

**CITY COUNCIL AGENDA ITEM**  
CITY OF SHORELINE, WASHINGTON

<b>AGENDA TITLE:</b>	Thornton Creek FEMA Floodplain Map Revision
<b>DEPARTMENT:</b>	Public Works Department
<b>PRESENTED BY:</b>	Jesus Sanchez, Operations Manager Brian Landau, Surface Water and Environmental Services Supervisor

**PROBLEM/ISSUE STATEMENT:**

The residential area south of Ronald Bog is part of the larger North Fork of Thornton Creek drainage basin and has historically flooded during significant storm events. Most recently this neighborhood was severely flooded during the December 3, 2007 rainstorm, which was greater than a 100-year storm. Early in 2008, staff presented to Council proposed solutions to this issue, and a series of capital projects were undertaken. Staff presented an update on those projects in September 2009.

This report and presentation to Council will be an update on the final stages of the capital projects and a briefing on the process to update the Flood Insurance Rate Maps (FIRM) within the Thornton Creek basin. These "flood plain" maps are part of the National Flood Insurance Program (NFIP) for which the City of Shoreline is a member and are administered by the Federal Emergency Management Agency (FEMA). NFIP is the national flood insurance program that offers low rate flood insurance to all properties within participating cities.

**FINANCIAL IMPACT:**

No Financial Impact

**RECOMMENDATION**

No action is required by the City Council at this time. This report is to provide the City Council with an update of the North Fork Thornton Creek FEMA Floodplain Mapping status.

Approved By:      City Manager  City Attorney \_\_\_\_\_

## **INTRODUCTION**

On December 3, 2007, a storm dropped more than four inches of rainfall in about 21 hours on the City. Public Works crews responded to hundreds of calls from residents. This rainfall amount exceeded the 100-year<sup>1</sup> event, and thereby exceeded the design capacity of the stormwater infrastructure. The volume of runoff from this storm entering Ronald Bog was more than 20 acre-feet above flood stage. Consequently, flooding occurred in the residential area south of Ronald Bog. These homes were flooded with up to three feet of water for a second time in 11 years.

In 2008, City staff pursued several CIP solutions to mitigate flooding in the Ronald Bog area. The City, through contracted work, completed the replacement of the street drainage on the west side of Corliss Avenue N, between 171<sup>st</sup> and 172<sup>nd</sup> Streets, and removed the three restrictive culverts along Corliss Place, replacing them with fish passable boxes. In addition, the Cromwell Park Surface Water Enhancement Project (constructed in 2009-2010) also provided some flood reduction relief to the north branch of the Thornton Creek basin.

In 2010, the outlet pipe for the bog was replaced and a short flood wall was installed to prevent surface flows from draining into the neighborhood. All of these capital improvements reduced the risk of flooding; however, they were only part of a greater floodplain management strategy for North Fork Thornton Creek to reduce flood risk and hazards to those in the creek's floodplain. The other key components are the Ronald Bog early flood warning system and floodplain mapping.

The FEMA floodplain map revision of the North Fork of Thornton Creek will improve the accuracy of floodplain locations, thereby allowing the City to meet the full intent of the City's existing floodplain ordinance and for the City to meet our obligation as a member of the NFIP. Floodplain maps (FIRM) also protect the interests of present and future private property owners as property is sold and developed.

## **BACKGROUND**

The neighborhood to the south of the present day Ronald Bog Park was originally part of a peat bog. The area was platted for residential use by King County in 1955 and homes were built on fill not long afterwards. Construction of Interstate 5 began in the area in the early 1960's and the fill from the construction was used to reduce the open water portion of the bog (see Attachment A). Sometime after the construction of I-5, the bog began being used as a regional stormwater facility for which it was directly connected to Thornton Creek; bogs are usually isolated and are only connected to other surface waters through groundwater flow.

Historically, Ronald Bog did not provide adequate storage volume to prevent downstream flooding during significant storms (i.e. 25 to 100+ year events). The Ronald Bog outflow pipe and downstream channel had inadequate capacity and gradient. As a

---

<sup>1</sup> Statistical measure for frequency of a storm event; 1 percent chance every year for a storm of this magnitude.

result, the Bog overtopped its banks during these severe storms. In the past, as many as 20 homes have been significantly flooded. Some homes have been inundated with up to two feet of water above their finished floor elevations, causing significant damage. The four most recent floods include January 18, 1986, January 1, 1997, October 2, 2003, and December 3, 2007.

A long-term solution to mitigate flooding to the fullest extent practicable required an understanding of the entire Thornton Creek basin from the headwaters up to and beyond the City's legal boundary. Based on the historical nature of Ronald Bog as a bog, groundwater/surface water interactions had to be considered when analyzing potential flood reduction projects and developing long-term solutions. Thus, the City completed a Thornton Creek Basin Plan (TCBP) in 2009, which included a detailed survey analysis to ascertain and delineate the floodplain area, including the residents immediately south of Ronald Bog.

Additionally, in 2008, the City contracted with Northwest Hydraulic Consultants (NHC) to perform a floodplain mapping study of the north branch of Thornton Creek from Ronald Bog south to the City boundary. The purpose of the study was to delineate the flood hazard boundaries of the creek, thereby providing neighboring residents with the most current information available regarding their flooding risk. The creek was surveyed where rights-of-entry were available, and the stream geometry was coded into a HEC-RAS hydraulic computer model. The model was simulated with the standard FEMA discharge quantities of the 10-, 50-, 100-, and 500-year events. These flows were determined using a detailed hydraulic model of the Thornton Creek basin within the city limits.

A preliminary 100-year floodplain map has been prepared (See Attachment B). The floodplain mapping study was completed in December 2009. In the winter of 2011 (1<sup>st</sup> quarter), the City will notify those residents most likely to be affected by the changes in the floodplain mapping and submit the study to FEMA for incorporation in the national flood insurance database. Once the preliminary map is approved by FEMA and goes through a public comment period, the designated floodplain will be regulated through the development code and building permits, and the distribution of the floodplain map to affected residents will educate and prepare the neighbors of the North Fork Branch of Thornton Creek.

#### **Public Information:**

FEMA Floodplain designation studies are not everyday studies that are easily understood; rather they are highly technical engineering studies that even challenge the understanding of technical professionals. As a result, it is very important that the communication of the flood risks and flood insurance information from these studies is presented to residents in a manner that is clear, concise, understandable.

As part of the basin plan development in 2008 and 2009, the City hosted several public meetings with the residents residing within the Ronald Bog area, which included a discussion and review of the draft floodplain mapping efforts. Surface Water Staff and FEMA representatives attended one of the meetings to discuss the implications of the floodplain mapping. Specifically, FEMA explained to residents their rights and

responsibilities with respect to residents living in a floodplain and discussed flood insurance and flood hazards. In addition, FEMA staff discussed flood insurance eligibility, costs, and benefits of the program. Finally, a Frequently Asked Questions brochure and other Flood Plain Management informational packets were handed out along with names and numbers to contact at FEMA for further information.

Surface Water staff will be notifying residents who are likely to be affected by the change in the flood insurance rate study map to inform them about the potential changes in the flood insurance requirements for their properties. They will be encouraged to contact our office and to set up meetings with Surface Water staff to review once again their rights and responsibilities and to provide any other assistance they might need relative to this process.

### **PURPOSE OF FEMA FLOODPLAIN MAPS**

A floodplain is the part of the land where water collects, pools, and flows during the course of natural events. Such areas are classified as Special Flood Hazard Areas (SFHA), and are located in a 100-year flood zone. The likelihood of a flood occurring within a 100-year stretch of time is very, very high, but there is no way to predict when the next flood will occur – or the one after that. The redrawn maps for the North Fork Thornton Creek indicate the floodplain as a “high-risk” area. In addition, a current FEMA flood study on the Puget Sound coastal areas of King County will create a designated flood hazard area for some Shoreline residents who live adjacent to Puget Sound.

Flood hazard maps, also known as Flood Insurance Rate Maps (FIRMs), are important tools in the effort to protect lives and properties in Shoreline. Although there is a FEMA floodplain designation for Boeing Creek, this is the first floodplain study in the City that establishes flood elevations for the 100-year flood zone. Prior to this study, there was no designated floodplain for the North Fork Thornton Creek. Flood hazard maps indicate the risk for flooding along specific creeks and rivers in every community that has mapped floodplains. The current maps for Shoreline are out of date. As a member community in the National Flood Insurance Program (NFIP), the City is obligated to submit a flood study to FEMA that changes a Flood Insurance Rate Map. The major creeks and Puget Sound shoreline in the City have never been mapped by official studies. Over time, water flow and drainage patterns have changed dramatically within the City due to changes in land use (i.e. development).

New digital mapping techniques will provide more detailed, reliable and current data on flood hazards within the City. The result: a better picture of the areas most likely to be impacted by flooding and a better foundation from which to make key decisions. Floodplain mapping of the major creeks in Shoreline will be a major element of the basin planning process that is proposed in the Surface Water CIP.

## **BENEFITS TO THE CITY AND ITS RESIDENTS**

Numerous properties will be affected differently by these map changes. There will be some properties that aren't affected – their risk remains the same. Other properties will now be mapped into a higher-risk area and/or show a new Base Flood Elevation. Based on the preliminary floodplain map, there are about 10 properties within the City that will show some change into a high hazard area. Flood maps refer to areas of high, medium or low risk as "flood hazard zones" and the zones of highest risk as "Special Flood Hazard Areas."

When new maps are officially adopted, flood insurance will be required if structures are mapped into a high-risk area and have a mortgage with a federally-regulated lender. If a property is mapped into a low-or moderate-risk area, the property owner is not required to purchase or maintain insurance, but are strongly encouraged to do so. The cost of properly protecting your home and contents from flood damage is far less expensive than the cost to repair or replace it after a flood has occurred. The National Flood Insurance Program (NFIP) has "grandfathering" rules to recognize policyholders who have homes constructed in compliance with the flood map in place at the time of construction or who maintain continuous coverage. These rules allow such policyholders to benefit in the premium rating for their building (i.e., reduced flood insurance rate). In the past two years, the City has strongly recommended that residents in the Ronald Bog neighborhood purchase flood insurance.

The benefits of Flood Hazard Maps include:

- Community planners and local officials will gain a greater understanding of the flood hazards and risks that affect Shoreline and can therefore improve local planning activities.
- Builders and developers will have access to more detailed information for making decisions on where to build and how construction can affect local flood hazard areas.
- Insurance agents, insurance companies, and lending institutions will have easy on-line access to updates and upcoming changes in order to serve their customers and community more efficiently.
- Home and business owners will have the ability to make better financial decisions about protecting their properties.
- The sale of property and full disclosure of past problems are more easily disclosed through updated flood insurance maps.

### **Next Steps**

The City will submit the preliminary study to FEMA in February 2011. Once FEMA reviews the map, FEMA will release a draft FIRM map to City officials and the public in late 2011, at which point the map is still preliminary. The process that leads to final adoption can last as long as a year.

More specifically, the initial release of the preliminary map by FEMA is followed by a short review period by community officials to confirm the released map is consistent with the map initially submitted to FEMA. Then there is a 90-day "Public Comment Period" which allows the public to provide comments to FEMA on the preliminary map. The final FEMA review and adoption process is expected to begin between September

and December 2011 and the date of adoption into the National Flood Insurance Program is approximated for some time in 2012. Once the maps are adopted, new flood insurance requirements will become effective for those residents with structures in the high hazard areas.

### **RECOMMENDATION**

No action is required by the City Council at this time. This report is to provide the City Council with an update of the FEMA floodplain map revision process.

### **ATTACHMENTS:**

Attachment A – 1953 Ronald Bog Aerial Photo with Current Street Configuration  
Attachment B – Draft of 100-year Thornton Creek Floodplain Map

[illegible]

# Attachment B: DRAFT Floodplain Map - North Branch Thornton Creek

