USING B-IBI TO IDENTIFY PUGET SOUND WATERSHEDS FOR RESTORATION AND PROTECTION

Chris Gregersen, Jo Wilhelm (Project Manager), Debra Bouchard, Chris Knutson, Kate Macneale

Funded by EPA federal pass through funds via WA Dept. of Ecology as part of the PSP Action Agenda: Ecosystem Restoration and Protection Project

Science Seminar November 5, 2014
B-IBI: PSP Vital Sign Indicator
PSP Ecosystem Recovery Targets

Freshwater Quality B-IBI Targets by 2020:

- **PROTECTION** - All stream drainage areas retain “excellent”
- **RESTORATION** - 30 basins improve from “fair” to “good”
On the ground progress towards targets: none

Currently no funding for restoration & protection implementation or effectiveness monitoring

Funding for King Co. to prioritize basins & develop strategies (this project)
Limits and Opportunities

- EPA Restoration framework vs. opportunistic, single site actions
- Thoughtful, practical approach
  - using only the data we have available
  - identify where we should focus, what other data we would want
- Not fish focused, though restoration activities that benefit fish would likely benefit bugs
- May be able to leverage additional support for restoration if there are fish recovery goals for the stream or watershed
FALL 2013  2014  JUNE 2015

PRESERVE

ID “Excellent” Sites
Download B-IBI Data

ID “Fair” Sites
Landscape Analysis

RESTORE

Preservation Strategies
Cost Estimates

Decision Framework
Prioritize ~ 30 sites

Restoration Strategies

Implement
Monitor

Stakeholder Feedback

We are here
Download B-IBI Data:
www.pugetsoundstreambenthos.org
“Excellent” Sites ($\geq 42$) = Protection

“Excellent” scores

- $\geq 46$
- $\geq 42$ and $< 46$

121 sites scored “excellent” at least once

35 sites had a median “excellent” score

33 sites averaged “excellent”
“Fair” Sites (28-36) = Restoration

- “Fair” average
- “Fair” at least once

648 sites scored “fair” at least once

439 sites with median “fair” scores
Restoration Decision Framework

Part 1

Filtering
Applied first. Criteria used to reduce number of sites considered.

- < Fair: Omit
- Median “Fair”: 439 sites
- > Fair: Omit

Part 2

Ranking
Applied after filtering. Uses a cumulative ranking to assess the criteria and assign a score to each site so that the sites can be prioritized.
Landscape Analysis

- 439 Basins

- Basin delineation
- Scale
  - Watershed
  - Local (1 km)
  - Buffer (90-m)
- Metrics
  - Landcover
  - Geology
  - Site characteristics
Filtering: Ecoregion

Western Washington Ecoregions
- Cascades
- Coastal Range
- North Cascades
- Puget Lowland
- Puget Sound Basin
Filtering: Sampling History

N > 2

362 → 197

Since 2007?

No → N > 4

Yes

N > 4

No

Yes

174
Filtering: Watershed Area

- <200 Acres: Too Small
- 200-3000 Acres: Just Right
- >3000 Acres: Too Big

174 → 81
Filtering: PSWC

PS Watershed Characterization

PSWC Metrics
- Hydrography
- Landcover
- Precipitation
- Soils
- Geology
- Roads
- Wetlands
- Slope

81

→ 59
Ranking: Biotic Potential

Observed Biological Potential (90th quantile regression line)
Ranking: Biotic Potential
Recap:

CRITERIA

Median B-IBI Score

Ecoregion

Sampling History

Watershed Area

Puget Sound Watershed Characterization

PRIORITIZE

All Sites 1053

"Fair" 439

> "Fair" 112

< "Fair" 502

Puget Lowland 362

North Cascades 26

Cascades 21

Coastal Range 30

N<5, <2007 23

N>2, >2007 164

N>4 10

N<3 165

200-3000 Acres 81

<200 Acres 17

Protect/Restore 59

Development 22

Rank Using Biological Potential
## Top 30 sites

<table>
<thead>
<tr>
<th>WRIA #</th>
<th>WRIA Name</th>
<th>Sites in Top 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Stillaguamish</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Snohomish</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>Duwamish-Green</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>Puyallup-White</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>Kitsap</td>
<td>12</td>
</tr>
<tr>
<td>18</td>
<td>Elwha-Dungeness</td>
<td>1</td>
</tr>
</tbody>
</table>
Other Criteria Considered

- Threatened/endangered fish presence
- Land ownership
- Urban growth area
- Habitat connectivity
- Hydrology
- Natural buffer
Next Steps: Restoration

What is Feasible? Effective?

Your Feedback!

- Habitat improvements
- Riparian plantings
- SW retrofits
- Agriculture BMPs
- Education/outreach
- Seeding inverts…
Next Steps: **Preservation**

Strategies to preserve Excellent Sites

- Land Purchase
- Conservation easements
- Development rights
Restoration Priorities
Strategies for Preserving and Restoring Small Puget Sound Drainages

Background
In fall 2013 the King County Water and Land Resources Division finalized a two year interagency agreement with the Washington State Department of Ecology funded by Environmental Protection Agency pass through funds as part of the Puget Sound Action Agenda Ecosystem and Protection Project. The purpose of this project is to develop strategies and cost estimates for preserving all Puget Sound drainages with “excellent” benthic index of biotic integrity (B-IBI) scores and ecosystem recovery targets. This project is intended to prioritize managing urban runoff at the basin and watershed scales.

This project relies on existing data and does not include data from the Puget Sound Stream Benthos website and site locations cannot be identified. A geospatial analysis will be done to delineate catchments including land cover and geology in addition to site characterizations.

King County staff working with the Puget Sound Watershed with “fair” scores and prioritize 30 sites for the development of stakeholders. Once the 30 sites are prioritized, planning activities on a general cost per unit of activity - such as the individual restoration projects will not be developed.

King County will also develop strategies for preserving basin purchase, conservation easement purchase, and transfers of the

Documents and Presentations

Deliverable for Task 2: Geospatial Analysis, Chris Gregersen, Jo Wilhelm, Chris Knutson

Quality Assurance Project Plan (QAPP), Jo Wilhelm, Chris Gregersen

Signed Interagency Agreement (C1300210), WA Dept of Ecology, King County WLRD

Puget Sound B-IBI Advisory Group Meeting [hide]
February 2014, Seattle, WA

Prioritizing Stream Preservation & Restoration Based on B-IBI, Jo Wilhelm

PSP Science-Policy Workshop [hide]
December 2013, Seattle, WA

Implementation Strategies: Freshwater Insect Recovery Target, Jo Wilhelm

NW Biological Assessment Workgroup Meeting [hide]
November 2013, Astoria, OR

Using B-IBI to Set Restoration Targets for Puget Sound Watersheds, Jo Wilhelm, Leska Fore
Acknowledgements

**King County:**
Gino Lucchetti, Kate O’Laughlin, Jim Simmonds, Kerry Thrasher

**GIS:**
Peter Leinenbach (EPA), Ken Rauscher (King Co.)

**PS Watershed Characterization:**
Ecology: Susan Grigsby, Colin Hume, Stephen Stanley, Kelly Slattery
WDFW: George Wilhere

**Ecology Project Administration:**
Tom Gries, Kim Harper, Doug Howie, Kirsten Weinmeister

**Stakeholder Workgroup**