

Timberworks Resiliency and Restoration Master Plan - Executive Summary



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ACKNOWLEDGMENTS

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EXECUTIVE SUMMARY

The cities of Aberdeen and Hoquiam have established a partnership to create a plan for reducing the risk of flooding in their communities. Through the TimberWorks planning process, they have taken a multiple benefits approach to reducing flood risk while also enhancing fish habitat, increasing recreation and open space opportunities, and promoting economic development. This planning process complements and supports the ongoing economic revitalization efforts for the community, including the Vision 2020 effort and the Downtown Aberdeen Revitalization effort as well as land use plans such as the cities' comprehensive plans and shoreline master programs. Protecting properties from water damage, reducing the financial costs of flooding, and enhancing the physical character of the community are foundational to economic and community development.

IMPACTS OF FLOODING

Flooding in the fall and winter months has long been a part of living in the cities of Aberdeen and Hoquiam. As low-lying coastal communities set between the foothills of the Olympic Mountains and Grays Harbor, they experience heavy rainfall, snowmelt, and tidal fluctuation. As far back as the 1930s, an earthen levee was constructed around downtown Hoquiam. Since then Aberdeen and Hoquiam have made a number of significant public infrastructure investments to reduce flood risk, including constructing a series of flood-control structures, most recently the South Aberdeen levee; and converting old sanitary sewer system pipes into a stormwater system to convey runoff to the Wishkah, Hoquiam, and Chehalis rivers. Private-property owners and businesses have also made investments, such as elevating structures, operating pumps, and building floodwalls to protect their assets.

Residents and businesses have accepted and dealt with nuisance flooding for decades. However, in the last few years the physical and financial impacts of flooding have increased to a higher level that demands a proactive response. On January 4 and 5, 2015, over 8 inches of rain fell in Aberdeen and Hoquiam in a 24-hour period. This intense rain event overwhelmed the stormwater drainage system. Standing water was reported to be over 2 feet deep in some streets. The heavy rain led to landslides on steep bluffs along Queets Avenue and other locations. Grays Harbor County and the cities of Aberdeen and Hoquiam unsuccessfully applied for federal disaster declaration following the event. The Coastal Community Action Program worked with over 420 families impacted by the flood and the ensuing mudslides.¹

¹City of Aberdeen press release: <http://www.aberdeenwa.gov/continuing-flood-recovery/>.

The National Flood Insurance Program has undergone a fundamental change since 2012. A series of laws have directed the Federal Emergency Management Agency (FEMA) to increase flood insurance premiums to reflect full risk rates. For some property owners in Aberdeen and Hoquiam, these policy changes have led to monthly flood insurance premiums as large as their mortgage payments. They have also made it difficult to buy and sell property in the community. Property owners in the two cities will pay approximately \$2.3 million in flood insurance premiums in 2016. This one year total of premiums represents nearly half of the approximately \$5.5 million of losses paid on flood insurance claims over the 30+ years since the inception of the programs in Hoquiam (1979) and Aberdeen (1984).

The extensive damage caused by the January 2015 storm and the financial hardship created by the increase in flood insurance rates have changed flooding from a nuisance that the community had come to terms with to one of the highest priorities for public safety and economic development.

DRIVERS OF FLOODING

There are two distinct types of flooding events in Aberdeen and Hoquiam: coastal floods and localized floods. Coastal floods are driven by extreme high tides, low-pressure systems, wind, and waves that cause the waters of Grays Harbor to push upstream and above the riverbanks. Even though water may be pouring into the communities from the Wishkah and Hoquiam rivers during coastal flood events, the rivers are flowing upstream at that time and the driver of the high water is coastal conditions. The 100-year floodplain established by FEMA is based primarily on the coastal flood.

Localized flooding is caused by high-intensity rain events that overwhelm the stormwater drainage network. These localized floods are exacerbated by high groundwater during the fall and winter months. During these events, stormwater drain pipes are surcharged and water can sometimes be seen rising up out of catch basins. The January 2015 event is a prime example of localized flooding. Soil erosion and landslides worsen these flood events. Sediments eroded from the foothills is carried by stormwater runoff downhill and into streams and catch basins. The sediment then settles out in the catch basin and stormwater conveyance pipes and clogs the system, reducing the capacity to drain stormwater toward the rivers.

These two types of flood events can interact to create complex conditions. For example, high-intensity rain events can occur during high tides. The stormwater drainage system may not be able to pump water out of the

conveyance pipes against the pressure of the tides. The pipes are then surcharged and stormwater runoff has no way to drain.

MULTIPLE BENEFITS APPROACH

The TimberWorks plan takes a multiple-benefits approach to projects. The intent is to explore opportunities to leverage investments in flood-risk-reduction efforts to achieve other benefits such as water quality improvements and habitat enhancement, as well as community and economic development.

ACTION PLAN

A set of recommended programs and projects has been developed based on the assessment of causes of flooding, opportunities for habitat enhancement, public benefits, and the concerns and ideas expressed by community members. Because flooding impacts so many parts of the community and is driven by multiple factors, there is no single silver bullet solution to the challenge facing the community. This plan proposes a set of interrelated programs and projects that can be implemented in multiple locations across the community and that, collectively, will contribute to reducing flood risk while also providing other benefits. While some projects are large-scale public works projects, a number of small-scale, low-cost actions are also recommended that can be implemented by individual property owners or city staff without external funding or technical assistance.

The projects have been organized based on geographic areas to address the varied challenges and opportunities of different sections of the cities. Four recommendations apply across both cities:

Maintenance: Continuing regular maintenance of the stormwater drainage system

Rainwater Storage and Reuse: Providing small scale distributed storage of rain water through cisterns

Urban Forest Canopy: Increasing the tree canopy in the developed area of the cities to intercept precipitation and draw down groundwater

Conveyance System Analysis: Computer modeling analysis of the Aberdeen storm drain system to pinpoint constraints in conveyance pipes

Proposed projects for specific sections of the cities are identified in the following figures. They include a combination of types of projects, including:

Protection of Forested Lands—Keeping land in the upper end of drainage basins in forest cover reduces stormwater runoff and erosion of sediments that clog the storm drain system in the lowlands.

3-1 4-1 5-5

Storage—Flood control parks and green stormwater management techniques that provide storage of floodwaters in basins that also serve as public parks spaces, such as Franklin Field.

1-2 2-3 4-2 4-3

Reconnection of Creeks to Floodplains—Urban creeks in the cities have generally been straightened and constrained by undersized culverts. Habitat-enhancement projects are envisioned that connect creeks to a limited floodplain “bench,” add native vegetation, and increase the size of culverts. These changes can increase the conveyance of high flows through these creeks, provide lands where floodwaters can overflow and settle out sediments, and increase habitat function for fish and wildlife. Creek enhancements can also include public trails and open space.

3-2 4-7 5-2 6-1 6-2

Increased Capacity of Built Storm Drain System—The aging storm drain system is generally undersized to convey the volume of runoff from large storms. The system also has limited capacity to drain when high tides prevent water from flowing out of the outfall pipes. Increasing pipe size in key areas, as well as the size and configuration of outfall pumps, will increase the capacity of the system. These infrastructure projects are inherently costly, so this report recommends targeting projects in areas that have recurring flooding problems, such as around Ramer and K Streets in Hoquiam and the outfall pump for the basin that includes Cherry Street.

1-5 2-4 2-6 4-4

Levee System—A system of levees and floodwalls appears to be the only feasible way to protect the low-lying areas from coastal floods. Since the coastal flood is the driver for the flood insurance rate maps, construction and accreditation of these levees will have the economic benefit of removing the requirement for property owners to obtain flood insurance.

1-4

2-5

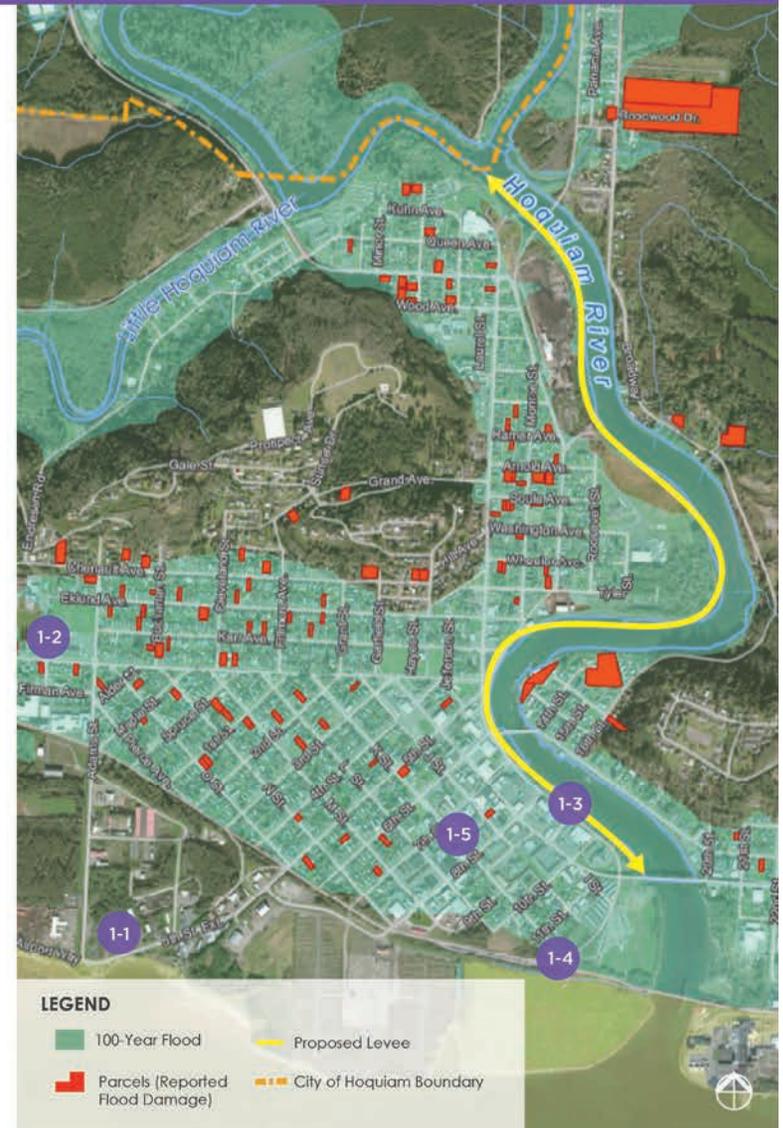
5-4

The Advisory Committee and the community provided recommendations for priority projects to initiate in the short term. The cities of Aberdeen and Hoquiam have already successfully obtained funding to move several of these projects forward:

- North Shore Levee—the design process is under way and grant funding for completing the design and permitting has been identified by the Chehalis River Basin Flood Authority.
- Fry Creek—the City of Aberdeen has obtained \$500,000 in grant funds for engineering design from the Chehalis River Basin Flood Authority and Washington Coastal Restoration Initiative.
- Drain System Conveyance and Pump Upgrades—the City of Hoquiam has received a grant for \$1.3 million from the Chehalis River Basin Flood Authority to upgrade the Ramer Street storm drain lines and pump station.
- Flood Control Parks and Rainwater Capture and Reuse—Rain barrels and cisterns can be installed on private and public properties and stormwater storage basins can be incorporated into public spaces in multiple locations to provide cost effective flood storage without extended design and permitting timelines.

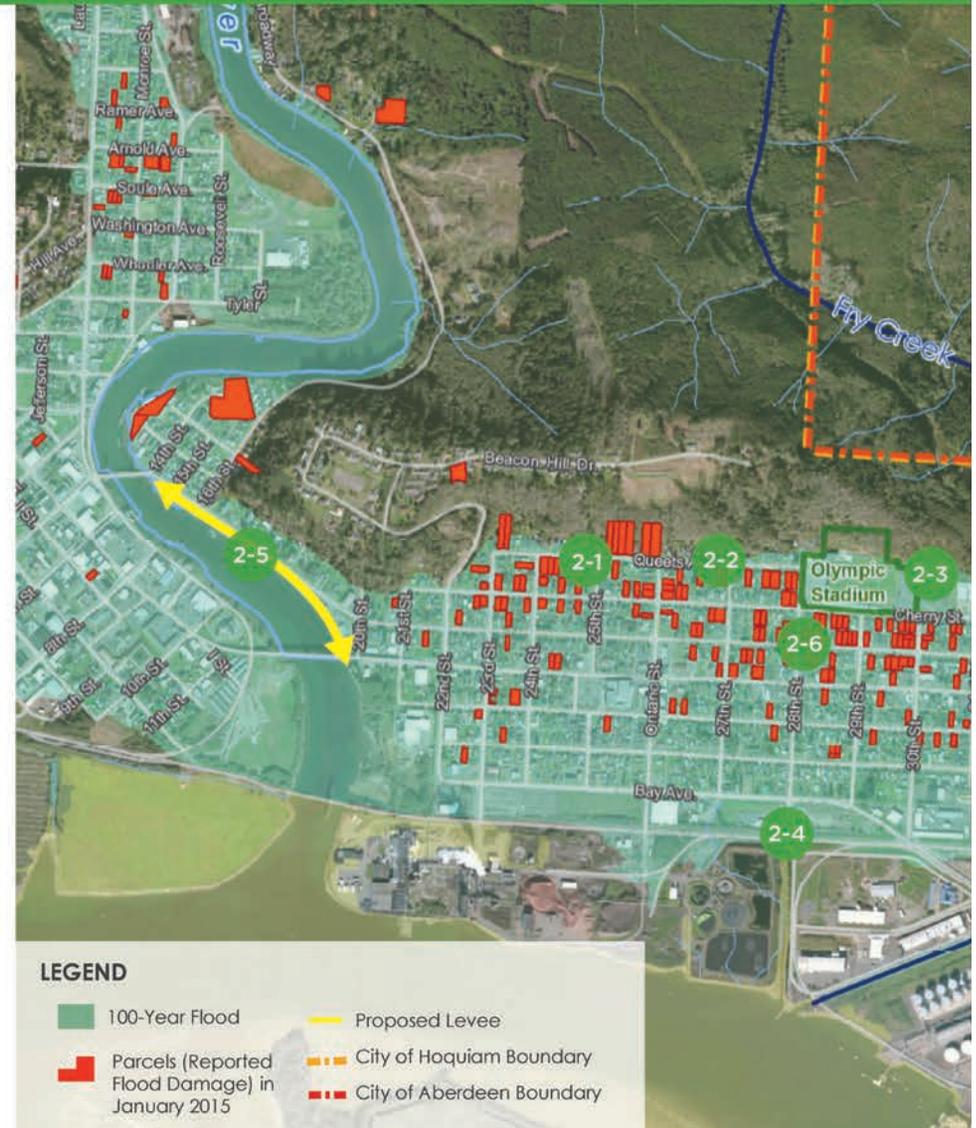
Focus Area 1: West Hoquiam

Project	Cost
1-1 Moon Road Shoreline restoration and floodwall	MED
1-2 Bioretention Retrofits Hoquiam Middle School and Emerson Avenue Triangle Parks	MED
1-3 Enhance and Certify Levee	MED
1-4 Upgrade Outfall Pumps Priority: K, Ramer, & 10th Street pumps	HIGH
1-5 Upgrade Storm Drain Priority: K Street and Ramer Avenue	HIGH



Focus Area 2: East Hoquiam

Project	Cost
2-1 Cherry and Queets Streets Green streets	HIGH
2-2 Property Acquisition Queets Street: landslide-prone homes	MED
2-3 Flood Control Park Adjacent to Olympic Stadium	MED
2-4 Upgrade Stormwater Outfall Pumps	HIGH
2-5 North Shore Levee Along Hoquiam and Chehalis Rivers	HIGH
2-6 Upgrade Storm Drain Capacity	HIGH



Focus Area 3: Fry Creek

Project

Cost

3-1 Land Conservation in Upper Watershed

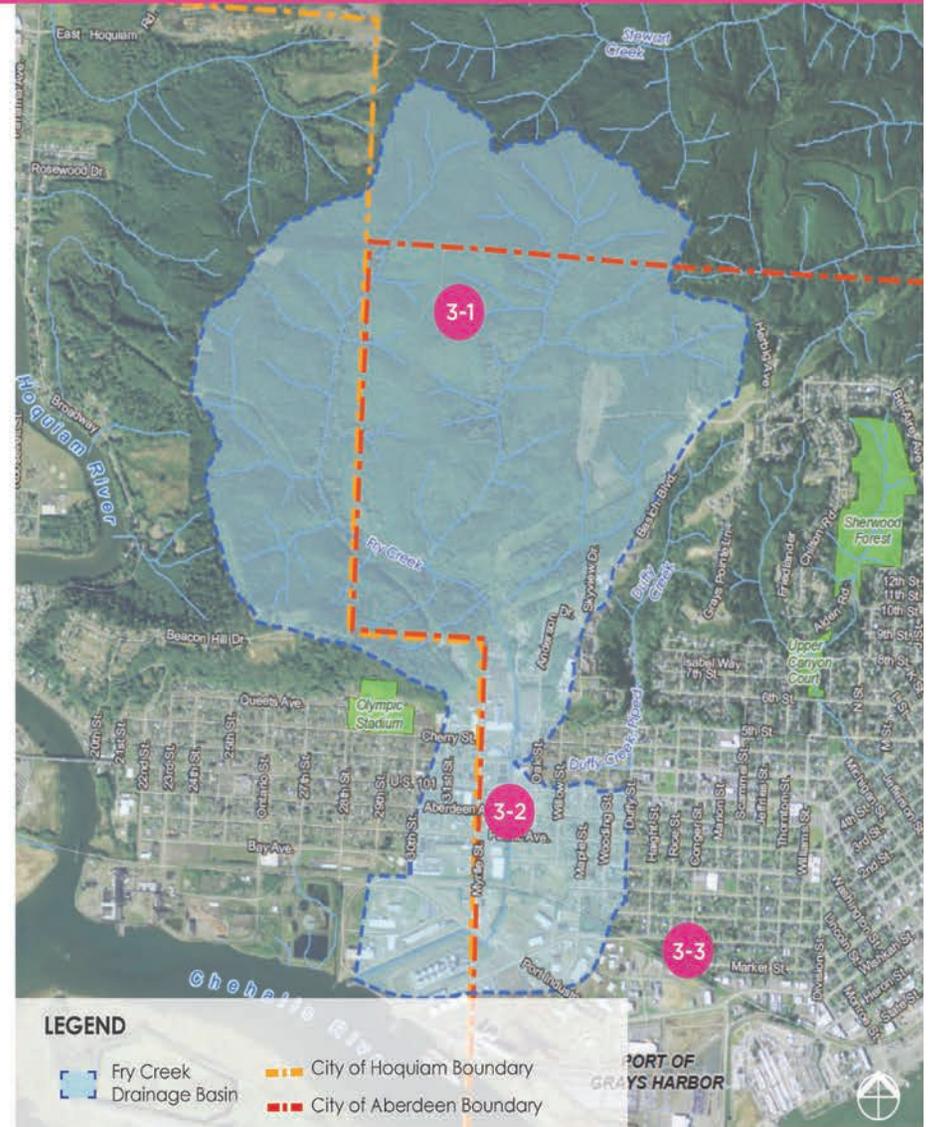
MED

3-2 Fry Creek Restoration and Flood Reduction

MED

3-3 West End Play Field
Flood control feature

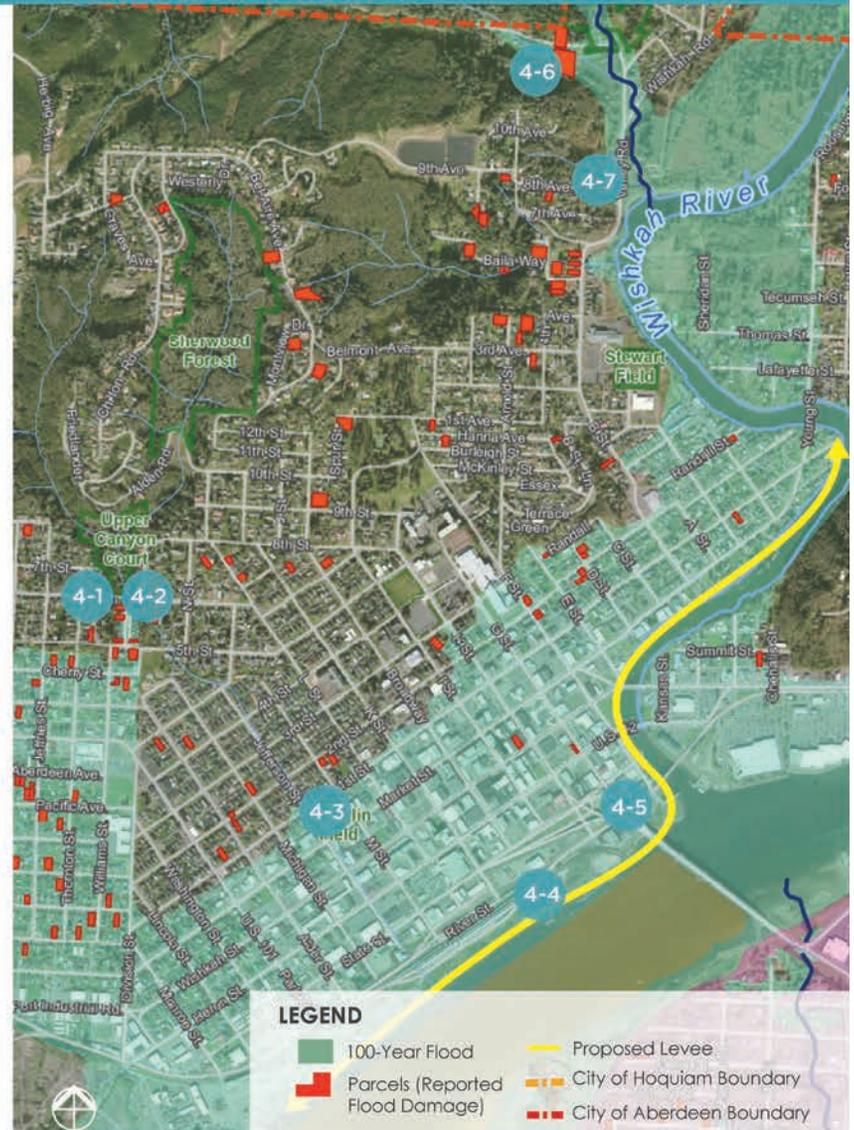
MED



Focus Area 4: West Aberdeen

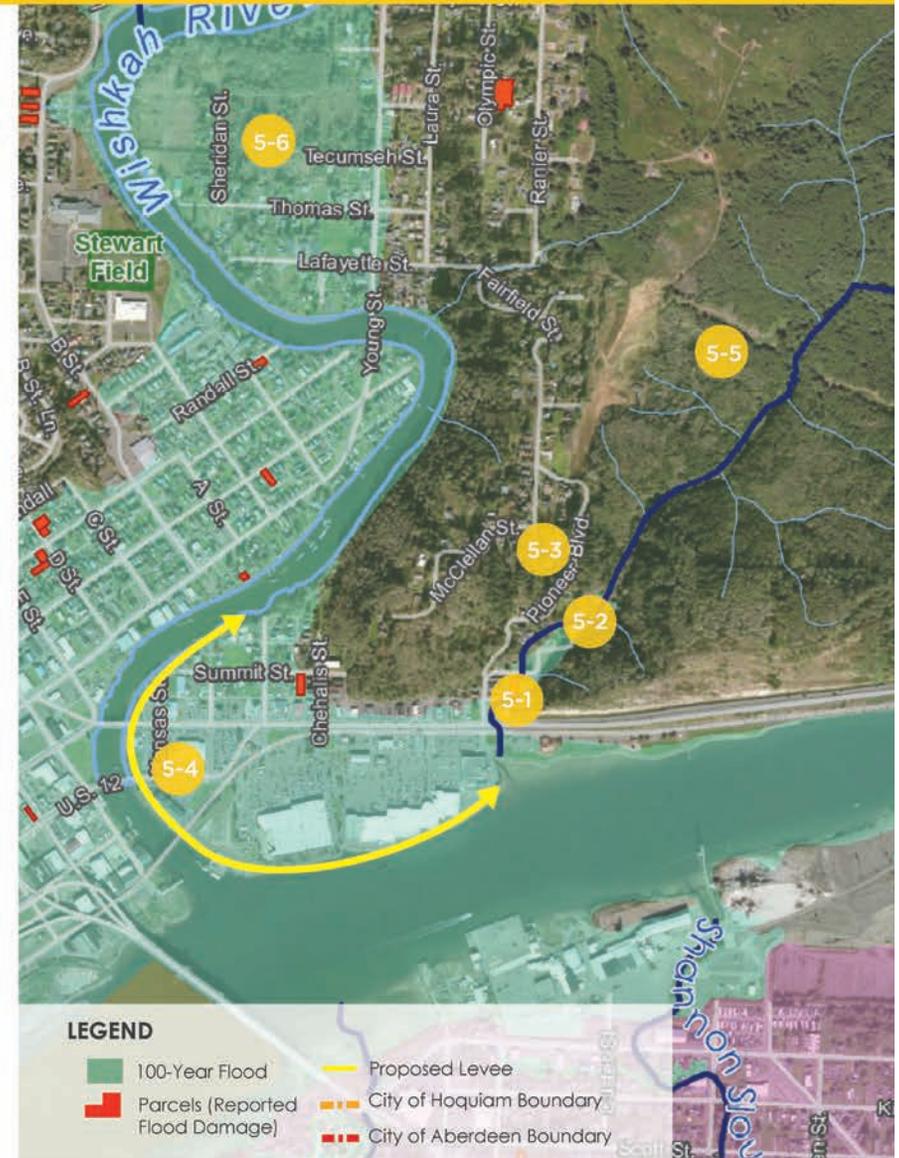
Project Cost

- | | |
|---|--|
| <p>4-1 Targeted Land Protection</p> <p>4-2 Finch Playfield Flood Control Park</p> <p>4-3 Franklin Field Upgrade</p> <p>4-4 Upgrade Outfall Pumps</p> <p>4-5 North Shore Levee</p> <p>4-6 Stewart Creek Culvert Replacement</p> <p>4-7 Stewart Creek Confluence Floodplain Reconnection</p> | <p>LOW</p> <p>MED</p> <p>MED</p> <p>HIGH</p> <p>HIGH</p> <p>LOW</p> <p>MED</p> |
|---|--|



Focus Area 5: East Aberdeen

Project	Cost
5-1 Wilson Creek Fish Passage Study	LOW
5-2 Wilson Creek Floodplain Park / Reconnection	MED
5-3 Pioneer Boulevard Stormwater retrofit design	MED
5-4 Levee Expansion and Certification	HIGH
5-5 Land Protections in Upper Watershed	MED
5-6 North Aberdeen Feasibility Study Evaluate options to reduce flood risk	MED



Focus Area 6: South Aberdeen

Project	Cost
6-1 Shannon Slough Habitat Enhancement	MED
6-2 Alder Creek Feasibility Study	LOW
6-3 Shopping Center LID retrofits	MED

