Using B-IBI to Identify Puget Sound Watersheds for Restoration and Protection

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

Jo Wilhelm (Project Manager), Debra Bouchard, Chris Gregersen, 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
B-IBI: PSP Vital Sign Indicator
Ecosystem Recovery Targets

Freshwater Quality B-IIBI Targets by 2020:

- **PROTECTION** - All stream drainage areas retain “excellent”
- **RESTORATION** - 30 basins improve from “fair” to “good”
State of the Sound

- On the ground progress towards targets: none
- Funding for King Co. to prioritize basins & develop strategies (this project)
- Currently no funding for restoration & protection implementation or effectiveness monitoring
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
454 sites with median “fair” scores
428 sites averaged “fair”
Restoration Decision Framework

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

- < Fair: Omit
- Median “Fair”: 454 sites
- > Fair: Omit

**Ranking/Scoring**
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.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>SITE 1</th>
<th>SITE 2</th>
<th>SITE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watershed Context</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Biotic Potential</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>OVERALL SCORE</strong></td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
Landscape Analysis

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

QAQC → 432
Initial Filters: Ecoregion

Puget Lowland Ecoregion
Initial Filters: Sampling History

365 → 180

N>2

180 → 180

Since 2007?

N>4

Yes

No

365 → 180

N>4

Yes

No

156
Initial Filters: Watershed Area

- <200 Acres: Too Small
- 200-3000 Acres: Just Right
- >3000 Acres: Too Big
### Initial Filters: PSWC

<table>
<thead>
<tr>
<th>Importance</th>
<th>Degradation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low Protection</td>
</tr>
<tr>
<td>Low</td>
<td>High Protection</td>
</tr>
<tr>
<td>High</td>
<td>Low Protection</td>
</tr>
<tr>
<td>High</td>
<td>High Protection</td>
</tr>
</tbody>
</table>

PS Watershed Characterization

[Map Image]
Watershed Context

Worst = 0
- Urban > 30%
- Buffer < 50% natural

Moderate = 1
- Urban > 30%
- Buffer > 50% natural

Good = 2
- Urban < 30%
- Buffer < 50% natural

Best = 2
- Urban < 30%
- Buffer > 50% natural
Biotic Potential – all scores

% WS Urbanization

All

Selected
Biotic Potential – all scores

% WS Urbanization

B-IBI

Selected
Next Steps

- **FALL 2013**
  - Download B-IBI Data
  - ID “Excellent” Sites

- **2014**
  - Landcape Analysis
  - Decision Framework
  - Prioritize ~ 30 sites
  - Preservation Strategies

- **JUNE 2015**
  - Restoration Strategies
  - Cost Estimates

**Preserve**

**Restore**

We are here

Stakeholder Feedback
Next Steps: Restoration

What is Feasible? Effective?

- Habitat improvements
- Riparian plantings
- SW retrofits
- Agriculture BMPs
- Education/outreach
- Legislation
- Incentives
- Seeding inverts…
Project Web Page:

**Puget Sound Stream Benthos**

**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 Protection Project. The purpose of this project is to develop strategies and cost estimates for preserving and restoring all Puget Sound drainages with “excellent” benthic index of biotic integrity (B-IBI) scores and to set ecosystem recovery targets. This project is intended to assist in managing urban runoff at the basin and watershed scale.

The project relies on existing data and does not include new data from the Puget Sound Stream Benthos website and site visits which will be identified. A geospatial analysis will be done to delineate small drainages including land cover and geology in addition to site characteristics.

King County staff working with the Puget Sound Watershed with “fair” scores and prioritize 30 sites for the development of restoration strategies. Once the 30 sites are prioritized, planning and restoration activities on a general cost per unit of activity - such as a stream mile - will be necessary for the individual restoration projects will be developed.

King County will also develop strategies for preserving baseline data, purchase, conservation easement purchase, and transfer of ownership to an appropriate agency.

**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

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WDFW: George Wilhere

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

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