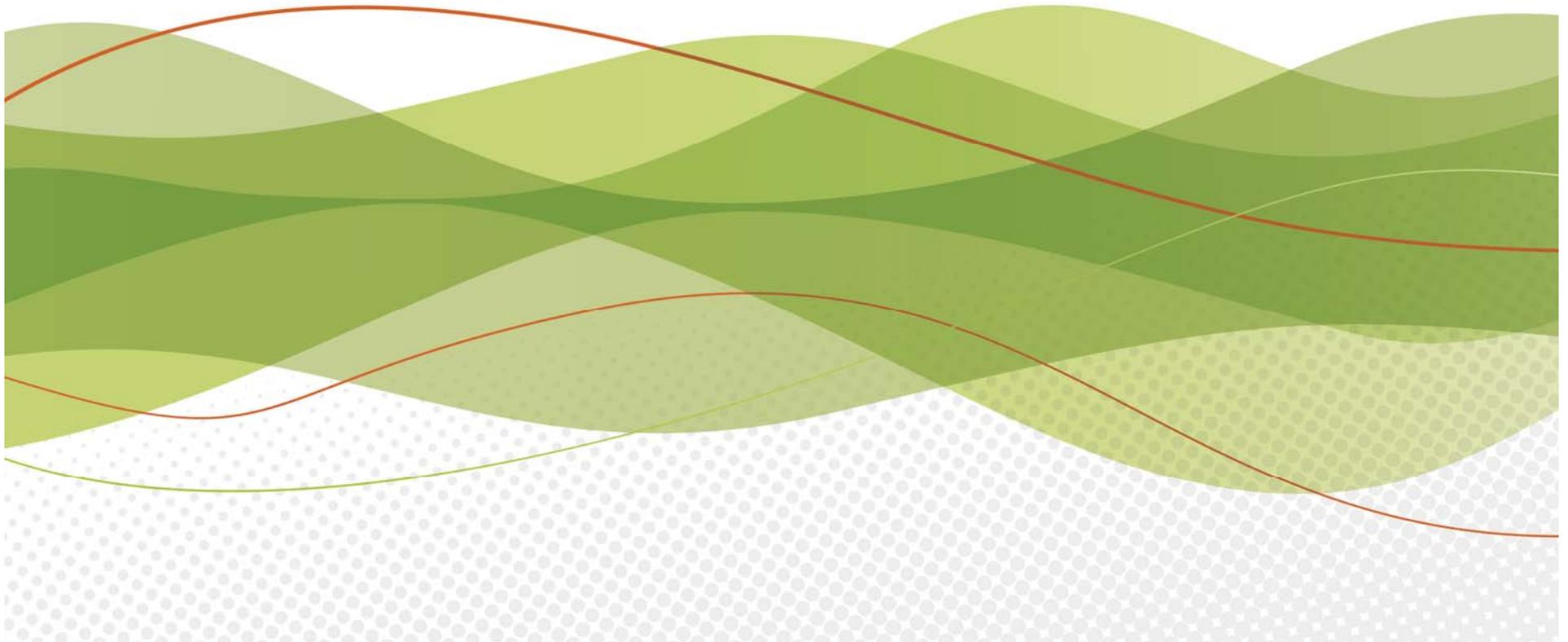




TimberWorks: Resiliency and Restoration Plan Community Meeting April 28, 2016



Agenda

1. Introductions
2. Review Purpose & Goals of Plan
3. Review Assessment of Existing Conditions
 - a. Areas of Recurring Flooding Impacts
 - b. Discussion of Drivers of Flooding
 - c. Discussion of Condition / Constraints in Current Drainage System
4. Discussion of Typologies of Improvements
 - a. Types of Projects
 - b. Applicable Locations
5. Update on Status of Northshore Levee Design
6. Next Steps



TimberWorks Plan

- **Purpose:** Reduce floods, improve fish habitat, improve community spaces, stimulate economy
- **Outcomes:**
 - Comprehensive, broadly supported approach
 - Prioritized set of projects
 - Funding and implementation strategy



TimberWorks Plan

- **Goals:**

- Reduce flood risk in Aberdeen and Hoquiam
- Enhance habitat for fish and wildlife and improve water quality
- Create attractive and active public spaces
- Support economic and community development
- Maximize cost efficiency and build community support through meeting multiple goals
- Foster partnerships and collaboration among public and private parties



TimberWorks Plan

Step 1: Master Plan

Step 2: Feasibility Analysis

Step 3: Design & Permitting

Step 4: Construction /
Implementation

Community Engagement and Partnerships

Pilot Project / Proof of Concept – Expedited to Design and Construction

Elements

- Research - Compiling Existing Information, Review State Of The Science / Case Examples, Targeted Additional Studies
- Identifying Universe Of Opportunities To Address Challenges
- Defining Action Steps To Move Projects Forward

Outcomes

- Articulate Vision, Goals And Objectives
- Set Of Prioritized Opportunity Sites And Projects – 10% Design Level
- Funding Strategy

Elements

- Detailed Engineering Analysis & Cost Estimating
- Detailed Hydraulic and Hydrologic Analysis

Outcomes

- Concept Plans – 30% Level
- Prioritize Opportunity Sites
- Analysis of Construction and Maintenance Funding Options
- Economic Assessment of Costs and Benefits

Elements

- Engineering Design
- Cost Estimating
- Bid Documents
- Land Use And Environmental Permitting

Outcomes

- Final Plans & Bid Documents
- Documents
- Funding Strategy

Elements

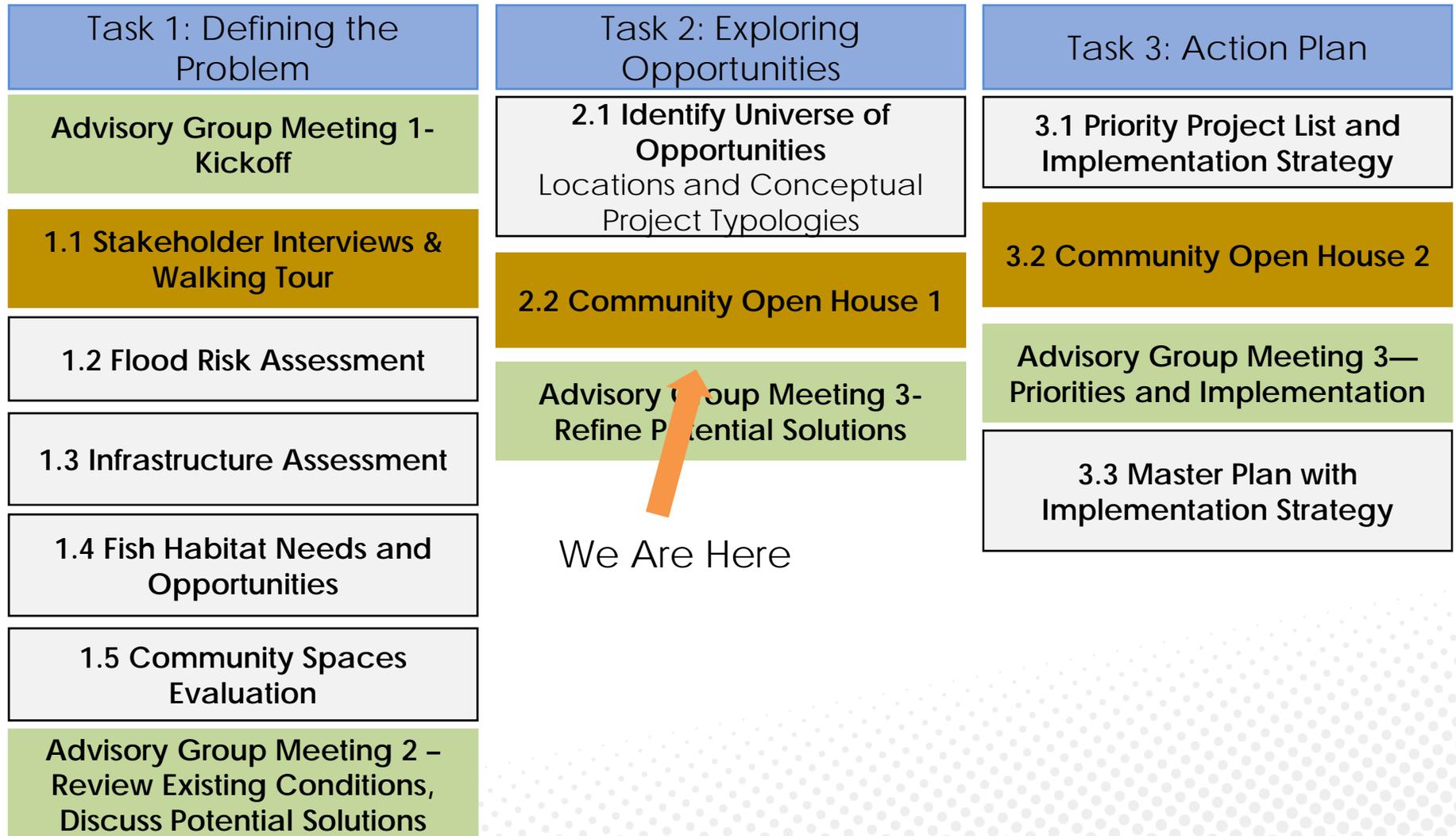
- Construction of Physical Improvements
- Implementation of Programmatic Efforts

Outcomes

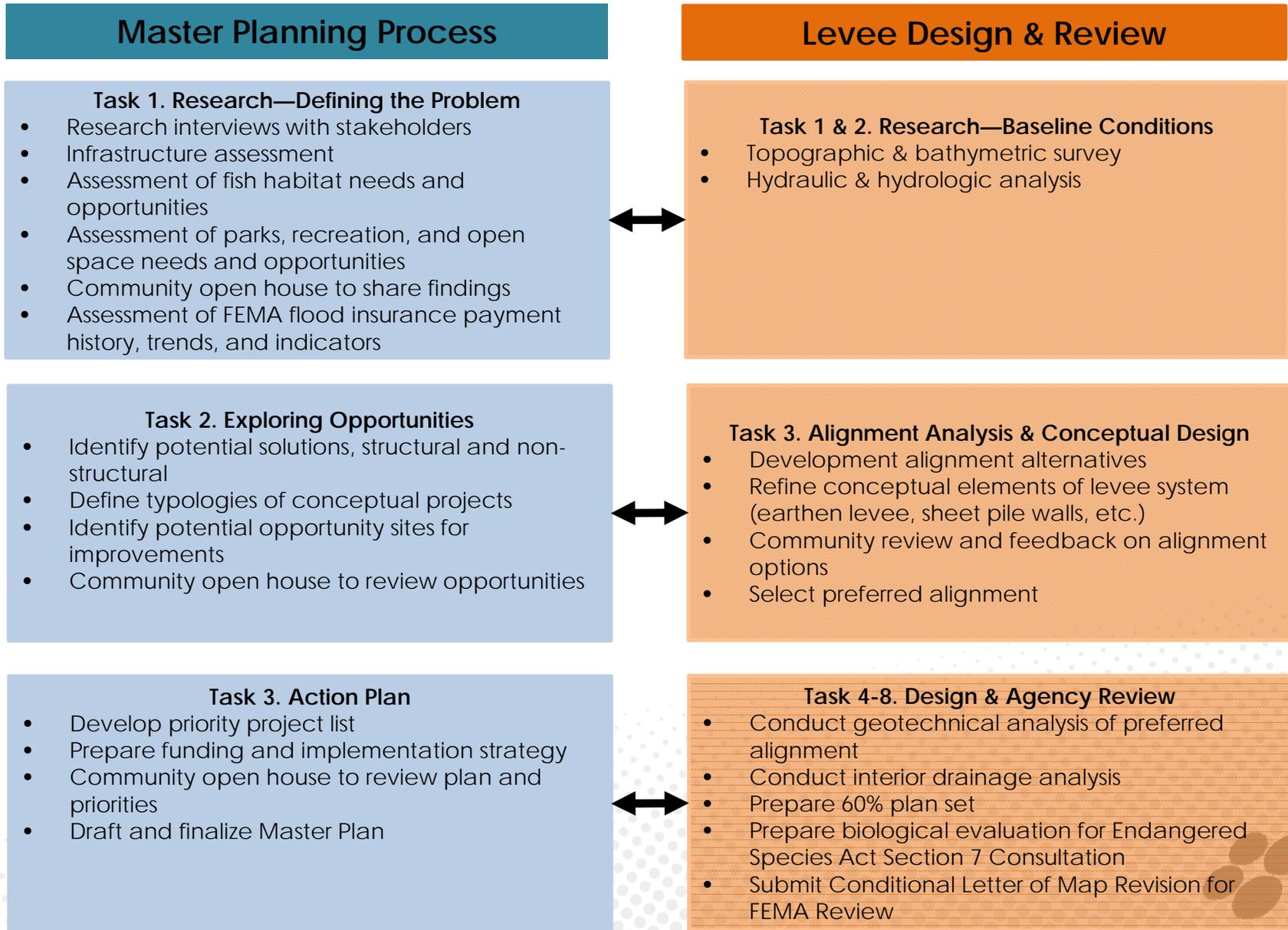
- Constructed



Work Plan



Coordination: Master Plan and Levee Design



FEMA Risk Assessment Statistics

City	Flood Insurance Policies	Total Insurance Coverage	Buildings in Special Flood Hazard Area	Projected Building Loss for 100 Year Flood
Aberdeen	933	\$137 M	32%	\$72 M
Hoquiam	1,153	\$150 M	83%	\$68 M

- Source: FEMA. Draft Risk Report for Grays Harbor County. 2014.



Economic Impacts of Flood Insurance

National Flood Insurance Program

- Aberdeen in program since 1984
- Hoquiam in program since 1979
- 2016 annual premiums: \$2.3 M
- Paid losses since inception: \$5.1 M
- Paid losses prior to Jan 2015 Storm: \$0.9 M
- Total # of Policies
 - 2015: 1,780
 - 2016: 1,632

- Source: FEMA – Aberdeen and Hoquiam Claims Records Request



Stakeholder Interviews

- Key Themes
 - Flooding in Hoquiam and Aberdeen is a combination of storms, tides, and aging conveyance and pump systems
 - Flood rates are a huge concern for residents and businesses, preventing community investment.
 - Biggest flooding issues on Cherry Street, Queets Street, K Street, South Aberdeen
 - Drainages and culverts are old and in declining condition
 - Pump stations in many cases are not adequate to address 100 year storm event
 - Need to plan for rebuilding systems
 - Open space to address flooding is of interest to the community



Walking Tours – March 30

- Key Themes
 - Extent and frequency of flooding impacts and property owner responses
 - Opportunities to use publically owned lands
 - Interest in combining open space, habitat, and flood protection

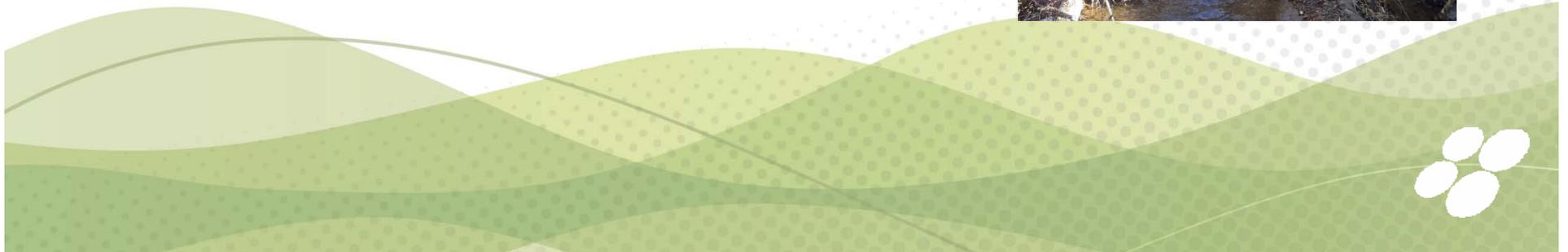


Existing Conditions: Causes of Flooding

- Coastal
- Riverine
- Localized / Urban
- Interactions of Drivers



Typologies of Solutions



Potential Solutions

#	Project Type	Coastal Flooding	Local Flooding
1	Upgrade Pumps	Yes	Yes
2	Levees	Yes	No
3	Land Use Controls in Upper Watersheds – zone change, clearing limits	No	Yes
4	Land Preservation in Upper Watersheds	No	Yes
5	LID Stormwater Retrofits – Upper Watershed – <i>rain gardens and swales along streets</i>	No	Yes
6	LID Stormwater Retrofits – Lowlands – rain gardens and tree planting	No	Yes
7	Flood Storage Parks	No	yes
8	Floodplain Reconnection	No	Yes
9	Property Buyout	Yes	Yes
10	Sediment Trap Basins	No	Yes
11	Drainage Pipe Capacity Increases	No	Yes

Potential Solutions

1. Upgrade Pumps

- Increase capacity to drain pipes
- Reduce impacts to fish
- Requirement of FEMA approval of levee



Example fish screen



Typical pump station



Potential Solutions

2. Levee System

- Barrier to coastal flooding
- Potential to remove areas from FEMA flood zone
- Combination of floodwall, earthen levee, raised streets, and tie ins to high elevation areas



Flood wall
Mt. Vernon, WA



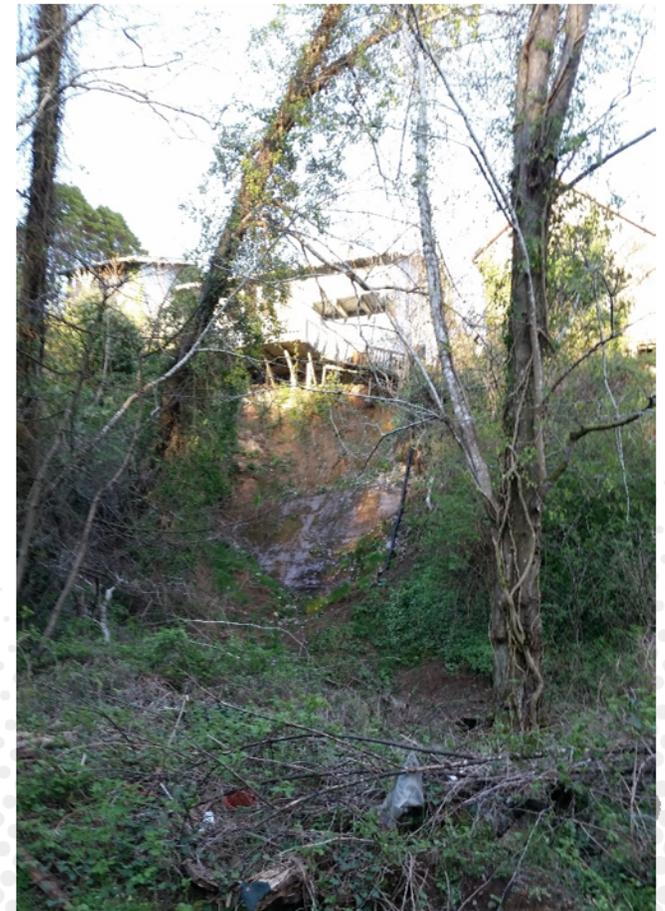
Earthen levee with trail
Washougal, WA



Potential Solutions

3&4. Land Protection

- Zoning and Regulatory Controls
- Conservation Easements



Potential Solutions

5&6. Low Impact Stormwater Retrofits

- Limited infiltration capacity
- Dispersed potential to retain and slow runoff



Green street
Portland, OR



Rain barrel example



Potential Solutions

7. Flood Storage Parks

- Limited by depth to groundwater
- Consider creating storage tanks
- Opportunities in publically owned lands



Aberdeen



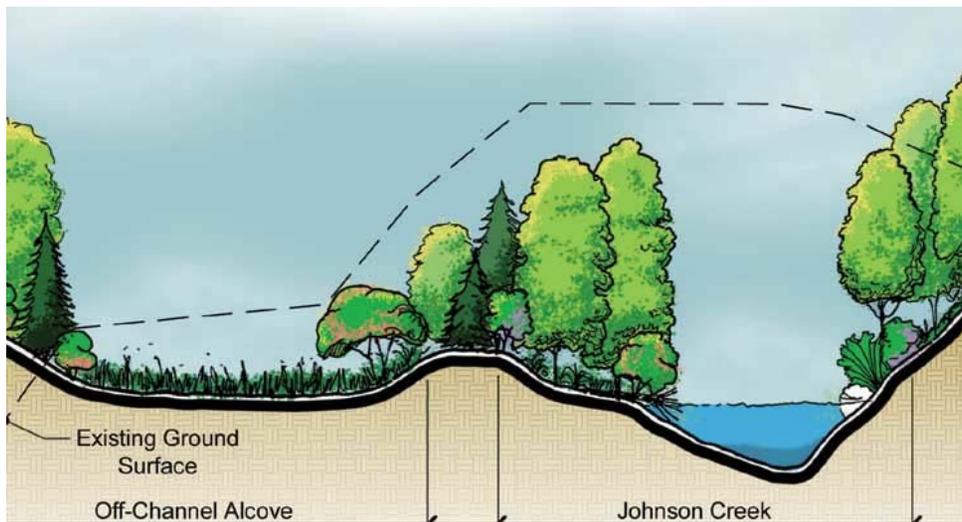
Madison Valley
Seattle



Potential Solutions

8. Floodplain Reconnection

- Increase flood storage capacity
- Increase habitat diversity
- Fry Creek, Wilson Creek



Johnson Creek,
Oregon



North Shore Levee: Status Update



- Project to obtain 60% design and FEMA Conditional Letter of Map Revision (CLOMR)
- Topographic and bathymetric survey under way
- Hydraulic and hydrologic modeling under way



Next Steps

- Community Open House
- Preliminary Evaluation of Solution Types
 - Flood benefit
 - Habitat benefit
 - Community benefit
 - Order of magnitude costs
- Recommended project list

- Advisory Group Meeting #3
 - Review Recommended Projects



Thank You

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