

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

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



King County

Department of
Natural Resources and Parks
Water and Land Resources Division

PNW Chapter SFS, Bellingham WA

Nov. 6, 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”

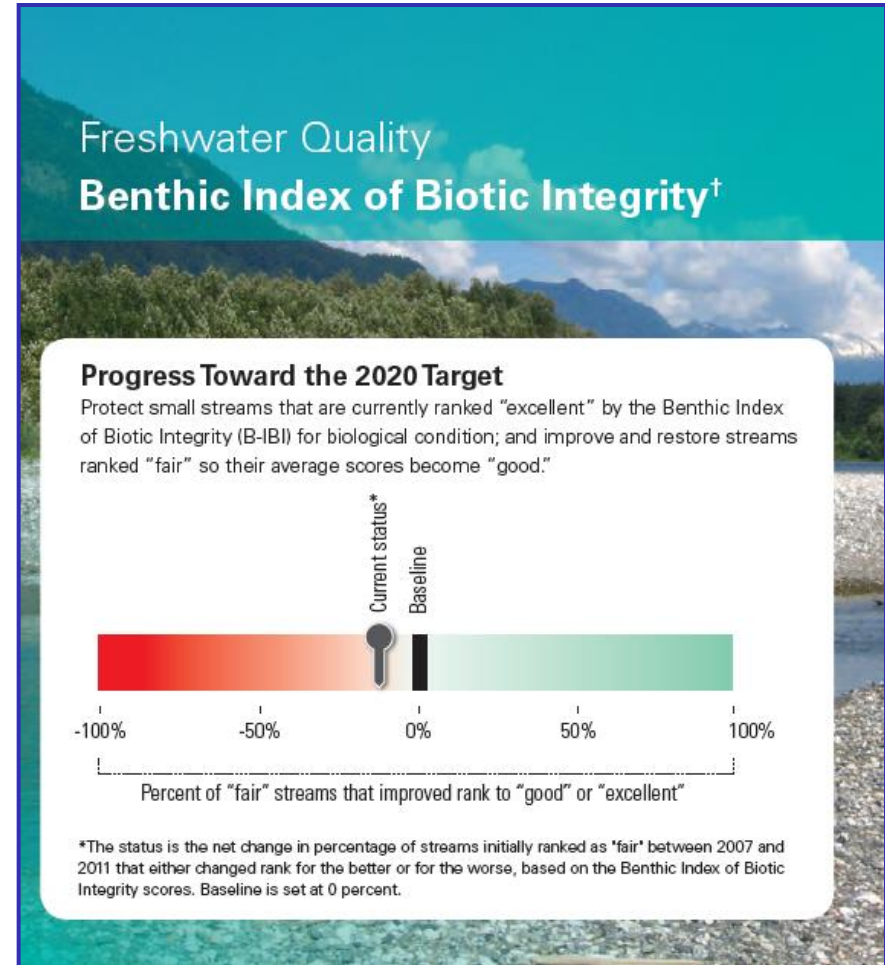


PSP Report Card

 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)



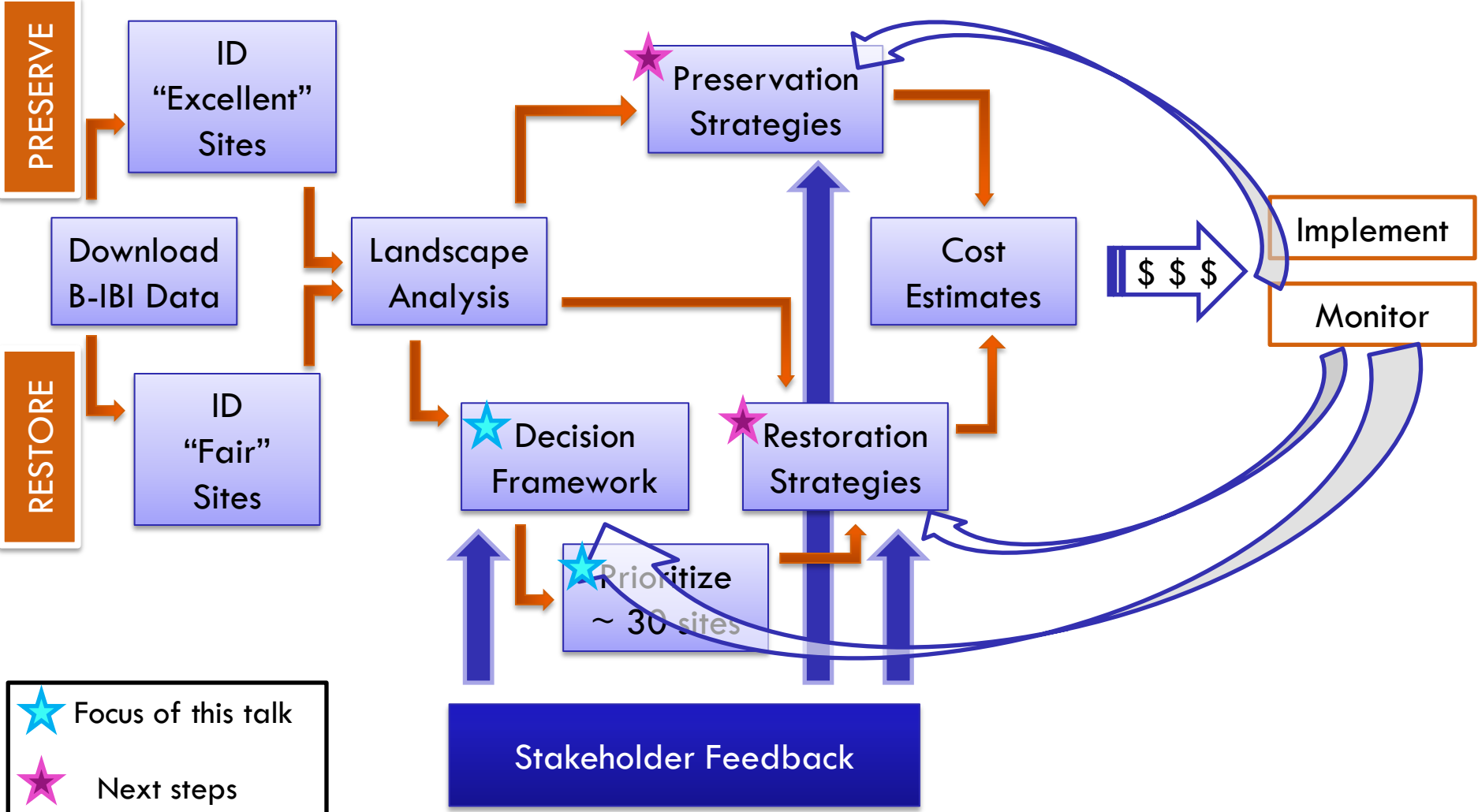
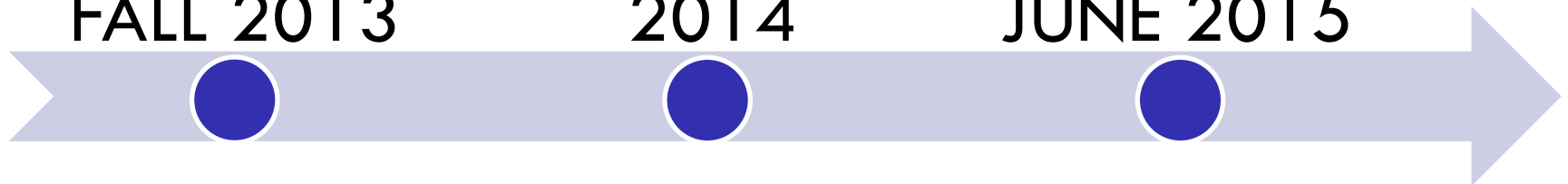
Limits and Opportunities

- Framework vs. opportunistic, single site action
- Thoughtful, practical approach
 - Widely available data
 - Simple, transparent, updatable
- Not fish focused
 - Restoration benefiting fish likely to benefit bugs
 - Potential to leverage additional support if there are fish recovery goals for prioritized watersheds

FALL 2013

2014

JUNE 2015



★ Focus of this talk
★ Next steps

Download B-IBI Data:

www.pugetsoundstreambenthos.org

Puget Sound Stream Benthos

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Analysis: [Benthic Index of Biotic Integrity](#) Show Criteria

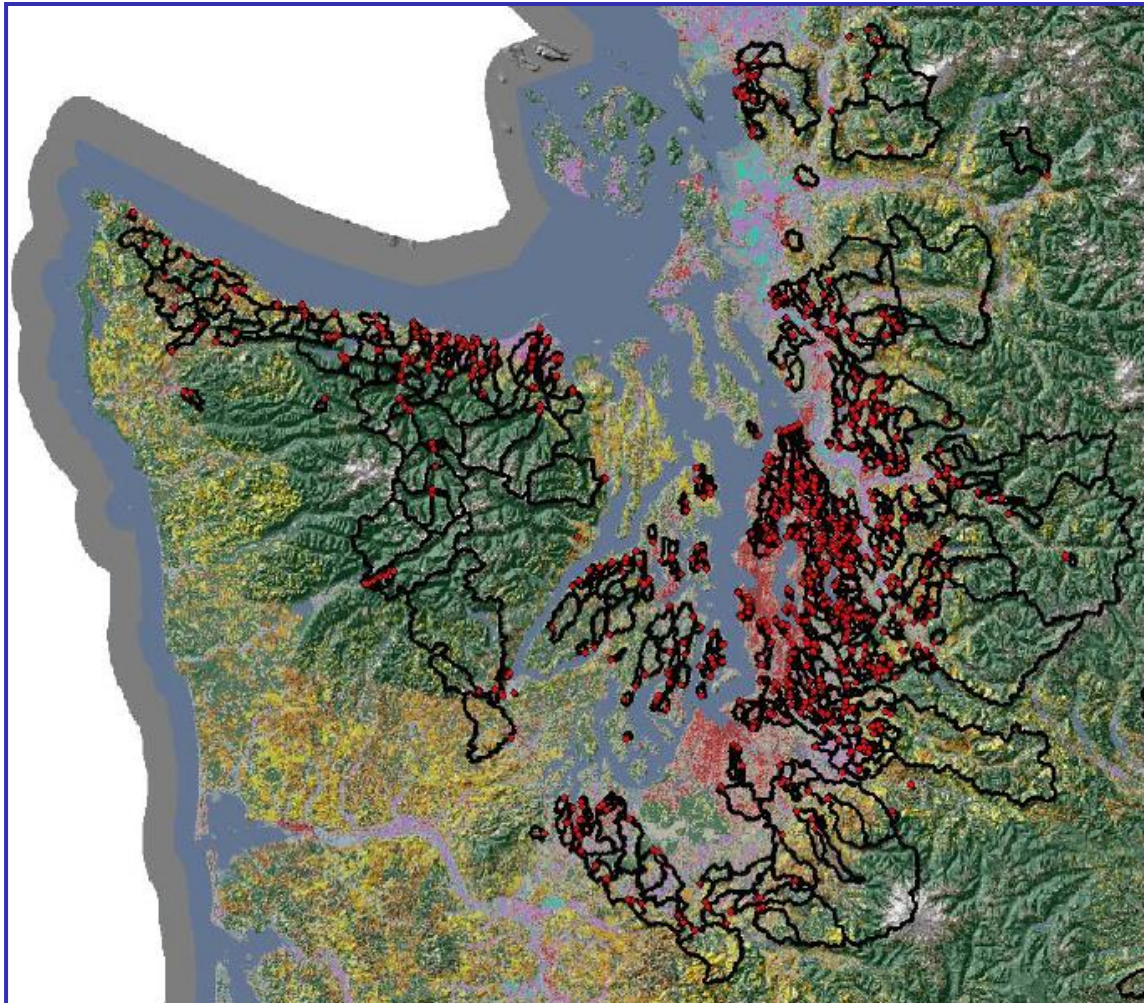
Clear & Use Default Options Show More Options

Area: All Puget Sound Streams | Project: All Projects | Location or Keyword:

Open in new tab | Plot on Map | Tabulate | Tabulate Trend | Chart Trend | Show Samples | Download...

The map displays the Puget Sound region with numerous sampling locations marked by colored dots. Key geographical features labeled include Port Angeles, Marysville, Everett, Shiro, Kirkland, Almond, Seattle, Bellevue, Burien, Des Moines, Federal Way, Tacoma, Lakewood, Puyallup, South Hill, Wenatchee, Olympic National Park, and Olympic National Forest.

Landscape Analysis



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


Thanks Peter Leinenbach (EPA)!


“Excellent” Sites (≥ 42) = Protection

“Excellent” scores

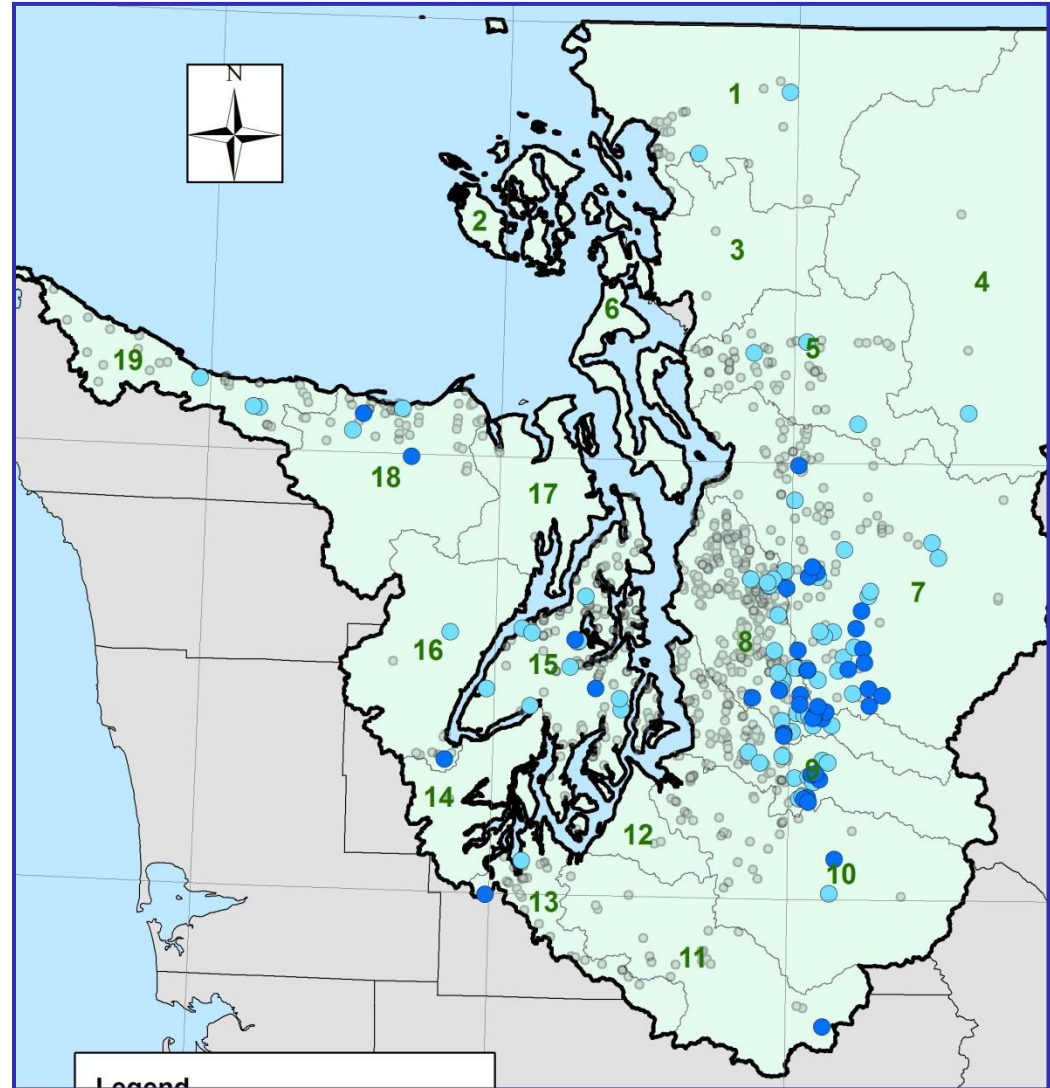
● ≥ 46

● ≥ 42 and < 46

 **121** sites scored
“excellent” at least once

 **35** sites had a median
“excellent” score

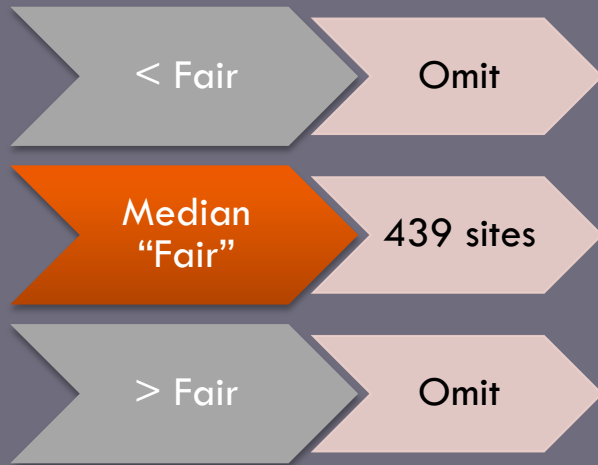
 **33** sites averaged
“excellent”



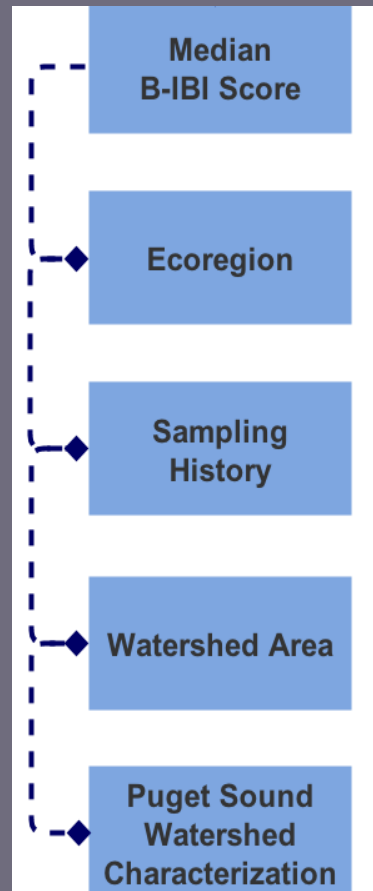
Restoration Decision Framework

Filtering

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



5 Filters



Ranking

Applied after filtering. Rank orders each site so that the sites can be prioritized.

Site	Biotic Potential Rank
Site D	1
Site X	2
Site A	3
Site C	4
Site W	5

“Fair” Sites (28-36) = Restoration

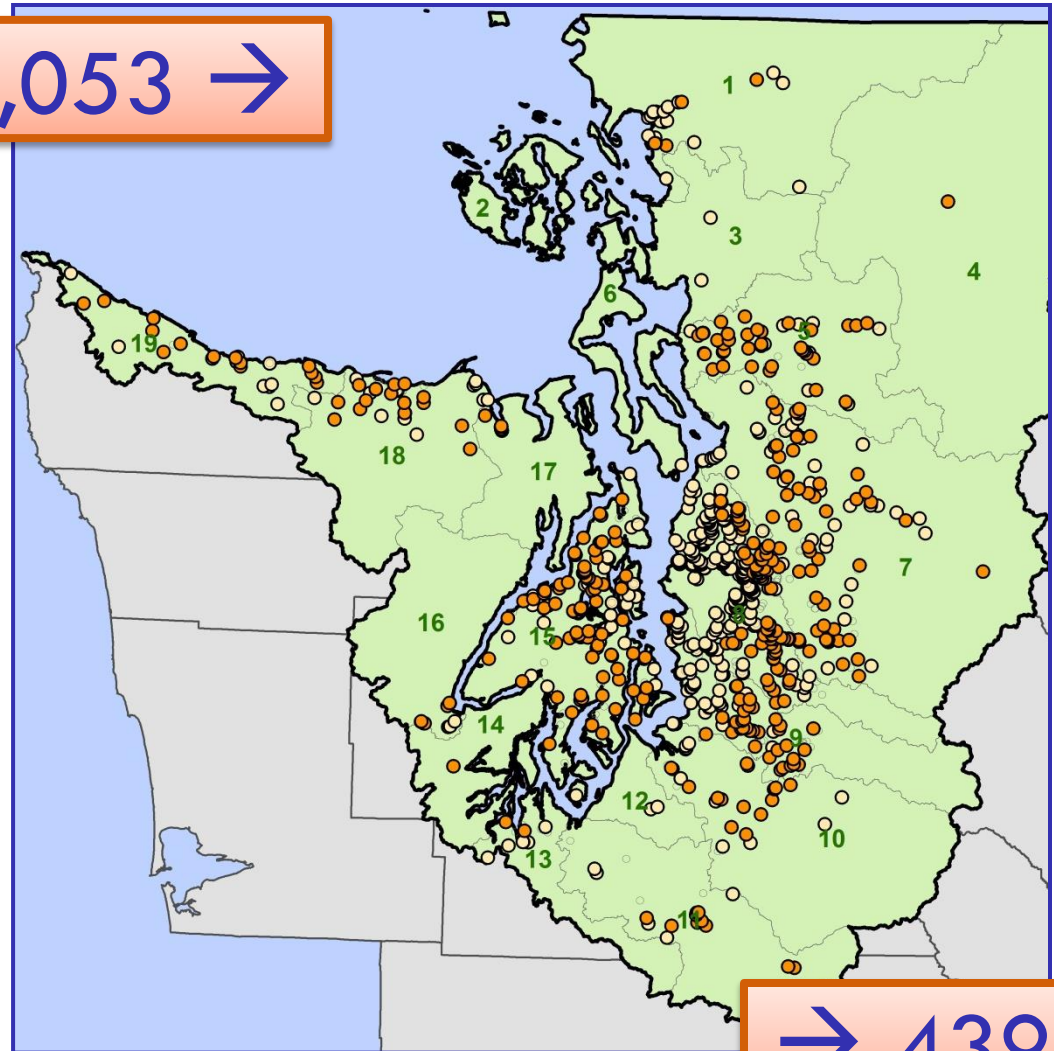
● “Fair” median

○ “Fair” at least once

1,053 →

→ 648 sites scored “fair”
at least once

→ 439 sites with median
“fair” scores

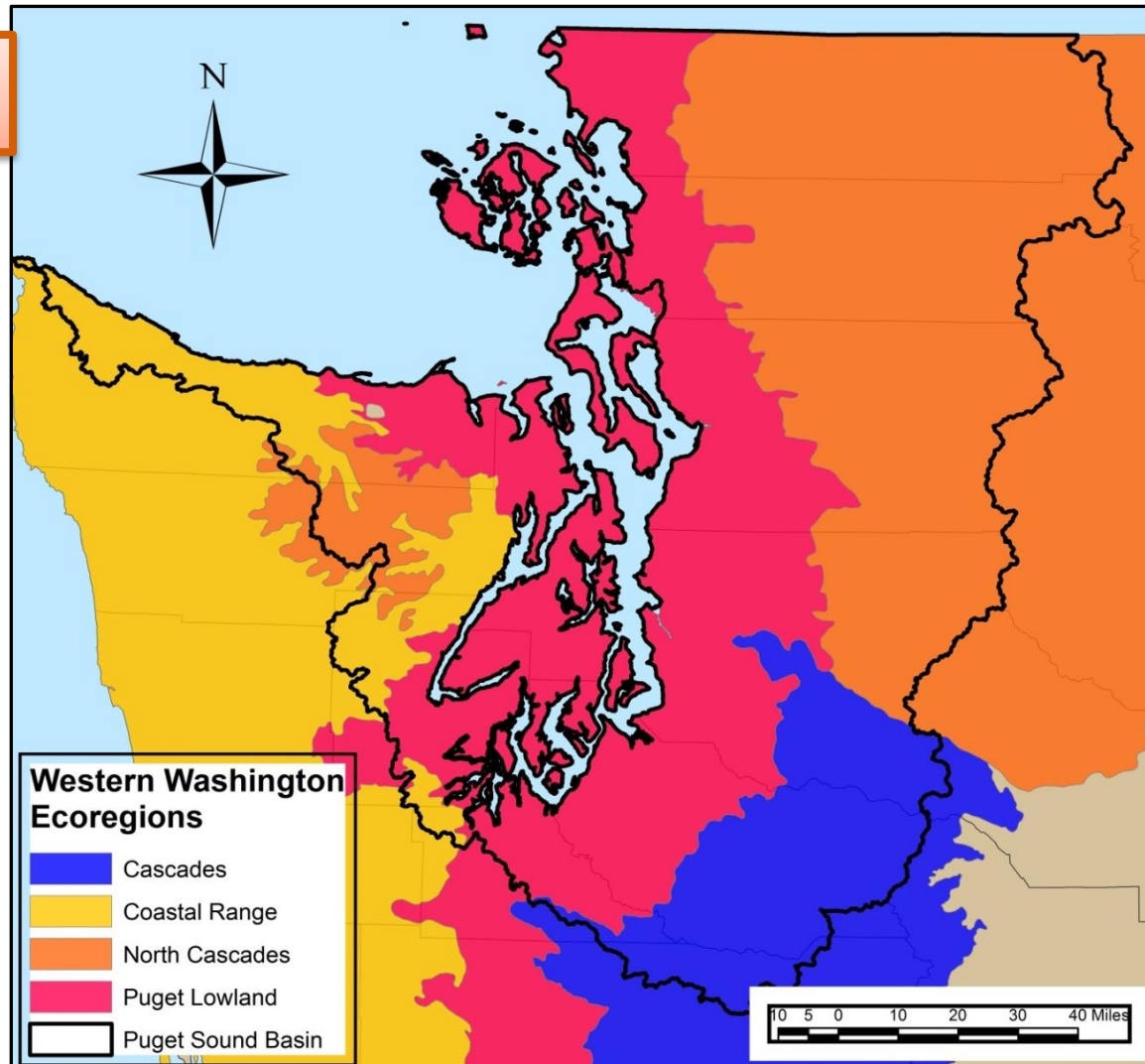


→ 439



Filtering: Ecoregion

439 →



→ 362

Filtering: Sampling History

362 →

**$N > 2$ *and*
since 2007**

OR

$N > 4$



+



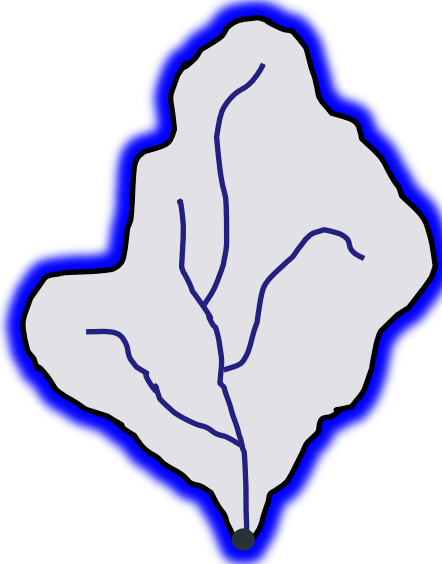
→ 174

Filtering: Watershed Area

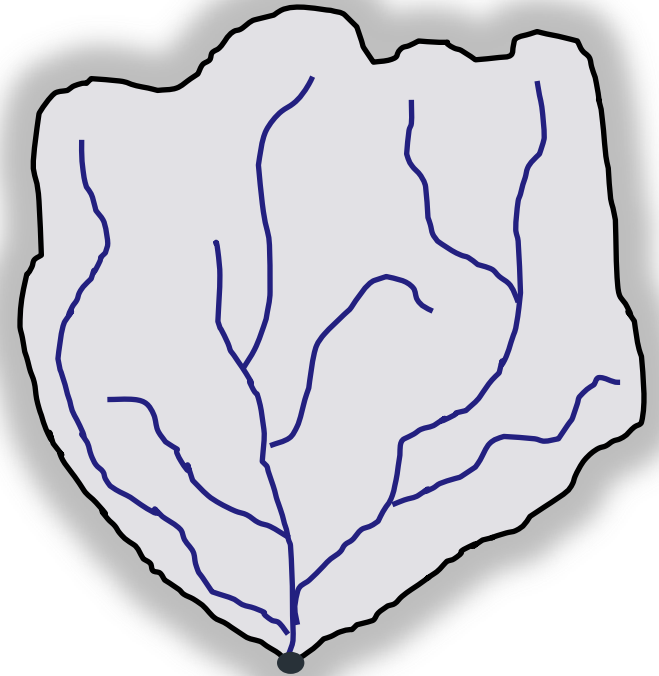
174 →



<200 Acres:
Too Small



200-3000 Acres:
Just Right



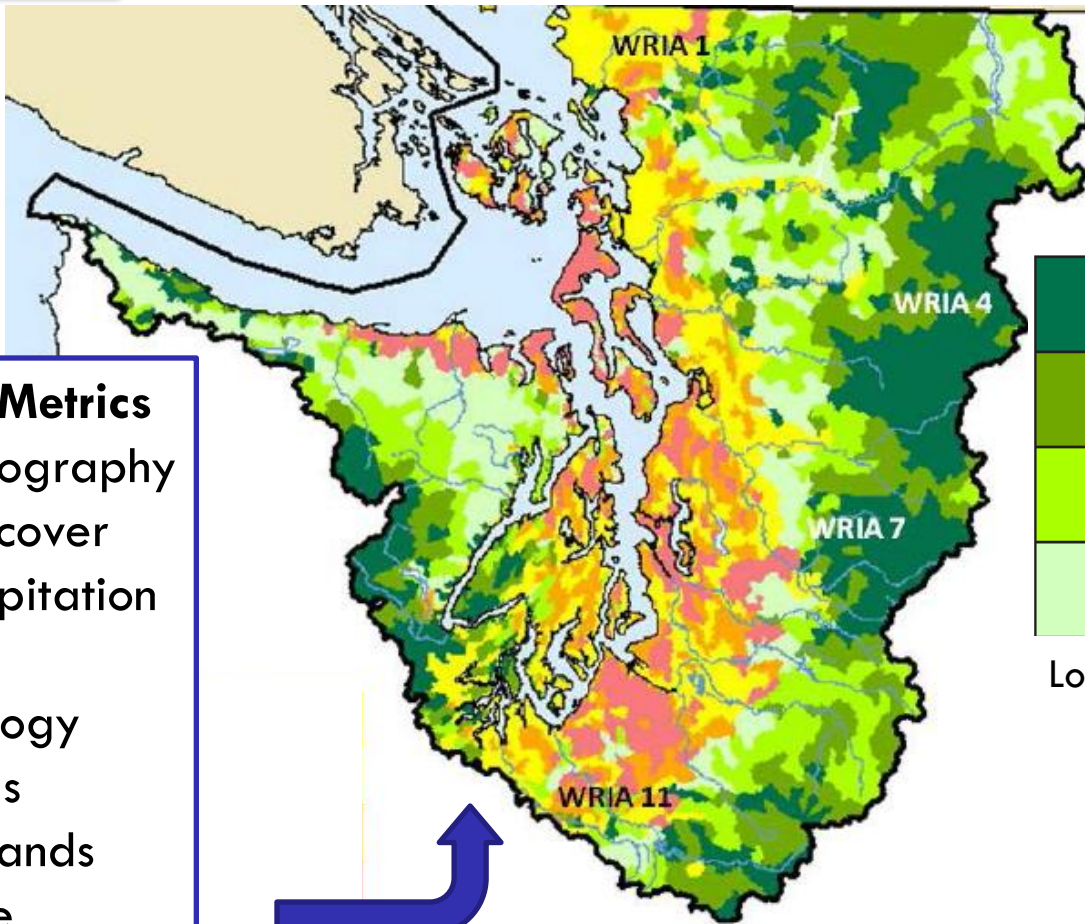
>3000 Acres:
Too Big

→ 81

Filtering: PS Watershed Characterization

81 →

Water Flow Processes Model



PSWC Metrics

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

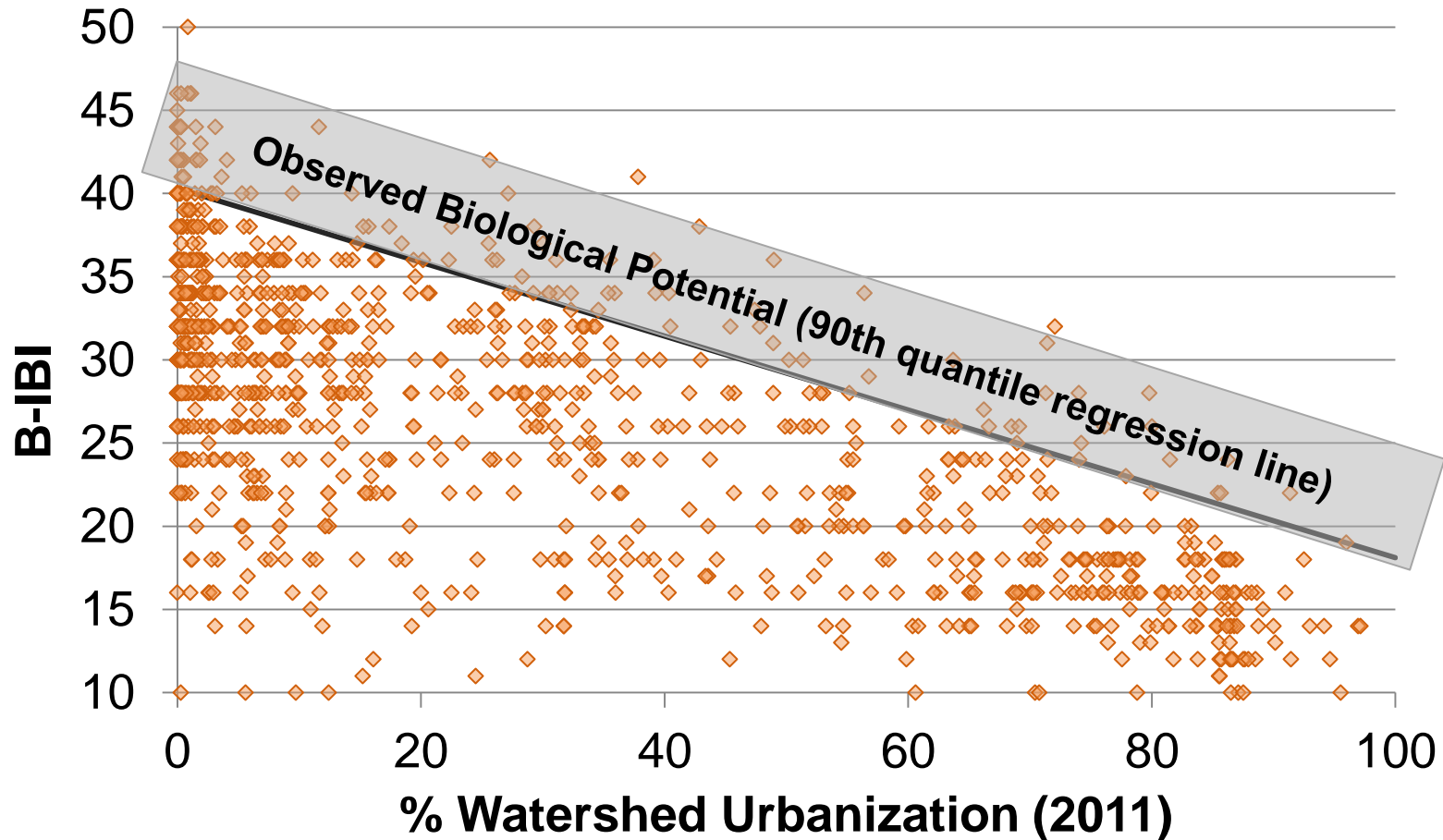
Highest Protection	Highest Restoration
High Protection	High Restoration
Low Protection	Low Restoration
Lowest Protection	Lowest Restoration

Low DEGRADATION High

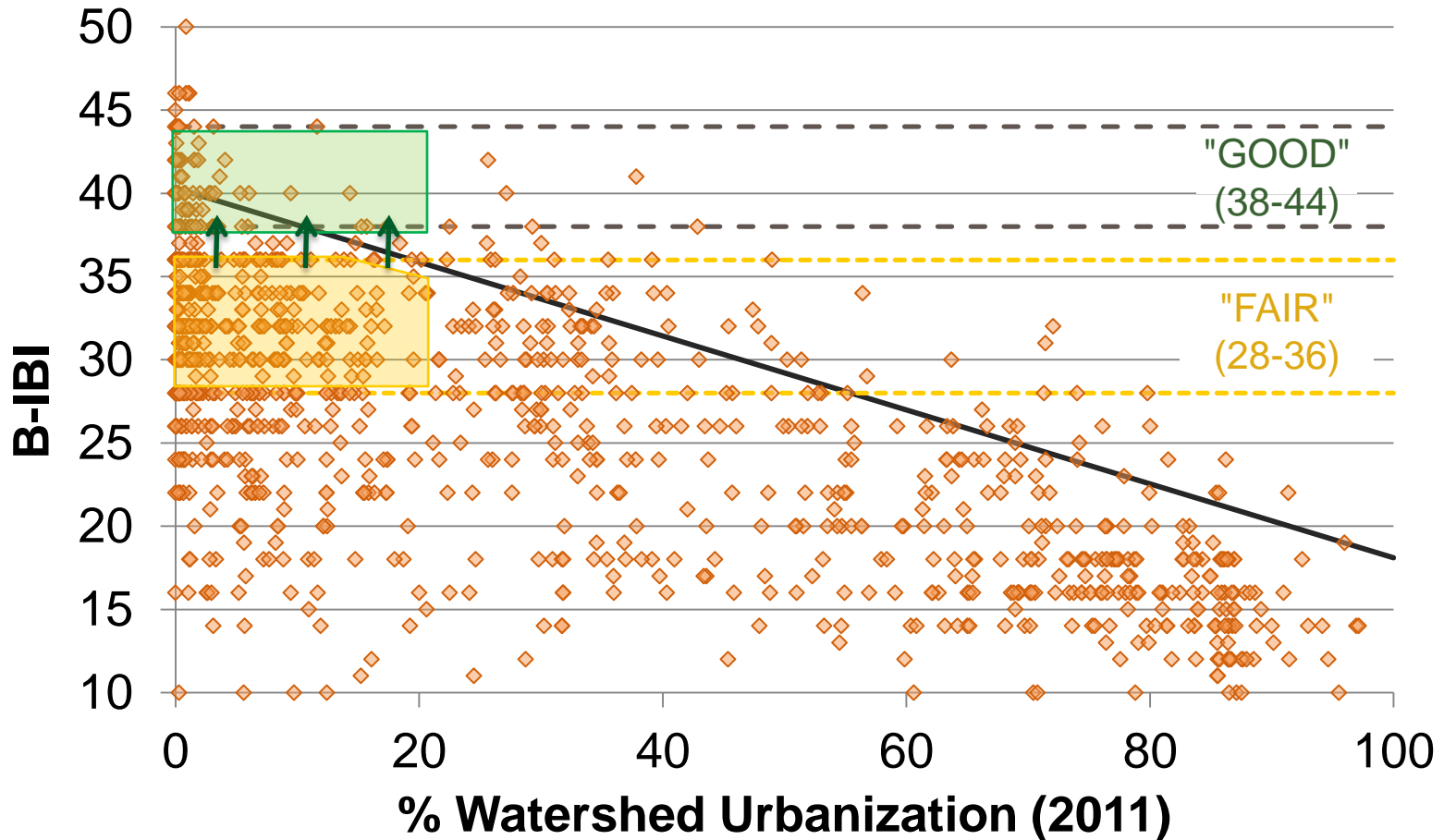
Low IMPORTANCE High

→ 59

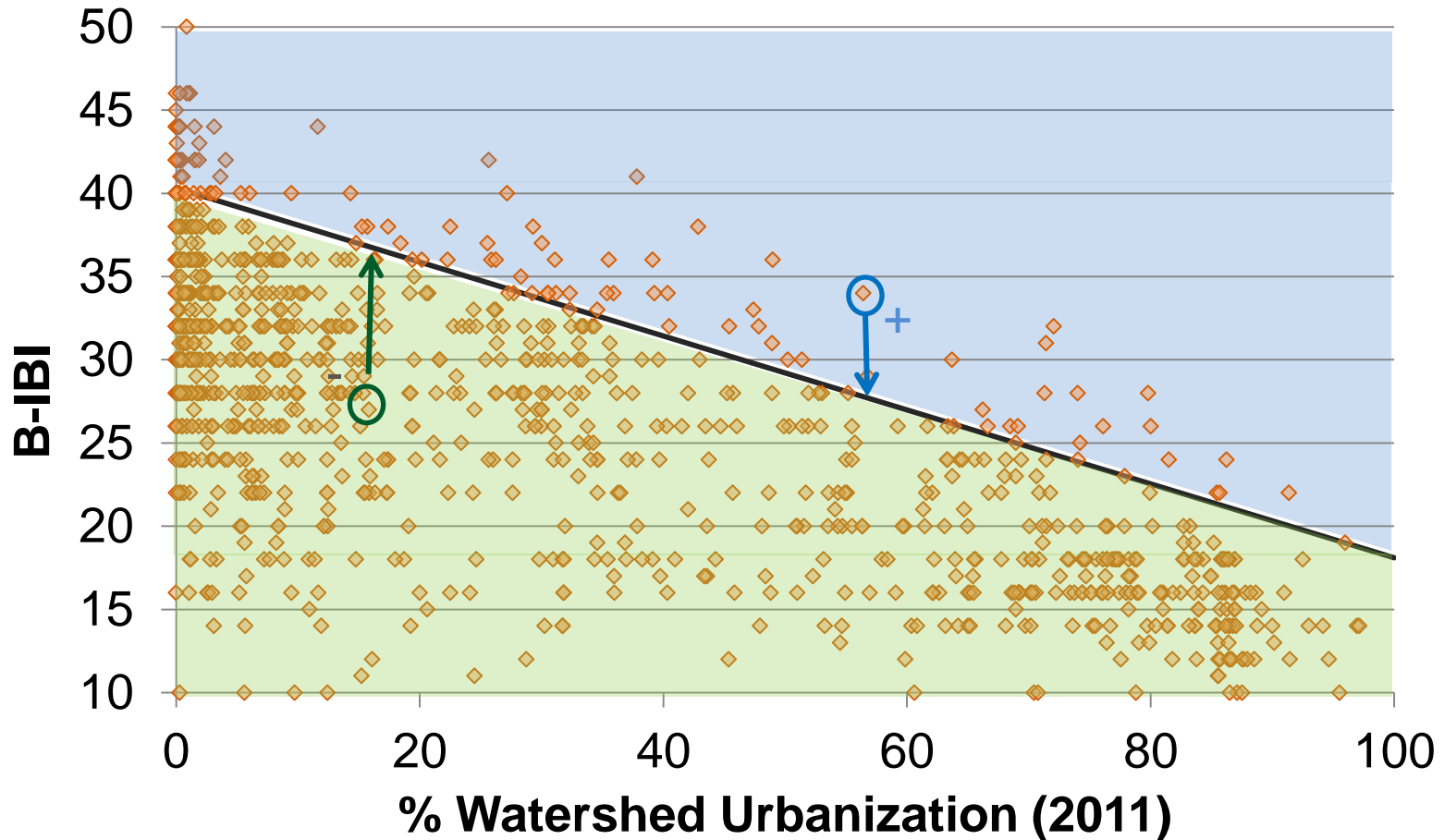
Ranking: Biological Potential



Ranking: Biological Potential

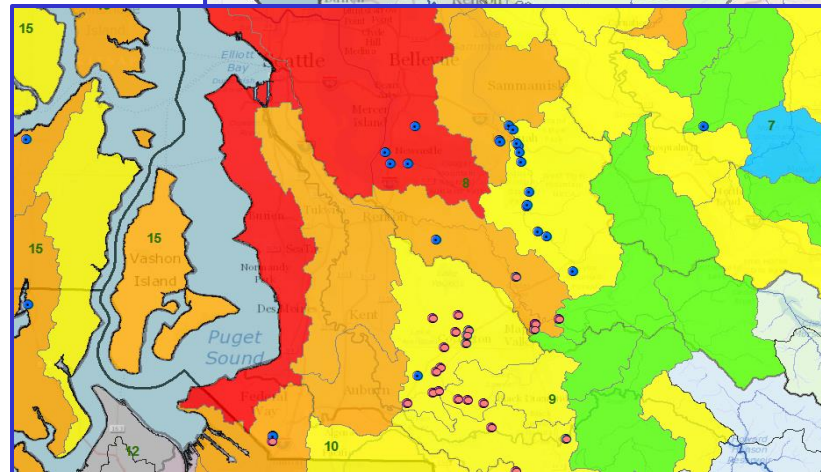
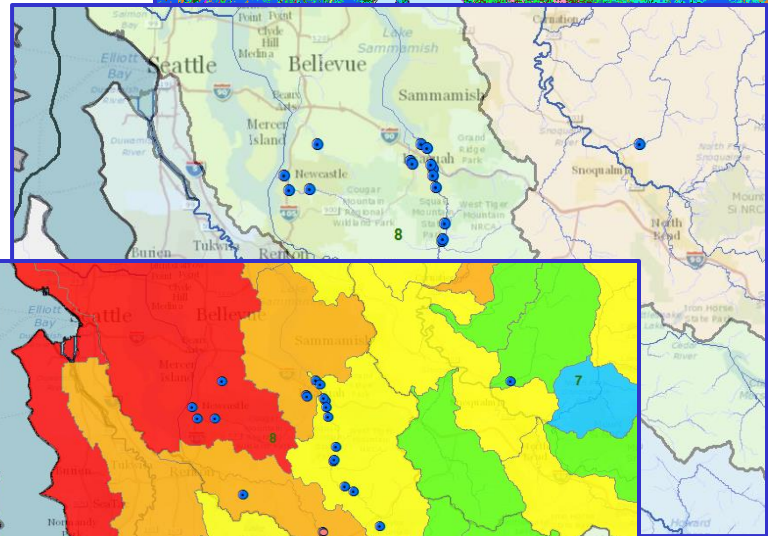
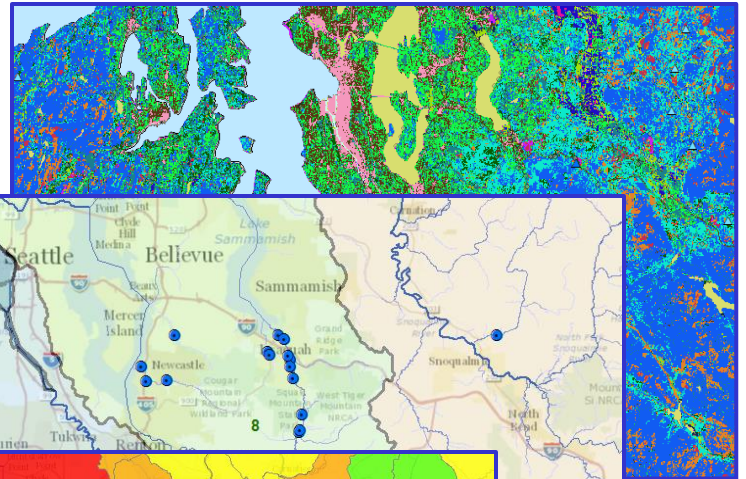


Ranking: Biological Potential

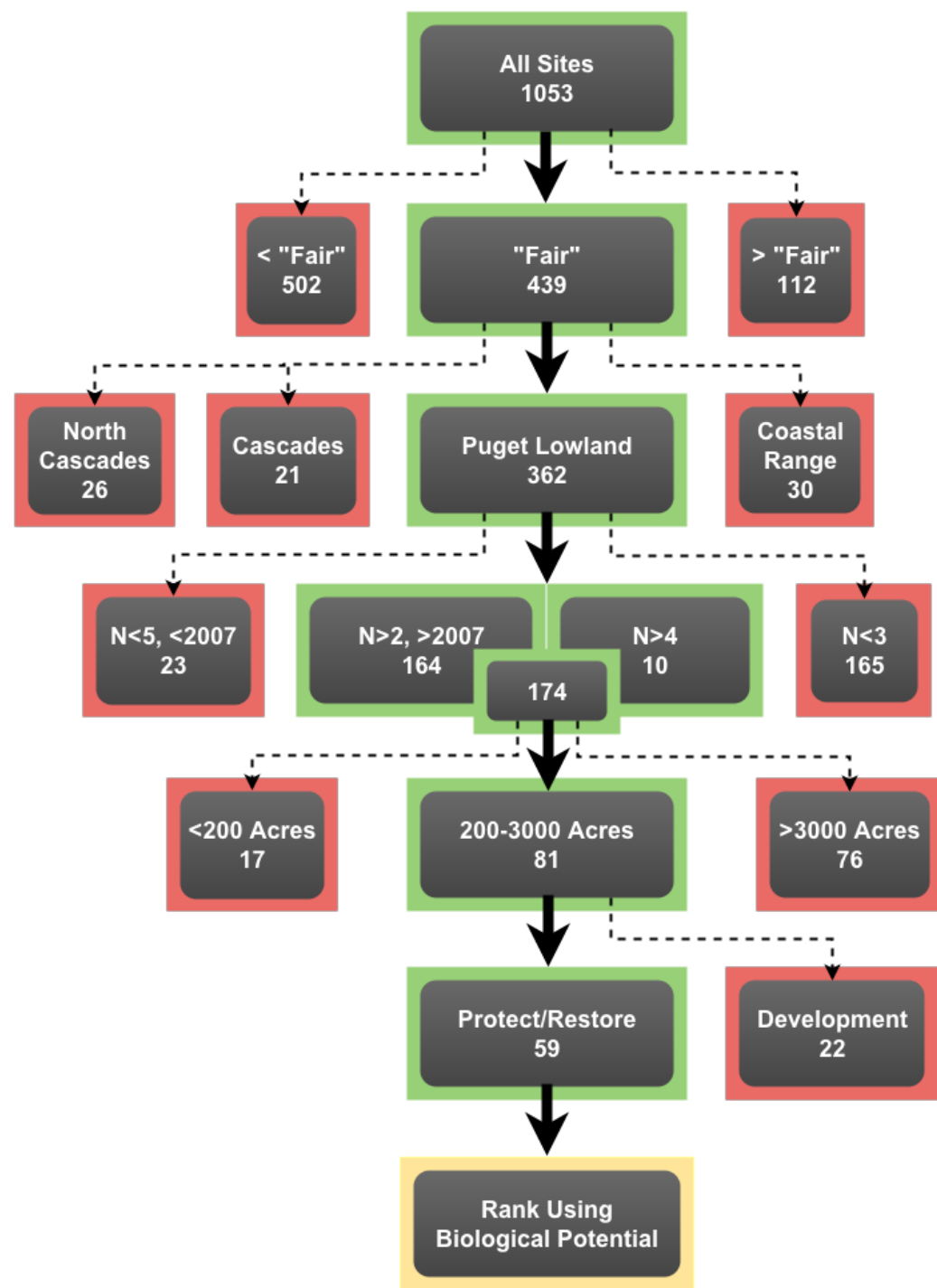
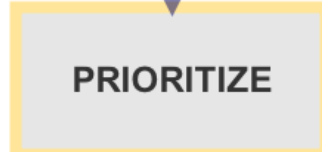
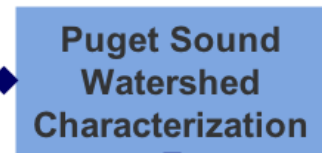
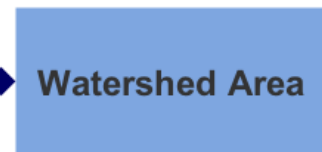


Other Criteria Considered

- Threatened/endangered fish presence
- Watershed context
- Land ownership
- Urban growth area
- Habitat connectivity
- Hydrology

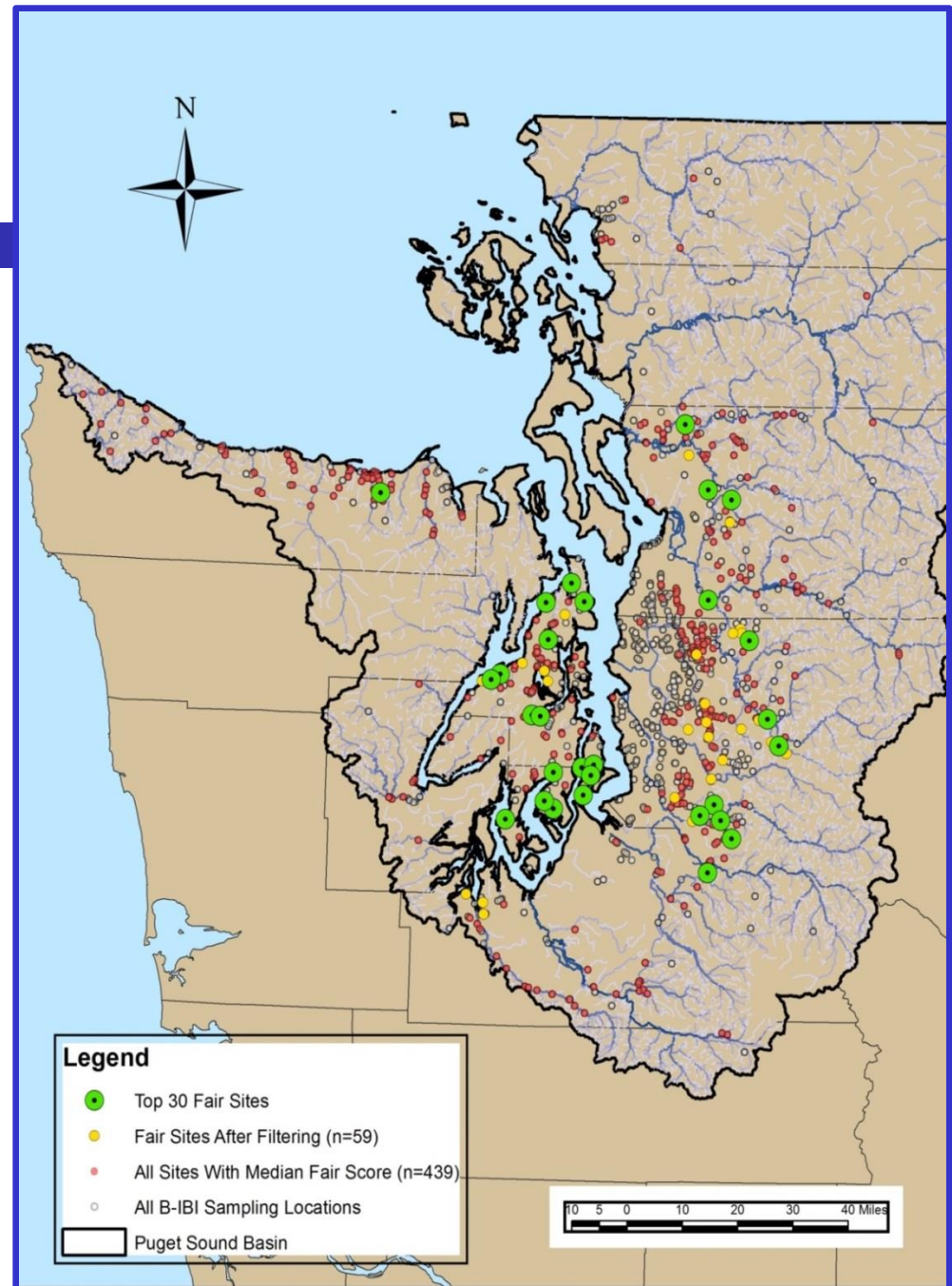


Recap:



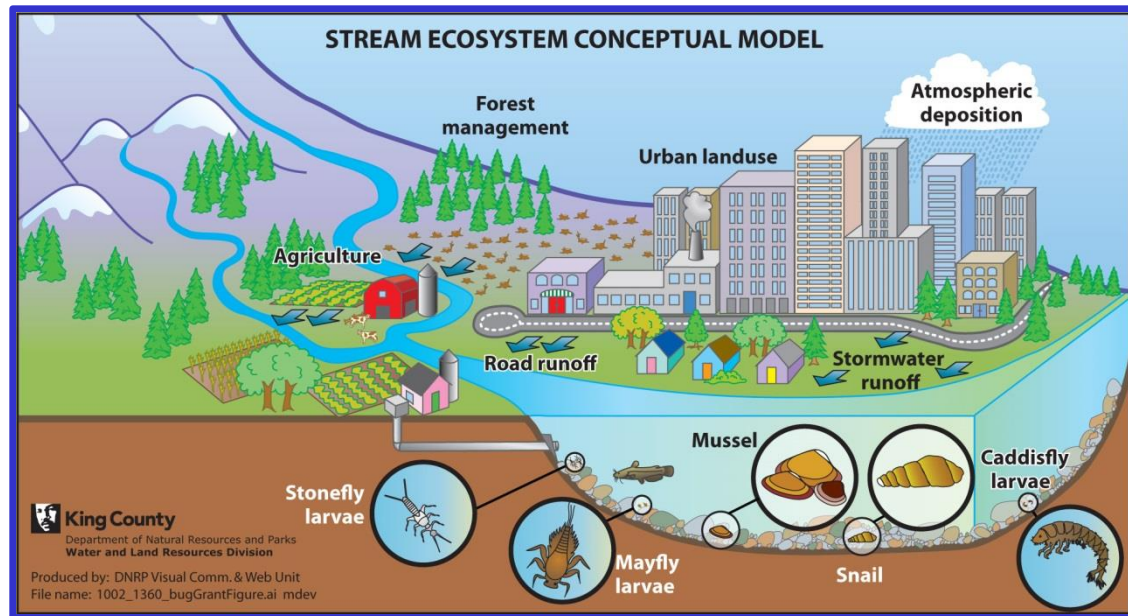
Top 30 sites

WRIA #	WRIA Name	Sites in Top 30
5	Stillaguamish	1
7	Snohomish	6
9	Duwamish-Green	9
10	Puyallup-White	1
15	Kitsap	12
18	Elwha-Dungeness	1



Next Steps

- 🐛 Outreach to local experts who know the basins
- 🐛 Identify key basin stressors
 - 🐛 Puget Sound watershed characterization
 - 🐛 Biological potential (metrics)
 - 🐛 Aerial photos
 - 🐛 Landscape data



Next Steps: **Restoration**

What is Feasible? Effective?

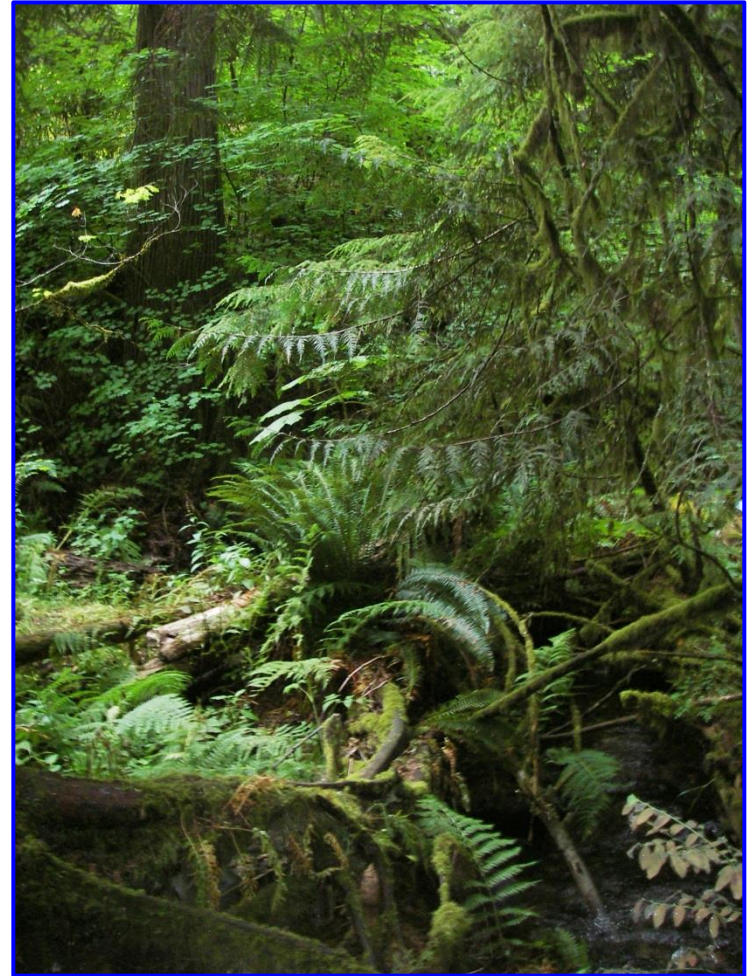
- Habitat improvements
- Riparian plantings
- Stormwater retrofits
- Agriculture BMPs
- Education/outreach
- Legislation
- Incentives
- Seeding inverts...



Next Steps: **Preservation**

Strategies to preserve excellent sites

- Land purchase
- Conservation easements
- Development rights



Project Web Page:

<http://pugetsoundstreambenthos.org/Projects/Restoration-Priorities-2014.aspx>

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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 ecosystem recovery targets. This project is intended to manage urban runoff at the basin and watershed scale.

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

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

King County will also develop strategies for preserving ba purchase, conservation easement purchase, and transfe

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 County)

PS Watershed Characterization:

Ecology: Colin Hume, Susan Grigsby, Stephen Stanley, Kelly Slattery

WDFW: George Wilhere

Ecology (Project Administration):

Doug Howie, Tom Gries, Kim Harper, Kirsten Weinmeister

Stakeholder Workgroup



The background of the slide is a photograph of a stream. In the foreground, several dark, segmented aquatic insects, likely stoneflies, are resting on a piece of weathered wood. The water is clear, and the stream bed is composed of various sized rocks and pebbles. The lighting is natural, suggesting an outdoor setting.

?’s / Suggestions / Success Stories

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