May 2014

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

Jo Opdyke Wilhelm  
*King County (Wash.). Department of Natural Resources and Parks*, jo.wilhelm@kingcounty.gov

Chris Knutson  
*King County (Wash.). Department of Natural Resources and Parks*

Chris Gregersen  
*King County (Wash.). Department of Natural Resources and Parks*

Debra Bouchard  
*King County (Wash.). Department of Natural Resources and Parks*

Kate MacNeale  
*King County (Wash.). Department of Natural Resources and Parks*

Follow this and additional works at: [https://cedar.wwu.edu/ssec](https://cedar.wwu.edu/ssec)  
Part of the [Terrestrial and Aquatic Ecology Commons](https://cedar.wwu.edu/ssec)

Opdyke Wilhelm, Jo; Knutson, Chris; Gregersen, Chris; Bouchard, Debra; and MacNeale, Kate, "Using B-IBI to Identify Puget Sound Watersheds for Restoration and Protection" (2014). *Salish Sea Ecosystem Conference*. 126.  

This Event is brought to you for free and open access by the Conferences and Events at Western CEDAR. It has been accepted for inclusion in Salish Sea Ecosystem Conference by an authorized administrator of Western CEDAR. For more information, please contact westerncedar@wwu.edu.
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
Freshwater Quality B-IBI 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
FALL 2013

2014

JUNE 2015

PRESERVE

Download B-IBI Data

ID “Excellent” Sites

RESTORE

ID “Fair” Sites

Landscape Analysis

Preservation Strategies

Prioritize ~ 30 sites

Decision Framework

Restoration Strategies

Cost Estimates

We are here

Implement

Monitor

Stakeholder Feedback
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”
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>OVERALL SCORE</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 

454 → 432
Initial Filters: Ecoregion

Puget Lowland Ecoregion
Initial Filters: Sampling History

365 → N>2

180 → Since 2007?

180 → N>4

156
Initial Filters: Watershed Area

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

PS Watershed Characterization

<table>
<thead>
<tr>
<th>IMPORTANCE</th>
<th>DEGRADATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Highest Protection</td>
</tr>
<tr>
<td>High</td>
<td>High Protection</td>
</tr>
<tr>
<td>Low</td>
<td>Low Protection</td>
</tr>
<tr>
<td>Lowest</td>
<td>Lowest Protection</td>
</tr>
</tbody>
</table>
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 vs. B-IBI

All
Selected
Biotic Potential – all scores

\[ B-IBI \] vs. \% WS Urbanization

Selected
Preserve

ID “Excellent” Sites

Download B-IBI Data

Landscape Analysis

ID “Fair” Sites

Prioritize ~ 30 sites

Preservation Strategies

Decision Framework

Restoration Strategies

Cost Estimates

Next Steps

Stakeholder Feedback

We are here
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 and Protection Project. The purpose of this project is to develop strategies and cost estimates for preserving all Puget Sound drainages with an "excellent" benthic index of biotic integrity (B-IBI) scores and ecosystem recovery targets. This project is intended to address managing urban runoff at the basin and watershed scale.

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

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 those and individual restoration projects will not be developed.

King County will also develop strategies for preserving bank purchase, conservation easement purchase, and transfer

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
Suggestions/Success Stories

Jo.Wilhelm@kingcounty.gov

www.pugetsoundstreambenthos.org