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TO: Thurston County Planning Commission

FROM: Claire Swearingen, Associate Planner

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SUBJECT: Frequently Flooded Areas BAS and Discussion

Introduction

Frequently flooded areas (FFAs) are parts of the landscape that are known to flood often. Specifically, they are defined in WAC 365-190-030(8) as:

"...lands in the flood plain subject to at least a one percent or greater chance of flooding in any given year, or within areas subject to flooding due to high groundwater. These areas include, but are not limited to, streams, rivers, lakes, coastal areas, wetlands, and areas where high groundwater forms ponds on the ground surface."

Thurston County's current definition of FFAs (TCC 24.03) expands on the WAC definition by including areas within the highest known level of flooding, usually called the "flood of record." The current County definition specifically references flood insurance rate maps (FIRMs) published by the Federal Emergency Management Agency (FEMA) for Thurston County. At minimum, the Washington State Dept. Of Commerce requires local jurisdictions to regulate areas designated as 100-year floodplains by FEMA and the National Flood Insurance Program (NFIP). Washington State Dept. Of Ecology and Dept. Of Commerce recommend that jurisdictions also consider other flood hazard areas like the flood of record and high groundwater hazard areas.

Base Flood

As noted in the above definitions, FFAs include many types of flood hazard which occur in different parts of the landscape. The base flood is another term for the 100-year floodplain. These areas have a 1% chance of flooding each year, meaning they are expected to flood about every 100 years. Floodways are areas in stream or river channels that are necessary for discharging base floods. Development in floodways must be regulated to ensure it does not increase the base flood elevation (BFE), which is the height of the 100-year flood. The regulations are intended to ensure development does not expand the 100-year floodplain larger. FEMA flood maps include these, and other more granular designations of flood hazard areas. Major rivers in Thurston County associated with flood hazards include the Black, Chehalis, Deschutes, Nisqually, and Skookumchuck Rivers, as well as Scatter Creek. Thurston County also monitors the water levels for Long Lake and Lake St. Clair due to their potential to damage property in floods.

Other Flood Types

High groundwater hazards areas exist where the water table is very close to the surface, or where subsurface geology creates surface pooling of groundwater on a regular basis. Flood of record maps indicate where flooding has been known to happen in the past. Flood of record maps may indicate flood areas with a wide range of annual probability. Channel migration zones are areas along streams and rivers which the main watercourse may occupy in the future, as the morphology of the river or stream changes. Channel migration is a naturally occurring process that can be impacted by human activity. Coastal flooding can occur with strong tides and storm surges, causing flooding along the Puget Sound shoreline, and in delta areas. While this type of flooding does not currently pose a severe risk in Thurston County, climate change and sea level rise will increase risk over time, according to the Thurston County Flood Hazard Management Plan (FHMP).

Functions and values

Floodplains play an important role in dynamic hydrologic processes that support habitat for fish and wildlife, as well as human safety. The unique morphology of floodplains helps to protect aquatic species during high-flow events and helps to safely disperse floodwaters. Flood events also help mobilize and disperse streambed sediments and facilitate channel migration. Floodplains often overlap with other critical areas like Fish and Wildlife Habitat Conservation Areas, Wetlands, and Critical Aquifer Recharge Areas due to their capacity to support wildlife habitat and recharge aquifers. Floodplains also help distribute woody debris (i.e. fallen trees and branches) into streams and rivers, which helps to create high-quality fish habitat. Disturbances in floodplains can negatively impact stream morphology, water quality, fish habitat, and the natural processes that help maintain healthy riverine ecosystems.

Hazards, FEMA, and CRS

Floods are the most costly and damaging hazard in Washington State, according to the Department of Ecology, and cleaning up after a flood is much more expensive than avoiding flood impacts. Flood hazards have been complicated by a history of flood management that has focused on engineered changes to channel morphologies, like levees, dams, and channelization projects. Development in floodplains has disconnected rivers and streams from their hydrological and geological context, reducing the ability of floodplains to function naturally, and severely impacted riparian and aquatic habitat quality. The urbanization and development of watersheds has also impacted the functions of floodplains and increased the potential for floods to cause damage and harm. Current best practices focus on leaving adequate undeveloped space for rivers and floodplains to perform their ecological functions naturally, and without undue impacts to human safety and property.

Thurston County participates in FEMA's Community Rating System (CRS) program, which is part of the National Flood Insurance Program (NFIP). CRS credits certain community policies and activities that

go above and beyond the minimum requirements for participating in the NFIP. According to the Thurston County FHMP, the County participates in credited activities in the following categories:

- Mapping and flood data
- Managing new development to minimize future flood damage
- Reducing flood losses to existing development
- Improving emergency preparedness and response
- Implementing public information activities

Thurston County has a Class 2 CRS rating, which is awarded based on robust flood planning and mitigation efforts. CRS ratings range from 1 through 10, with 1 being the highest level of credited activity. There are only nine jurisdictions with a rating of Class 2 or higher. The County's Class 2 rating entitles flood insurance policy holders to major discounts on their policies, and the countywide annual savings on flood insurance total to $372,397.

The CAO supports the County's high CRS rating by limiting development primarily in the floodway and the 100- and 500-year floodplain. Some credit is also given based on protections for high groundwater hazard areas and flood of record areas.

Climate Change

Flood events are highly susceptible to the changes in precipitation patterns associated with climate change. Climate change is likely to continue to cause more intense rainfall events in the wet season, and drier, hotter summers. Increased heavy precipitation events can also increase the severity, risk, and frequency of flood events. As the frequency and intensity of flood changes, it may become necessary to look beyond the 100-year floodplain, as events previously considered to be 100-year floods or 500-year floods become more common.

Climate change is also linked to sea level rise, which is an emerging threat in coastal areas. While Thurston County does not currently experience a high level of risk from coastal flooding, sea level rise combines with the potential increase in intensity and frequency of storm surges may pose a risk to coastal areas in the future.

The primary source for flood hazard mapping are FEMA maps, but these maps do not consider climate change, sea level rise, or channel migration zones. Resources from other agencies like the Washington Silver Jackets, USGS, the WA Dept. Of Ecology, NOAA, the University of Washington Climate Impacts Group and more can help support areas not covered by FEMA maps and improve flood protections in Thurston County.

Protection Strategies

Flood risk management is a systematic and complex effort. The role of the CAO in this effort is to identify and designate frequently flooded areas and regulate, condition, and limit new development in those areas. The FHMP highlights the CAO as one of the County's strongest tools to protect against flood hazards. Baseline requirements for the CAO are informed by the National Flood Insurance Program (NFIP), FEMA maps, the WA Dept. Of Commerce and Washington State law, and the federal agency Biological Opinion published by the National Maring Fisheries Service.

Generally, the CAO must ensure that no new development or expansion of development in floodplains or floodways creates a net rise in base flood elevation, a net loss of ecological function, and for rivers and streams that connect to the Puget Sound, impacts to salmonid species or resident Orca populations.

There are engineering solutions and building standards that allow some construction in FFAs, but these options are limited and must still meet the requirements to protect habitat and ecological function. Much of the County's CRS credits come from prohibiting development in certain FFAs. Any changes to allowed uses or administrative procedures should consider impacts to CRS.

Discussion

- Mapping and designation resources
    - As discussed above, not all areas at risk for flooding are considered in FEMA mapping. Which, if any, other maps or data resources should inform the CAO?
- FFA Types and Designations
    - At baseline, the CAO must consider FFAs as designated by FEMA and defined in WAC 365-190-030(8). Other areas, like coastal flood zones, channel migration zones, and the 500-year floodplain are up to the County's discretion to regulate.
- Flexibility and Protection
    - Permitting staff recommends that the CAO update consider options for flexibility for certain projects. Some relief to permit applicants and county staff could be provided by allowing certain projects to get an administrative RUE, rather than going through the hearings examiner, or through other changes to permitting or special report requirements and processes.

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