section 7(a)(2) of the federal Endangered Species Act (ESA).

In 2004, the U.S. District Court at Seattle issued a decision in favor of the plaintiffs. FEMA and the National Marine Fisheries Service (NMFS) proceeded with a joint evaluation of the effects of the NFIP on endangered species, and NMFS determined that the program, as implemented, would jeopardize the continued existence of Puget Sound populations of salmon and killer whales. The ESA prohibits any federal agency from performing an action that would jeopardize the continued existence of any threatened or endangered species.

NMFS presented seven reasonable and prudent alternatives (RPAs) in its Biological Opinion (NMFS 2008), which is, in effect, a list of new regulations governing how the NFIP may be implemented along streams and rivers that support Puget Sound region salmon populations.

The seven RPAs include the following:

1. **Notification.** By October 22, 2008, FEMA was required to notify all communities participating in the NFIP, within the area covered by the Biological Opinion, that the NFIP implementation is jeopardizing the continued existence of federally protected species. The City of Sumner was one of the communities notified.

2. **Mapping.** This RPA contains a variety of provisions regarding FEMA's mapping program with the intent of improving the accuracy of floodplain mapping so that floodplains can be managed to minimize impacts.
3. **Floodplain Management.** This is the most consequential provision of the Biological Opinion with regard to development. The floodplain management RPA specifies that affected communities:
 - either prohibit all development in the 100-year floodplain, or
 - allow development to proceed only if ecological functions of the floodplain are preserved or compensated (i.e., mitigated).

In effect, it is a policy of "no net loss" of the ecological functions provided by floodplains. The details of how floodplain management is to be implemented include:

- The local jurisdiction must demonstrate to FEMA that any proposed development in the FEMA-designated floodway, the channel migration zone, or the riparian buffer zone does not adversely affect water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refuge for salmon.
 - If development in any other portion of the 100-year floodplain is permitted, any loss of floodplain storage must be avoided, rectified or compensated for (i.e., mitigated).
 - Indirect adverse effects of development in the floodplain (e.g., effect from stormwater, riparian vegetation, channel migration, wetlands) must be mitigated such that equivalent or better salmon habitat is provided.
 - The local jurisdiction must track all projects that occur in the floodplain and report these to FEMA on a semi-annual basis.
 - Construction in the floodplain must use low impact development (LID) methods.
 - Any improvements or repairs to existing structures that result in a greater than 10% increase of the structure footprint must mitigate for any adverse effects on species or their habitat. This limitation significantly changes the threshold for mitigation for improvements to structures in the floodplain, formerly triggered only if the cost of the improvements exceeded 50% of the market value of the structure.
4. **Community Rating System.** This RPA outlines specific changes to the Community Rating System that will decrease the level of impact on floodways from development and incentivize the restoration of floodplain functions.
 5. **Levees.** This RPA addresses vegetation management on levees.
 6. **Floodplain Mitigation Activities.** This RPA is intended to mitigate for effects from any NFIP actions that occur during implementation of RPAs 2, 3 and 5, that would degrade channel or floodplain habitat, including from the indirect effects of development in the floodplains. This RPA identified FEMA as the agency responsible for assuring that mitigation is provided.
 7. **Monitoring and Adaptive Management.** This RPA provides a mechanism to:
 - Check on FEMA's success in meeting the timeline for implementing each element of the RPAs.

- Evaluate whether additional or alternate actions are needed to achieve the same outcomes as the original RPAs.
- Determine whether the NFIP actions have avoided or mitigated effects on salmon habitat in floodplains in the interim period, while the longer-term RPA actions are being fully implemented.

Although FEMA is in the process of revising NFIP maps per RPA 2, above, the previous floodplain maps (1987) for the City of Sumner remain in effect. FEMA (2010) has proposed a habitat review process to evaluate and, if necessary, redesign floodplain development projects that have the potential for adverse effects on habitat. Within the framework of this process, projects that are not allowed under community floodplain ordinances, or that have undergone interagency consultation under ESA would be subject to habitat review.

White and Puyallup River Floodplains

Within the current plan area, the 100-year floodplain includes areas along both the White (Stuck) and Puyallup rivers. The largest areas affected are along the White (Stuck) River in the industrial area. This includes a small portion of the western Fleischmann Yeast site under consideration for the Manufacturing Industrial Center (MIC) designation.

As shown in Figure 3.3-2, the 100-year floodplain includes the western half of the Rivergrove area along the Puyallup River, the northern valley bounded by 137th Ave E, the Burlington Northern Santa Fe railroad, and various sections of land along the Puyallup River south of Sumner.

Although both rivers constitute a flood threat in the current plan area, the Puyallup River is uncontrolled, flowing directly from the glaciers of Mount Rainier, whereas, the White (Stuck) River is partially controlled by the Mud Mountain Dam east of Buckley. The dam provides only partial flood control and is intended to regulate water flow for the lower 3 miles of the Puyallup River to benefit the Port of Tacoma activities. The extent of the floodplain in the draft FEMA map (Figure 3.32) varies slightly compared to the 1987 adopted maps (City of Sumner 2005). The greatest difference, however, is in the area that is designated as floodway. The 2009 preliminary FEMA map extends the White River floodway considerably from the floodway area mapped in 1987, especially between 16th Street E and Puyallup Street (Figure 3.3-2).

The City of Sumner currently implements the floodplain regulations required by NFIP and through the critical areas regulations (Sumner Municipal Code [SMC] 16.58 and 15.52).

The Shoreline Master Program is currently under revision, but will include 200-foot buffers/setbacks in the area of the White (Stuck) River north of the Union Pacific Railroad spur bridge in the northern valley. The buffer is 100 feet from 16th Street North. Non-water-related development is prohibited in these areas, thereby restricting development in flood-prone areas.

Orton Junction Expansion Area

No 100-year flood hazards are mapped in this area.

East Hill Reduction Area

No flood hazards are mapped in this area.

3.3.2 Impacts

Impacts Common to All Alternatives

Flooding is the leading cause of losses from natural disasters in the United States, accounting for 90% of all such damage. The Western Washington floods, which occurred in the winter of 1990, caused over \$200 million in damage to public and private property. The highest peak flood values for the Puyallup River at Alderton (just upstream of Sumner) since 1944, when the current gage was established, were recorded in 1996 (gage height 61.15 feet), 2006 (gage height 60.95 feet) and 2009 (gage height 61.27 feet) (U.S. Geological Survey 2010). The highest peak for the White (Stuck) River (at Auburn) was recorded in 1996 (U.S. Geological Survey 2010).

General human activity often increases the frequency and magnitude of flooding. Increased impervious surfaces such as pavement and rooftops increases the amount and speed of runoff by preventing infiltration into the ground. Structures and fill within floodplains reduce the ability of the floodway to carry water resulting in a raised base flood elevation. Destruction of wetlands and riverside vegetation reduces the ability of plants to slow storm surges and waves. Bankside improvements, often intended to improve localized flood conditions, can create secondary problems such as erosion of other stream banks, increased downstream flooding, and decreased water quality and loss of habitat for fish and wildlife.

Development in the floodway that would increase the base flood elevation would be prohibited, and more recent FEMA requirements could limit the extent of development such as by limiting the extent of impervious surfaces (RPA 3 above). This could reduce development capacity of the industrial area below what has been estimated for the alternatives. For example, considering the M-1 zone only that is applied in the current plan area, a reduction in floor area ratio from 0.26 (assumed in the land capacity analysis) to 0.21 (a figure considered in the City's Manufacturing-Industrial Center [MIC] study) would reduce employment capacity by approximately 1,175 jobs.

Impacts Specific to the UGA Expansion (Orton Junction) Alternative

Because no floodways or floodplains are located in the Orton Junction expansion area, flood impacts would be the same under the UGA Expansion Alternative as described under "Impacts Common to All Alternatives."

The Fleishmann Yeast property in the current plan area would continue to allow for growth in an area that is in part located in the 100-year flood hazard area. The inclusion of the property in the MIC would not increase or decrease that potential flood hazard; however, inclusion in the MIC may lead to changes in development allowances for residential uses in favor of employment-only uses. This would reduce the potential for residents to be located in proximity to the flood hazard.

Impacts Specific to the UGA Modification Alternative

Because no floodways or floodplains are located in the Orton Junction or East Hill areas, flood impacts would be the same under the UGA Modification Alternative as described under "Impacts Common to All Alternatives." The potential for flooding effects on the Fleishmann Yeast property is the same as for the UGA Expansion Alternative.

Impacts Specific to the No Action Alternative

Flooding impacts under the No Action Alternative would be the same as described under “Impacts Common to All Alternatives.”

3.3.3 Mitigation Measures

Incorporated Plan Features

- The *City of Sumner Comprehensive Plan* contains goals and policies related to floodplain development and environmentally sensitive areas. All alternatives retain these goals and policies.
- LID is an innovative approach to stormwater quantity and quality control that mimics the predeveloped hydrology of a project site by using site design techniques that store, infiltrate, evaporate, and detain stormwater runoff. With an LID approach and best management practices, receiving surface water bodies may experience fewer negative impacts in the volume, frequency, and quality of runoff to maintain base flows and more closely approximate predevelopment runoff conditions. Sumner currently has an LID demonstration project and is developing LID guidance material as part of its Stormwater Comprehensive Plan Update. In 2009, the City adopted Comprehensive Plan amendments to encourage LID through incentives and evaluation of the Sumner Municipal Code for opportunities to facilitate LID (City Sumner 2009). All alternatives retain these goals and policies.

Applicable Regulations and Commitments

- The City will continue to implement requirements of the NFIP to protect new development in the floodplains through SMC 15.52.
- Through Chapter 13.48 SMC, the City applies 2005 Ecology stormwater standards to new development of public and private improvements. The City states that stormwater site plans shall be prepared with a requirement for LID practices over standard retention/detention facilities. The City requires documentation of LID practices in each project subject to stormwater requirements.
- The City will continue to cooperate with Pierce County Water Programs with regard to improvements required along the rivers.
- The City will continue to coordinate with Pierce County to participate in emergency planning as outlined in the *Pierce County Comprehensive Emergency Preparedness Plan* (Pierce County 2006).
- The City will continue to enforce the Shoreline Master Program as it exists and as it may be amended, and regulations pertaining to floodplains.
- The City will continue to enforce critical areas regulations pertaining to floodplains (SMC 16.58).
- The City will pursue implementation of mitigation measures outlined in the *Natural Hazard Mitigation Plan* adopted in 2004.

Other Potential Mitigation Measures

- The City could work with the Pierce County Water Programs and state and federal agencies to determine additional measures to protect property along the Puyallup and White (Stuck) rivers and strive to accomplish those improvements in conjunction with new development.
- The City could adopt a zero-rise floodplain standard, which would allow new development in the floodplain only if the developer can show that the new construction would not increase the base flood elevation.
- The City could work to change the operational mandate for Mud Mountain Dam to ensure that it will function as a flood-control structure, thus reducing the area covered by the 100-year flood.
- As a result of NMFS (2008) biological opinion regarding FEMA flood management, future development in the 100-year floodplain will require mitigation to address loss of habitat function associated with that development. To ensure that permit applications meet the requirements of the Federal Endangered Species Act, the City would have the following choices:
 1. Prevent all development in the floodplain and the protected Area.
 2. Enact regulations that allow development that meet the criteria specified in the biological opinion by either:
 - a. Adopting a model ordinance (currently in draft form), or
 - b. Enforcing the same requirements in other ordinances, such as through growth management, zoning, or critical areas regulations.
 3. Require applicants to submit applications for a permit in the Protected Area to National Marine Fisheries Service for review.

3.3.4 Significant Unavoidable Adverse Impacts

New development and creation of paved and covered areas could increase impervious surfaces and the quantity of runoff. New construction in the floodplains in the current plan area will expose some persons and public and private improvements to risk of water and other related damages. The Orton Junction expansion area, considered for inclusion in the UGA under the action alternatives, is not located in the 100-year flood hazard area.

