Snohomish Basin Floodplain Acquisition Strategy
Outline

• Purpose
• Goal
• Extent
• Background
• Overview of Draft Strategy
• Summary of Metrics and Scoring Criteria
• Premise behind each Metric and Preliminary Scoring
• Next Steps
Purpose

• Guidance for implementation of Salmon Conservation Plan
• Prioritize parcels for conservation/restoration of floodplain/instream processes
• Potential to obtain proactive acquisition dollars
• Capitalize on opportunistic property availability
Goals

• Establish corridors of protected floodplains
• Accelerate restoration project implementation
• Flood storage/conveyance
• Human safety
• Decrease flood damage claims
Extent Considerations

• Comparable Valley Types

• Relatively Contiguous

• Most Pressing Need

• Ending Near Upper Extent of Non-Protected Lands
Valley is aggrading since glacial retreat, river forms natural levees, wetlands common at valley margins.

River is incising since glacial retreat, moderate to wide floodplain, terraces flank valley floor.

Channel confined by bedrock, very narrow or no floodplain.

Moderate to narrow floodplains, may have terraces present.
King County Farmland Preservation

- Farmland Preservation Properties
- Agricultural Production Districts
- Incorporated Areas
- King County Boundary
- Major Roads

Snoqualmie River APD
Background

• Process based restoration is most effective (Beechie et al. 2010)
  • Channel migration, floodplain forest development, etc.
  • Requires large river adjacent areas and long time frames

• Connectivity is vital
  • Armoring/dike removal, etc.

• Long term opportunistic approach

• Only evaluates properties in a funding limited situation
  • All floodplain properties are high value
  • Prioritizes discrete units to be protected/restored incrementally
The Acquisition Strategy of the Stillaguamish Chinook Recovery Plan

• Draws Heavily from the EPA-funded Stillaguamish Peak Flows study

• Produced a GIS tool to prioritize floodplain areas

• Divides the active floodplain into “floodplain units” (FPUs)

• FPUs were ranked for conservation or restoration acquisitions

• Protected “corridor” approach
The Acquisition Strategy of the Stillaguamish Chinook Recovery Plan

• Adopted by SWC 2015
• Closed on 312 Acres
• 7 Properties
• 400 Acres Pending
• Strategic Vision for Basin/Funders
• Visually Depicts Need/Scope
• Creates Acquisition Opportunities
  • (informs sellers)
Floodplain Units

• Discrete portion of the floodplain that are expected to be affected as a “unit” if channel migration is allowed to resume

• ≤ 5’ above 100 year floodplain elevation

• Do not span the adjacent stream BFW

• Constrained by major transportation corridors (RR grades, Highways, etc.)

• Larger than 5 acres and substantially larger than the adjacent BFW

• Split where hydrologically distinct
Conservation Priority

Most Desirable Candidate

Least Desirable Candidate
• 205 FPUs
• 5-1,951 Acres
• 18,840 Total Acres (~30 Square Miles)
<table>
<thead>
<tr>
<th>Category</th>
<th>FPU Metric</th>
<th>Scoring Criteria</th>
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<tbody>
<tr>
<td>Importance</td>
<td>Relative Elevation</td>
<td>FPU Elevation Relative to the 100-Year Flood Elevation</td>
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<td></td>
<td>Flow Importance</td>
<td>FPU Water Flow Importance (Delivery, Discharge, Recharge, &amp; Surface Storage)</td>
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<td></td>
<td>Sub-Basin Strategy Group</td>
<td>FPU in Mainstem/Headwaters &amp; Primary/Secondary</td>
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<td></td>
<td>Habitat Potential</td>
<td>Length of Potential Floodplain Channels and River Frontage per FPU</td>
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<tr>
<td>Feasibility</td>
<td>Land Use Type</td>
<td>FPU in Land Uses More or Less Compatible with Restoration/Conservation</td>
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<tr>
<td></td>
<td>Number of Landowners</td>
<td>Number of Landowners in the FPU</td>
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<td></td>
<td>Landowner Density</td>
<td>Density of Landowners in the FPU</td>
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<tr>
<td></td>
<td>Percent Protected</td>
<td>Percent of the FPU Currently Protected</td>
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<tr>
<td>Degradation</td>
<td>Armoring</td>
<td>Percentage of FPU River Frontage Armored</td>
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<td></td>
<td>Channel Constriction</td>
<td>Actual BFW Compared to Expected BFW Adjacent to the FPU</td>
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<td></td>
<td>Sinuosity</td>
<td>River Centerline Distance Compared to Straight Line (Euclidean) Distance Adjacent to the FPU</td>
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<td>Water &amp; Vegetation Cover</td>
<td>Percent of the FPU with Course Vegetation and Water Cover</td>
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<td></td>
<td>Flow Degradation</td>
<td>FPU Water Flow Degradation (Delivery, Discharge, Recharge, &amp; Surface Storage)</td>
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<tr>
<td>Parcel Metric</td>
<td>Scoring Criteria</td>
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<td>------------------------------------------------------</td>
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<tr>
<td>Adjacency</td>
<td>Number of Adjacent Protected Parcels</td>
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Final Parcel Acquisition Scoring

• 3 Final Scores For Every FPU and Parcel
  • Restoration Score
  • Conservation Score
  • Total Score
Final Parcel Acquisition Scoring

- **Restoration Score** = Importance + Feasibility + Degradation + Adjacency

- **Conservation Score** = Importance + Feasibility + Inverse Degradation + Adjacency

- **Total Score** = Importance + Feasibility + Adjacency
Importance Metrics

• Relative Elevation
• Flow Importance
• Sub-Basin Strategy Group
• Habitat Potential
Floodplain Elevation

• Premise: Floodplain Units having a lower average depth relative to the FEMA 100-year flood elevation are more desirable targets for restoration/conservation.
Flow Importance

• Premise: Floodplain Units of more importance to water flow quantity and timing are more desirable targets for restoration/conservation.
Puget Sound Watershed Characterization Project

• Importance and Degradation of Water Flow:
  • Delivery
  • Discharge
  • Recharge
  • Surface Storage
SNOHOMISH BASIN PROTECTION PLAN
Flow Importance

- **Delivery**
  - Precipitation
  - Snow & rain on snow

- **Movement**
  - Surface Storage
  - Depressional wetlands & lakes
  - Unconfined & moderately confined floodplains
  - Recharge, Subsurface Flow, Storage & Discharge
  - Permeability
  - Slope wetlands & higher permeable floodplains

- **Loss**
  - Not Modeled
Sub Basin Strategy Group

• Premise: Primary strategy groups are more desirable targets for restoration/conservation than secondary groups.
Habitat Potential

• Premise: Floodplain Units with a higher length of river frontage and potential floodplain channels are more desirable targets for restoration/conservation.
Feasibility Metrics

• Land Use Type
• Number of Landowners
• Landowner Density
• Percent Protected
Land Use Types

• Premise: Floodplain Units having a larger percentage of area in land uses more compatible with restoration/conservation (i.e. forestry, open space, agricultural, etc.) are more desirable targets for restoration/conservation.
Land Use Types

- 100 = Water Area
- 100 = Undeveloped/Vacant
- 100 = Mining
- 90 = Forestry
- 90 = Park/Open Space
- 80 = Agriculture (current tax use)
- 70 = Recreation
- 50 = Agriculture (other than current use)
- 50 = Residential
- 30 = Social or Governmental Services
- 20 = Infrastructure (transportation/utility)
- 10 = Commercial
- 10 = Industrial
Number of Landowners

• Premise: Floodplain Units held by fewer landowners are more desirable targets for conservation/restoration.
• Premise: Floodplain Units with a lower density of landowners are more desirable targets for conservation/restoration.
Percent Protected

• Premise: Floodplain Units with a higher percentage of protected lands are more desirable targets for restoration/conservation.
Protected Parcel Definition

Under a conservation easement, managed under State, Federal, or industrial forest rules, or otherwise owned by a governmental entity AND managed for natural resources protection and long term natural process function.
Degradation Metrics

• Armoring
• Channel Constriction
• Sinuosity
• Water and Vegetation Cover
• Flow Degradation
Armoring

• Premise: Floodplain Units with a greater proportion of armoring are more desirable targets for restoration. Floodplain units with a lesser proportion of armoring are more desirable targets for conservation.
Channel Constriction

• Premise: Floodplain Units along more constricted river channels are more desirable targets for restoration. Floodplain units along less constricted river channels are more desirable targets for conservation.
Sinuosity

• Premise: Floodplain Units along less sinuous river channels are more desirable targets for restoration. Floodplain units along more sinuous river channels are more desirable targets for conservation.
Water and Vegetation Cover

• Premise: Floodplain Units with lower water and course vegetation coverage are more desirable targets for restoration. Floodplain units with higher water and course vegetation coverage are more desirable targets for conservation.
Flow Degradation

• Premise: Floodplain Units with more degraded water flow quantity and timing are more desirable targets for restoration. Floodplain Units with less degraded water flow quantity and timing are more desirable targets for conservation.
Puget Sound Watershed Characterization Project
Flow Degradation

Delivery
- Timing
  - Impervious cover
  - Forest loss
  - Dams

Movement
- Overland Flow & Surface Storage
  - Impacts to depressional wetlands
- Impacts to floodplains
- Recharge, Subsurface Flow, Storage & Discharge
  - Development intensity
  - Road density
  - Well density
  - Impacts to floodplains & slope wetlands

Loss
- Evapotranspiration
  - Impervious cover
Adjacency (Parcel Scale)

• Premise: Parcels adjacent to other protected parcels are more desirable targets for conservation/restoration.
Next Steps

• Finish Metrics
• Normalize and Weight Metrics
  • Criterion Decision Plus (CDP)
  • Ecosystem Management Decision Support System (EMDS)
• Generate Final Scoring (Restoration, Conservation, Total)
• Discuss Potential Adoption by the Snohomish Basin Salmon Recovery Forum
• Discuss Potential Inclusion as an Update to the Conservation Plan