

# 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



**King County**

Department of  
Natural Resources and Parks  
**Water and Land Resources Division**

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”

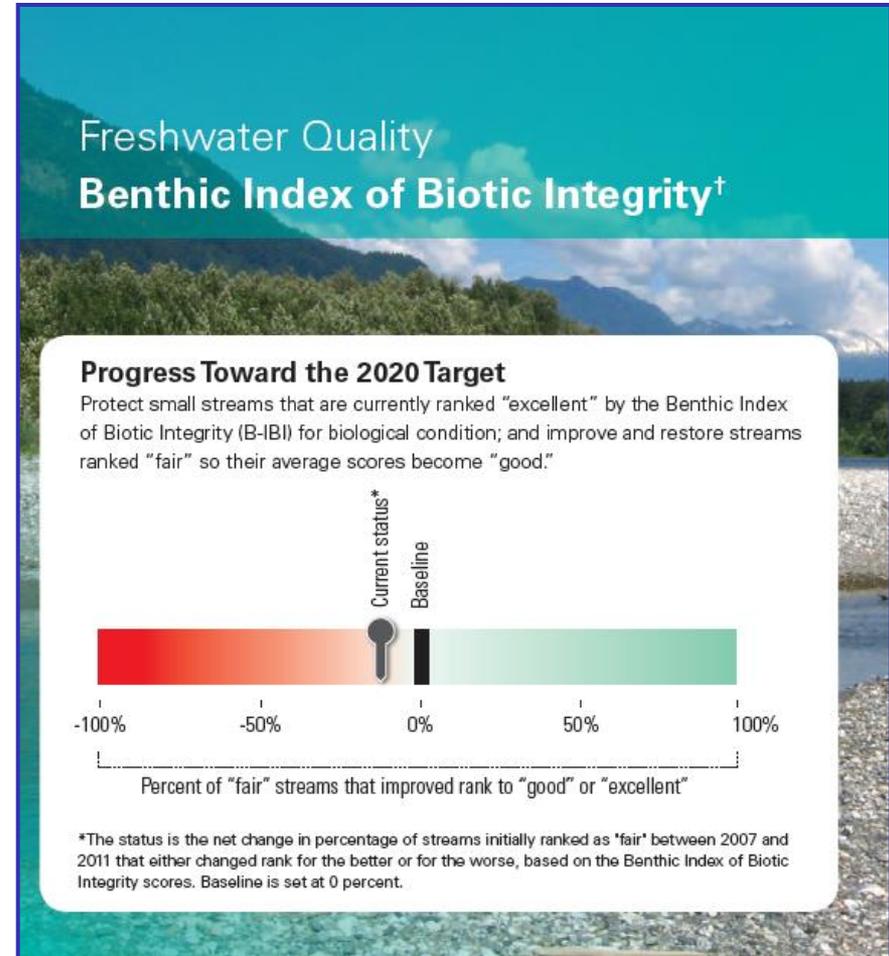


# PSP Report Card

 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)



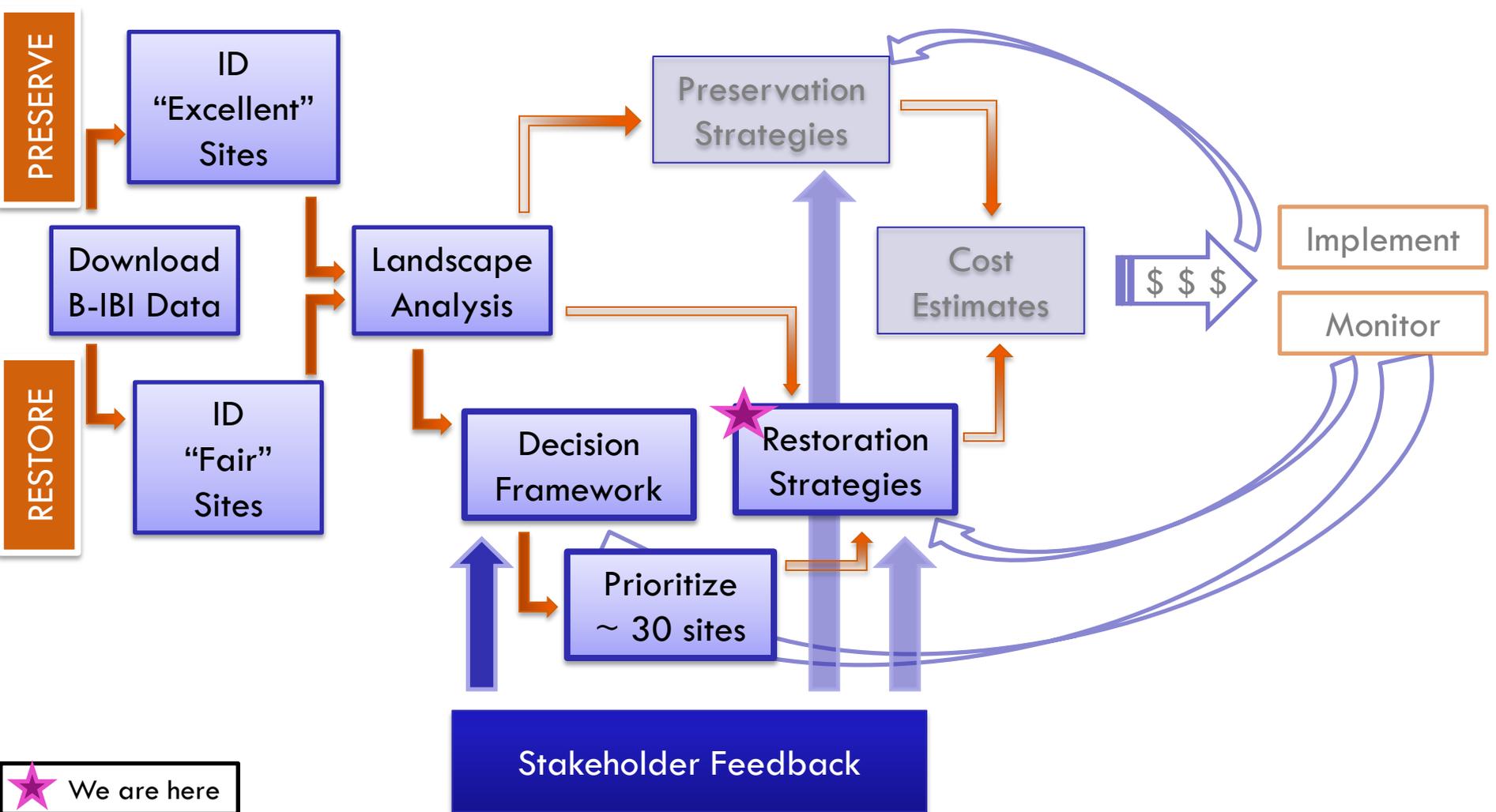
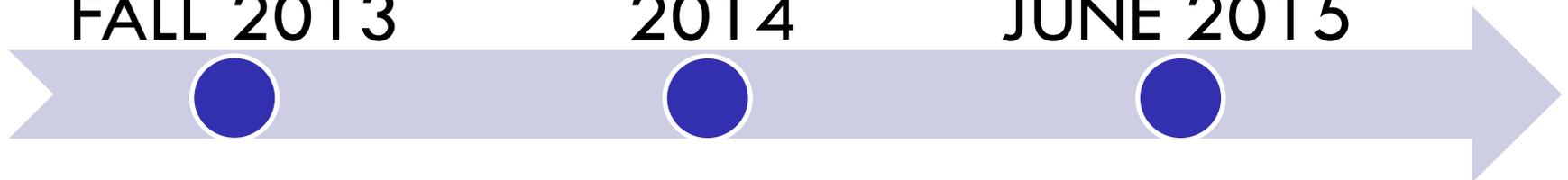
# Limits and Opportunities

- 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



★ We are here

# Download B-IBI Data:

[www.pugetsoundstreambenthos.org](http://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 include the Olympic National Park and National Forest, and cities such as Port Angeles, Marysville, Everett, Seattle, Tacoma, and Puyallup. The map also shows major water bodies and rivers like the Cowlitz, Lewis, and Wenatchee.

# “Excellent” Sites ( $\geq 42$ ) = Protection

“Excellent” scores

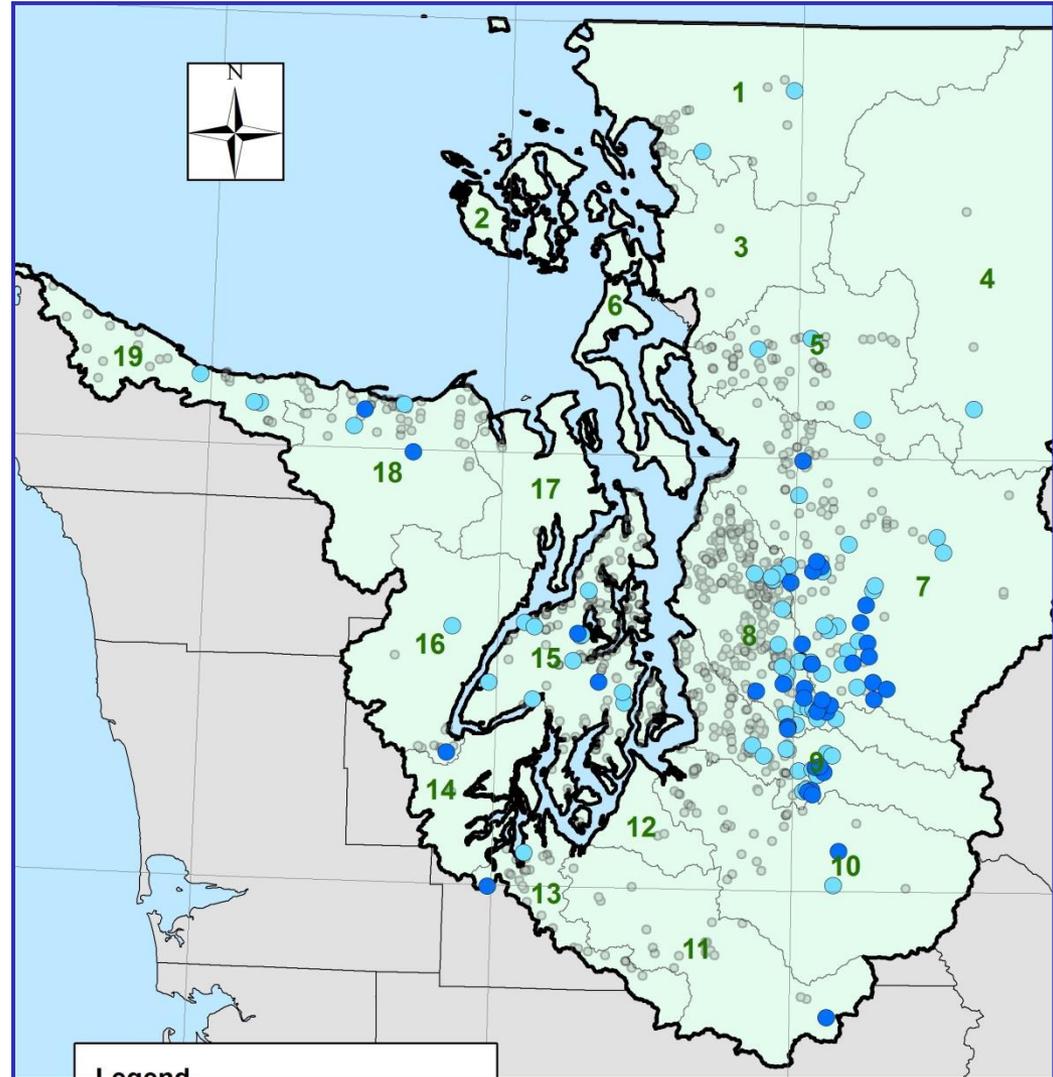
●  $\geq 46$

●  $\geq 42$  and  $< 46$

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

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

 **33** sites averaged  
“excellent”



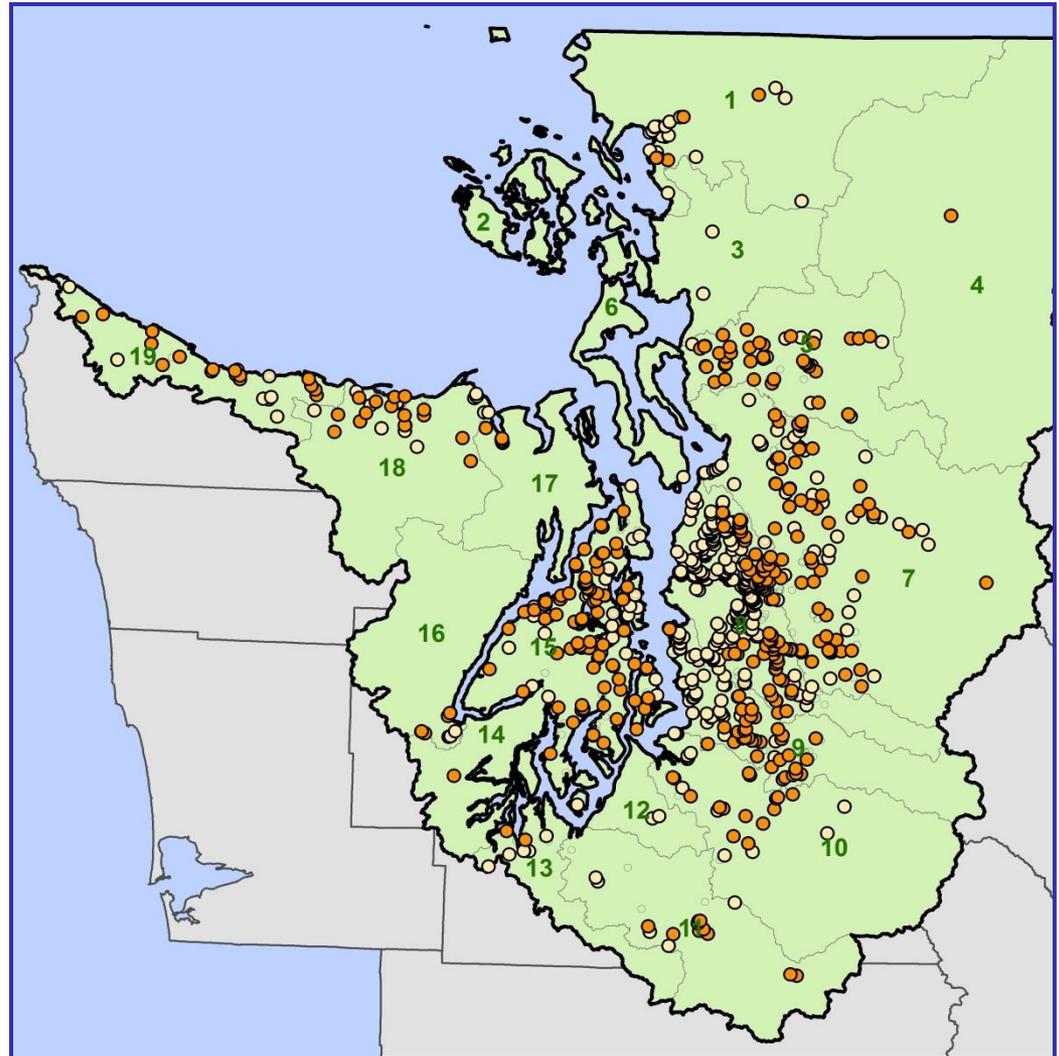
# “Fair” Sites (28-36) = Restoration

● “Fair” average

○ “Fair” at least once

🐜 **648** sites scored “fair”  
at least once

🐜 **439** sites with median  
“fair” scores

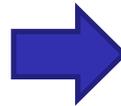
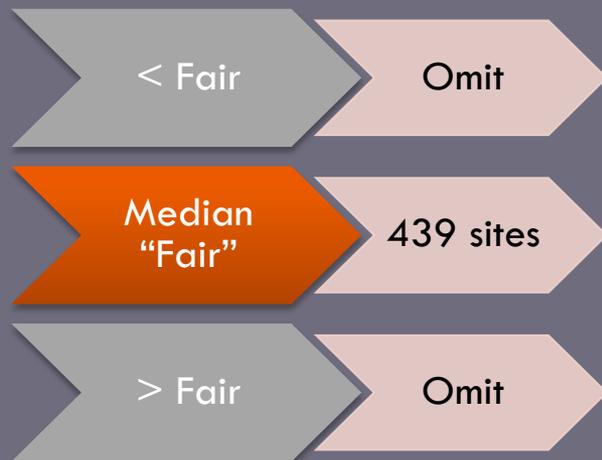


# Restoration Decision Framework

## Part 1

### Filtering

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



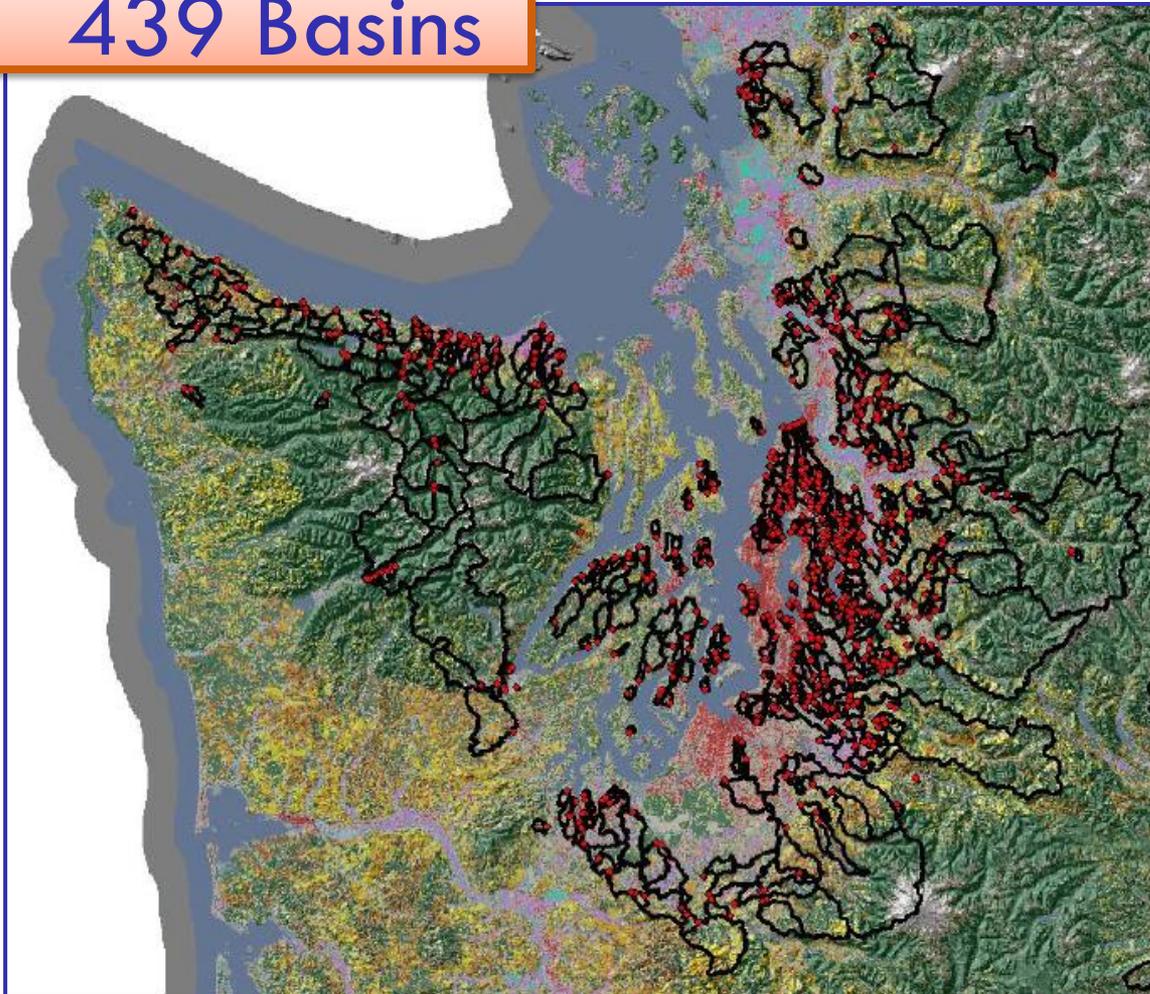
## Part 2

### 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

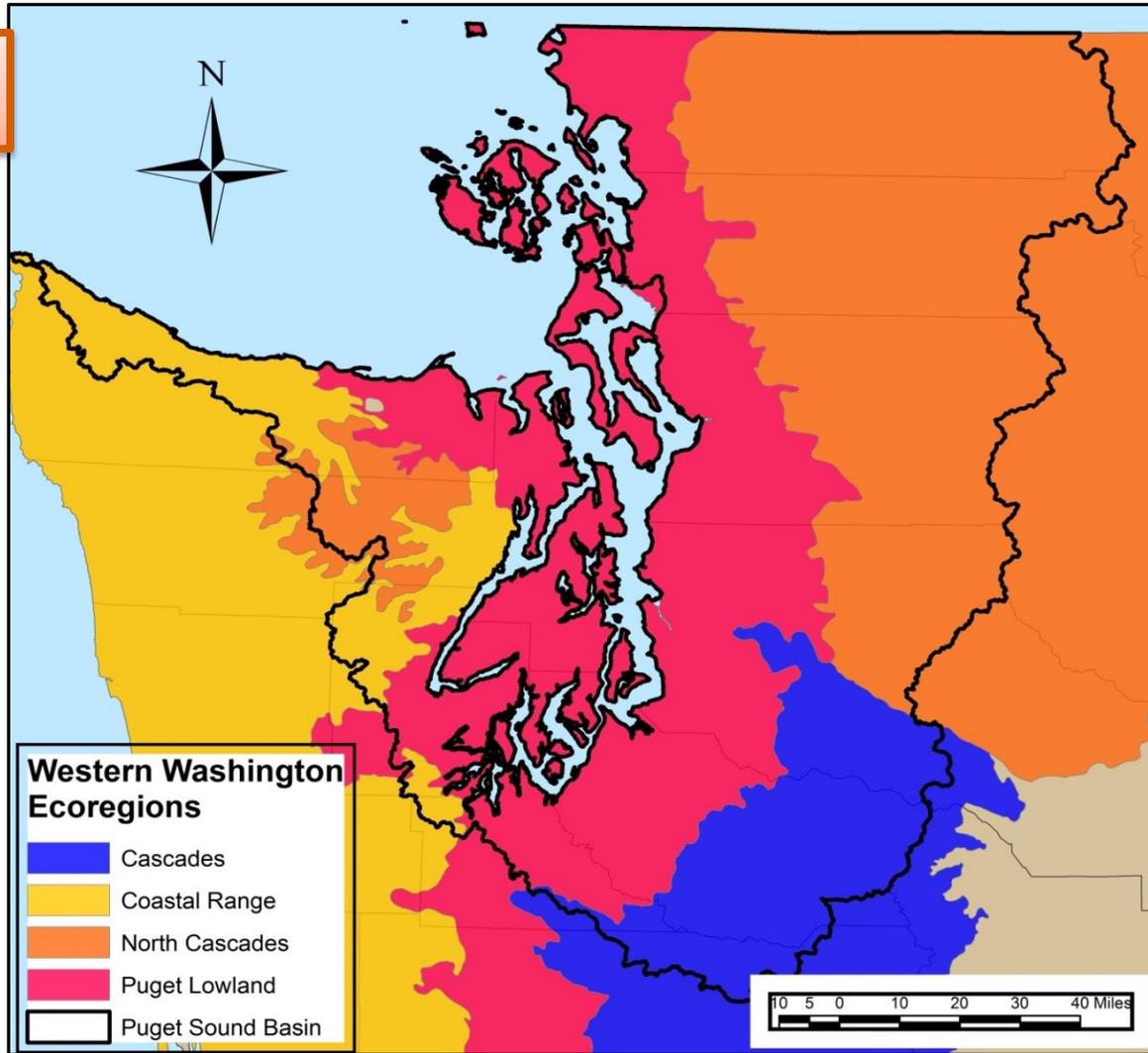


- Basin delineation
- Scale
  - Watershed
  - Local (1 km)
  - Buffer (90-m)
- Metrics
  - Landcover
  - Geology
  - Site characteristics



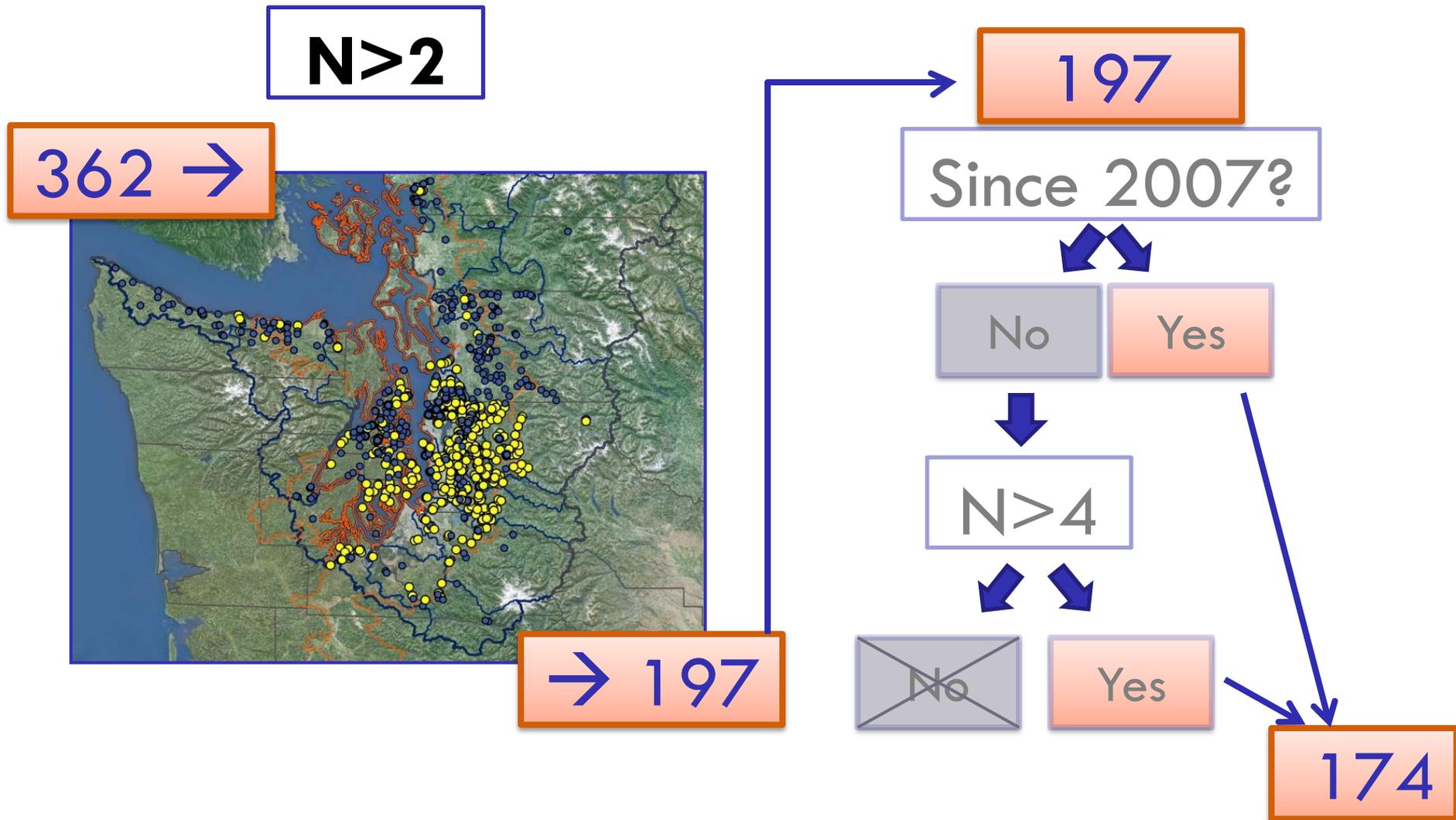
# Filtering: Ecoregion

439 →



→ 362

# Filtering: Sampling History

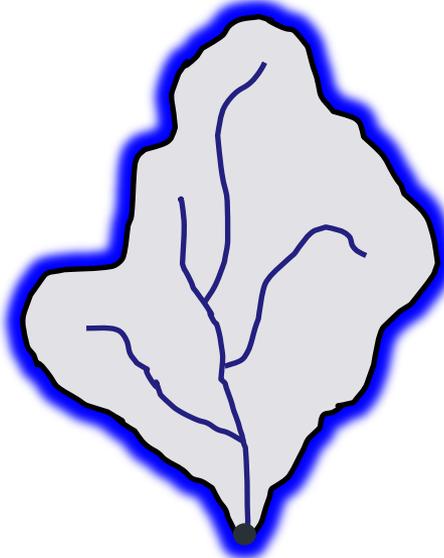


# Filtering: Watershed Area

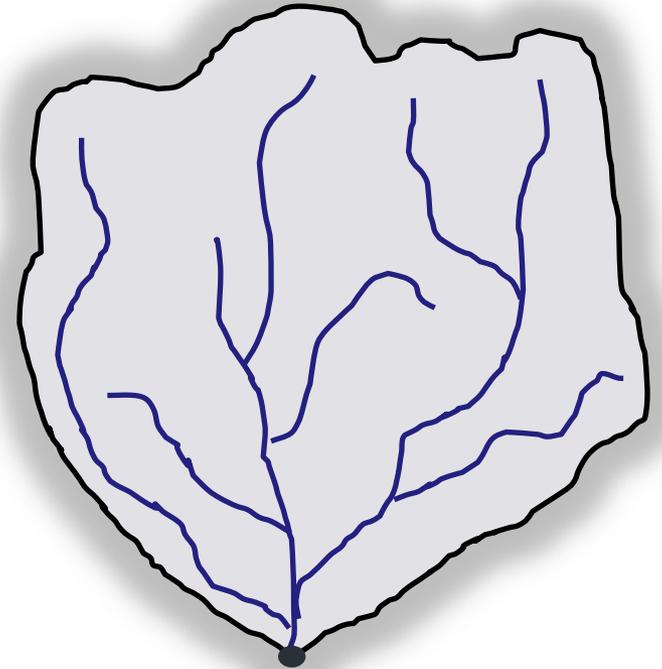
174 →



<200 Acres:  
Too Small



200-3000 Acres:  
Just Right



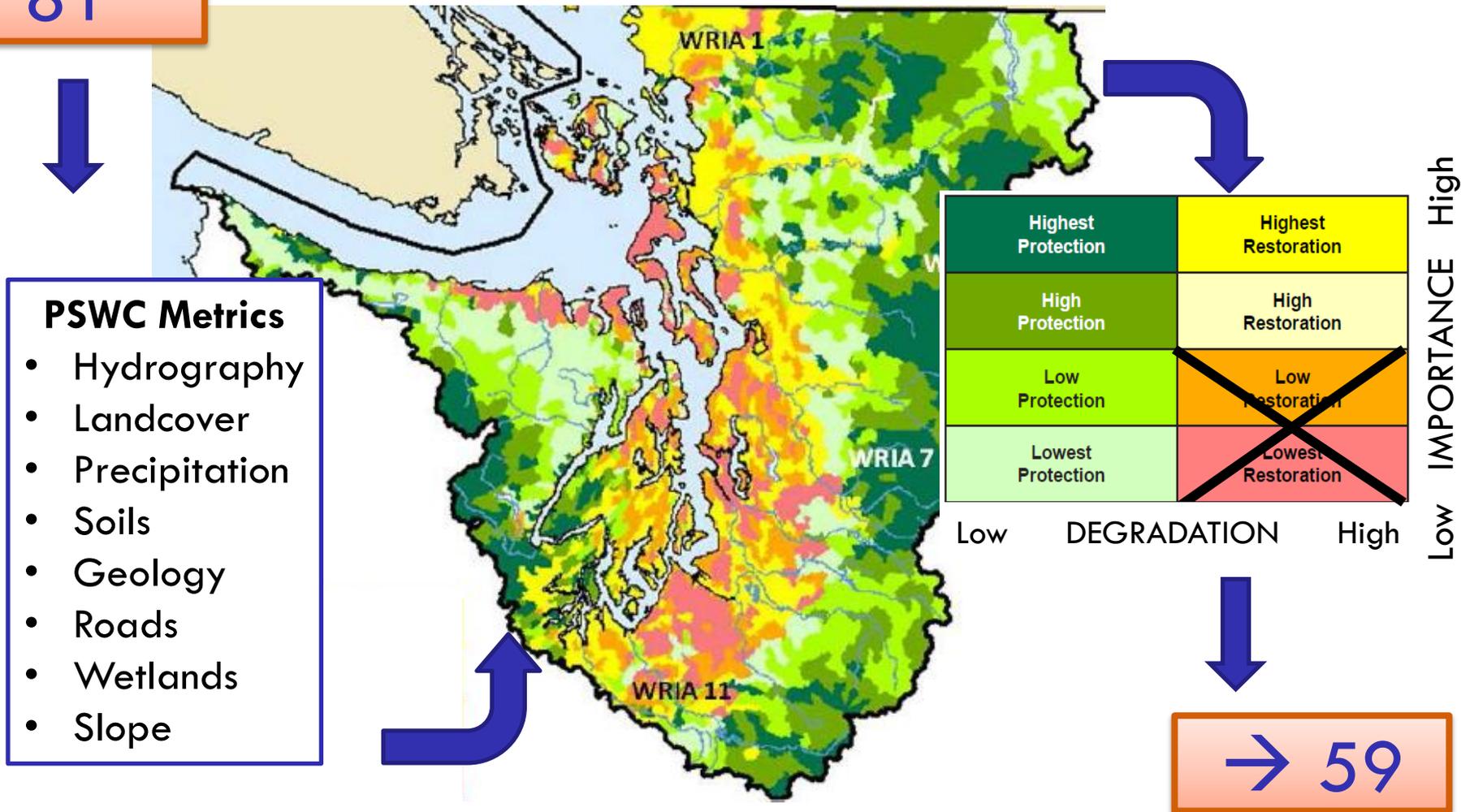
>3000 Acres:  
Too Big

→ 81

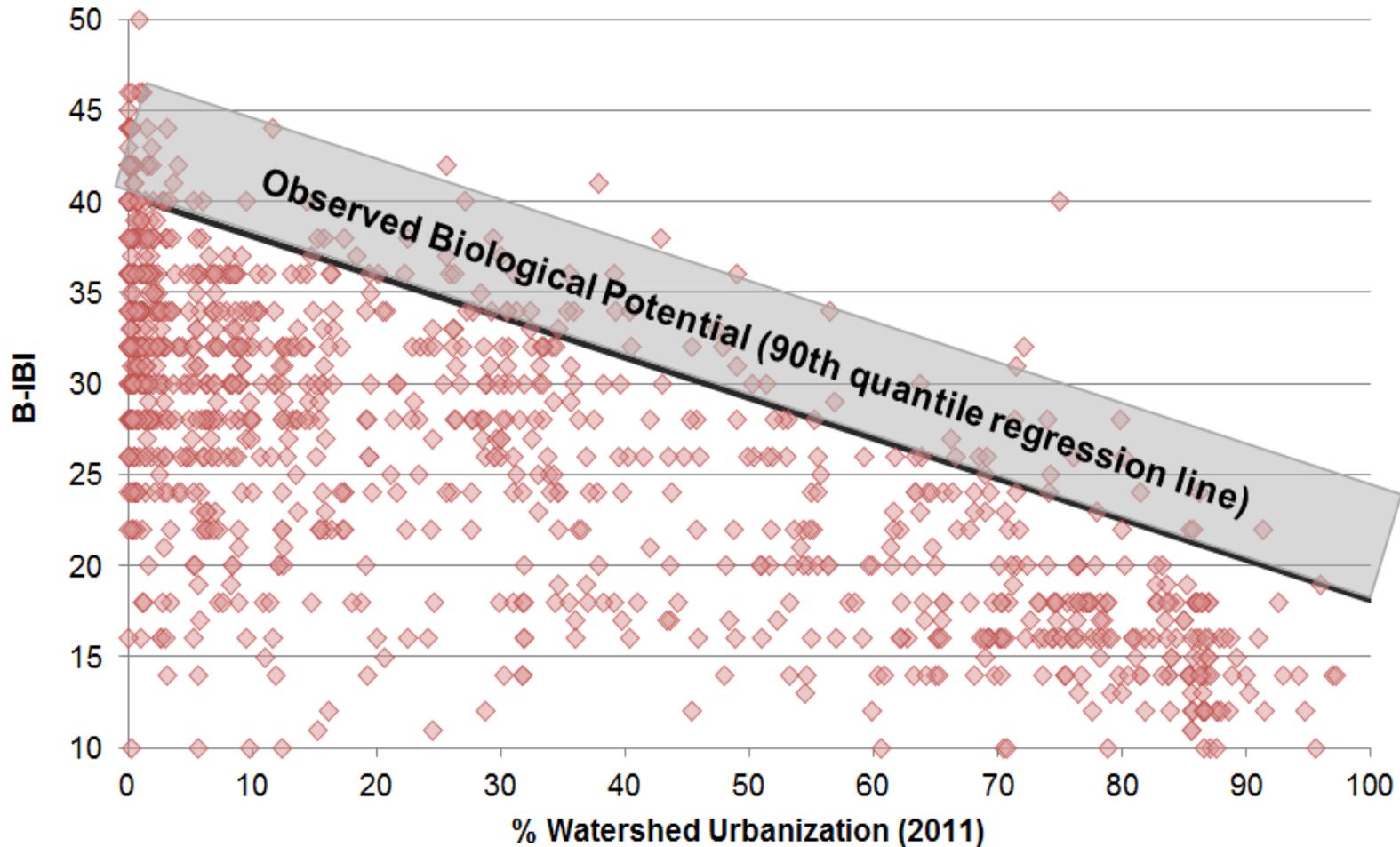
# Filtering: PSWC

81

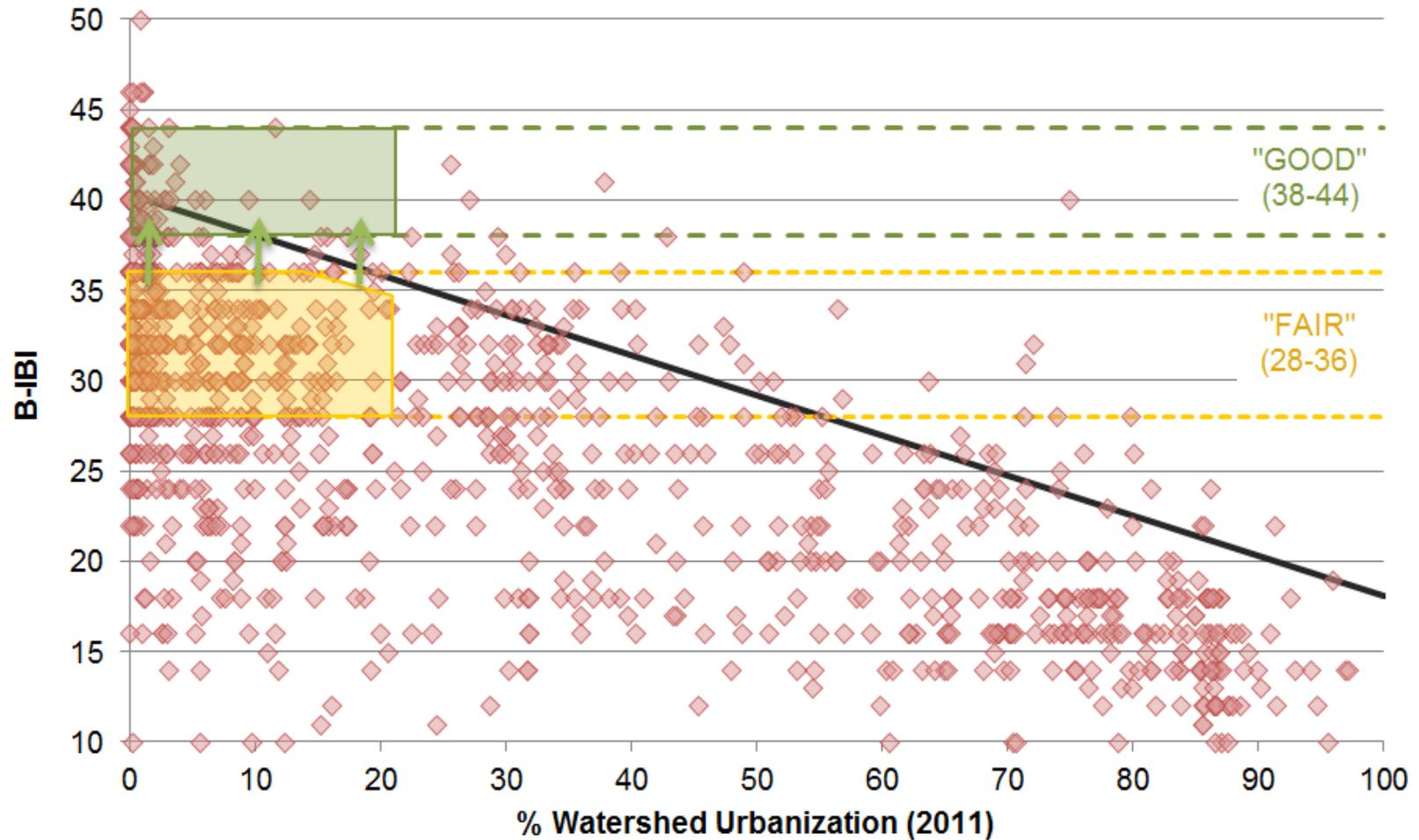
## PS Watershed Characterization



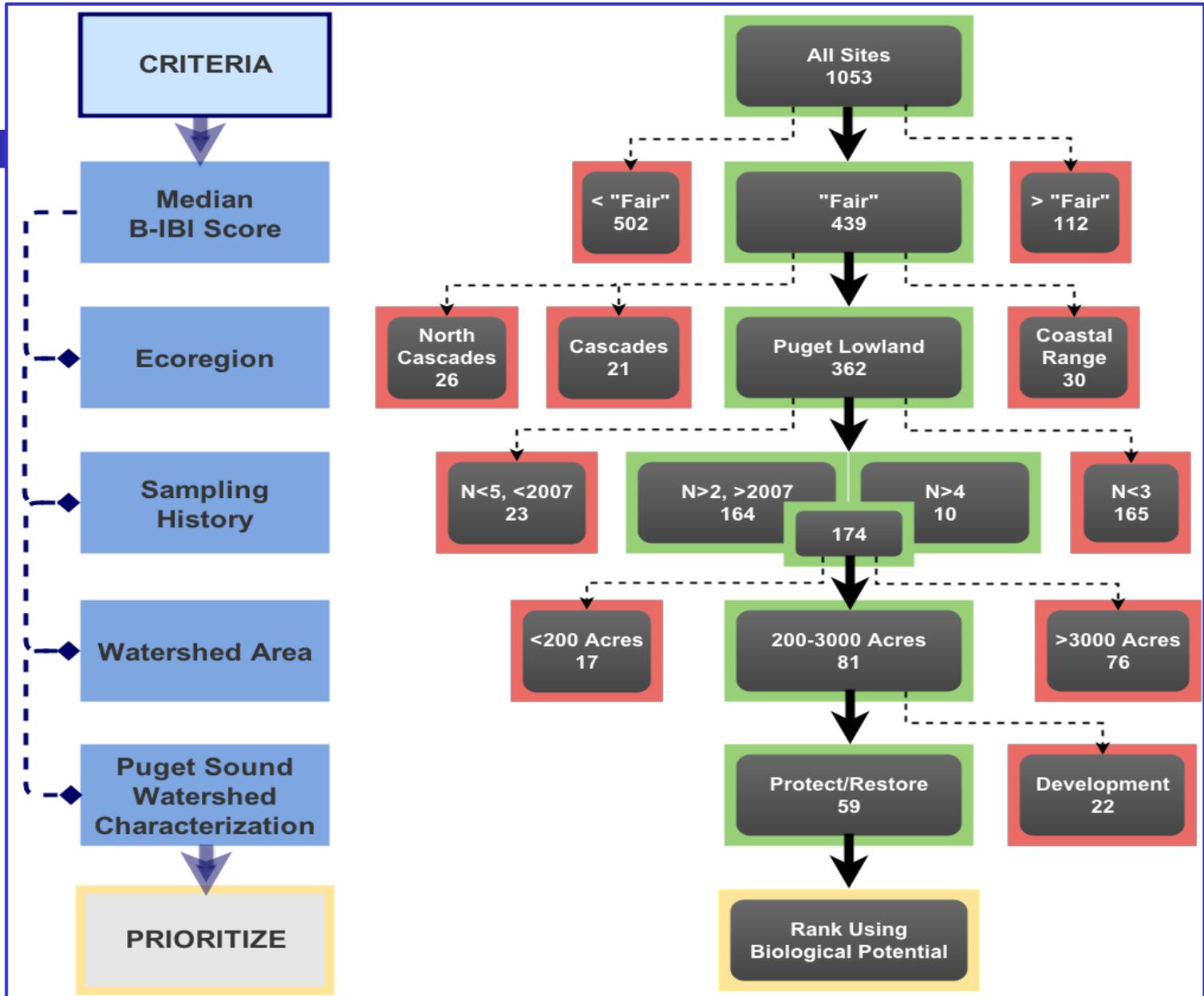
# Ranking: Biotic Potential



# Ranking: Biotic Potential

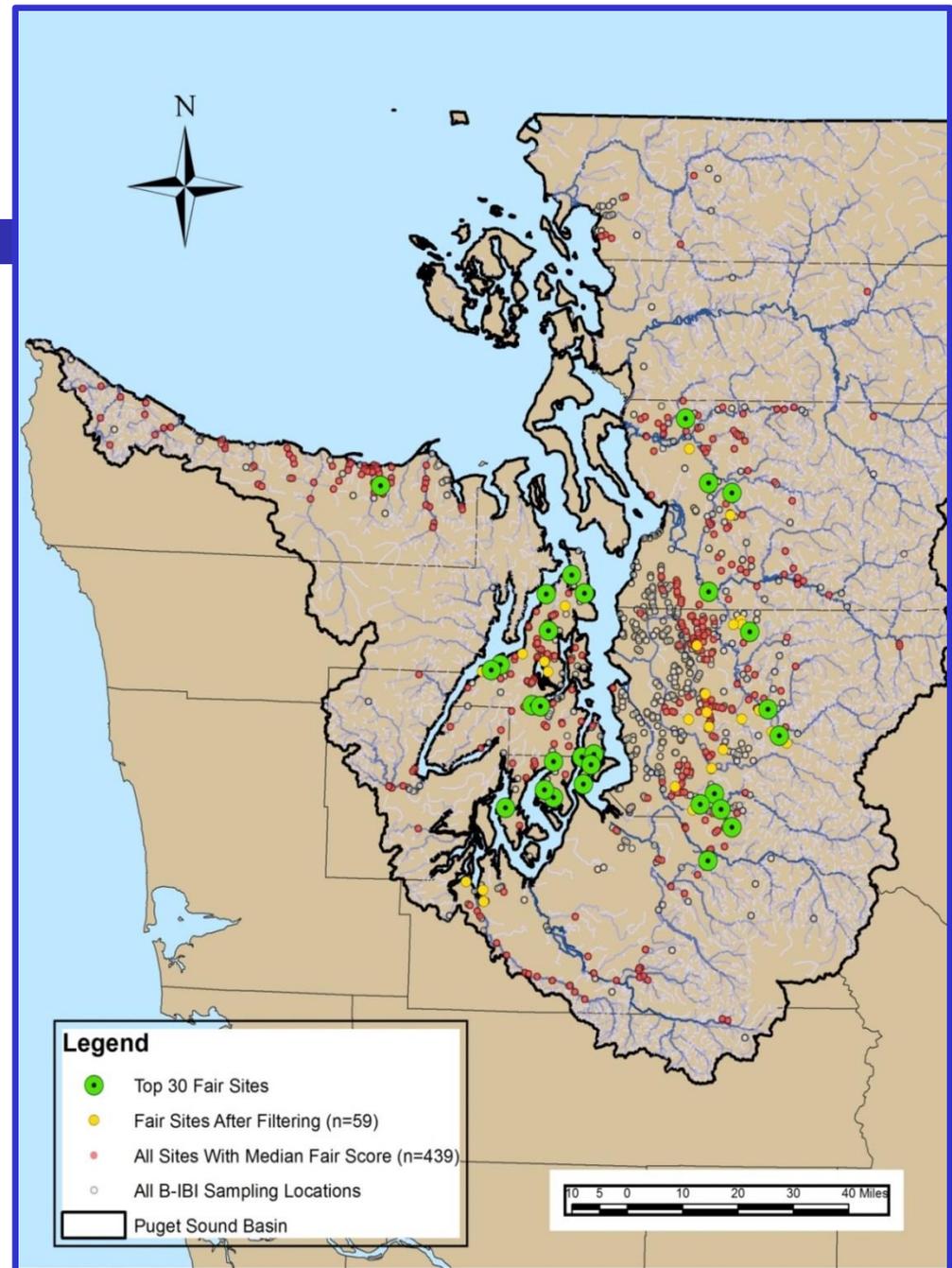


# Recap:



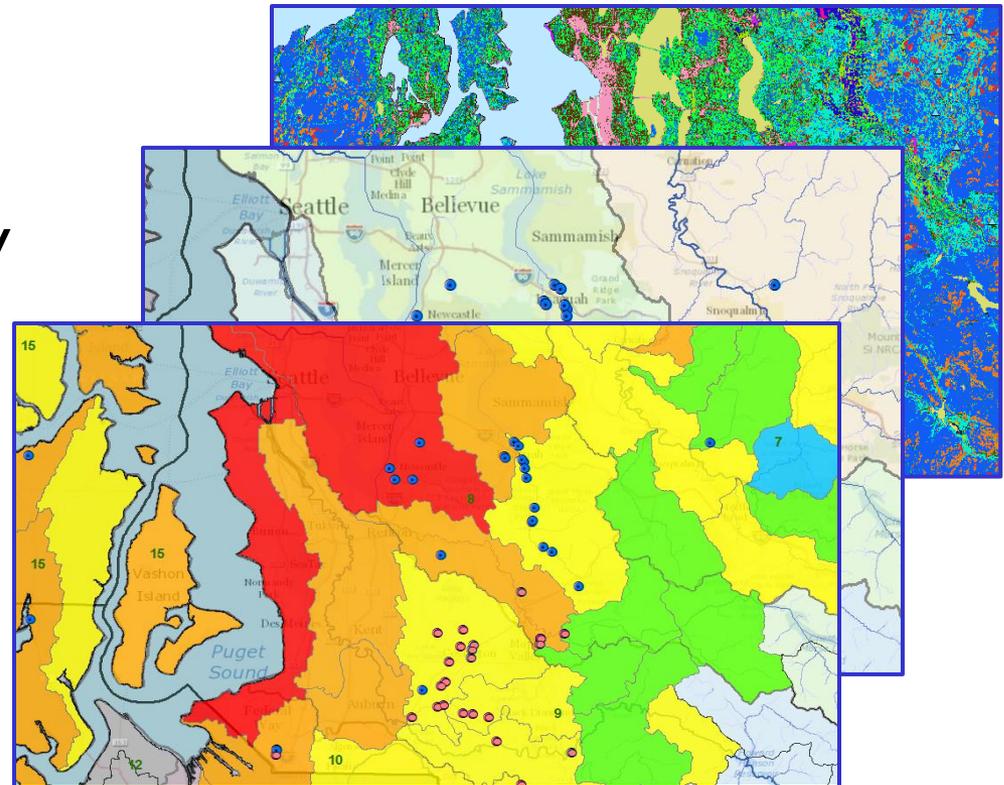
# Top 30 sites

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



# 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!**

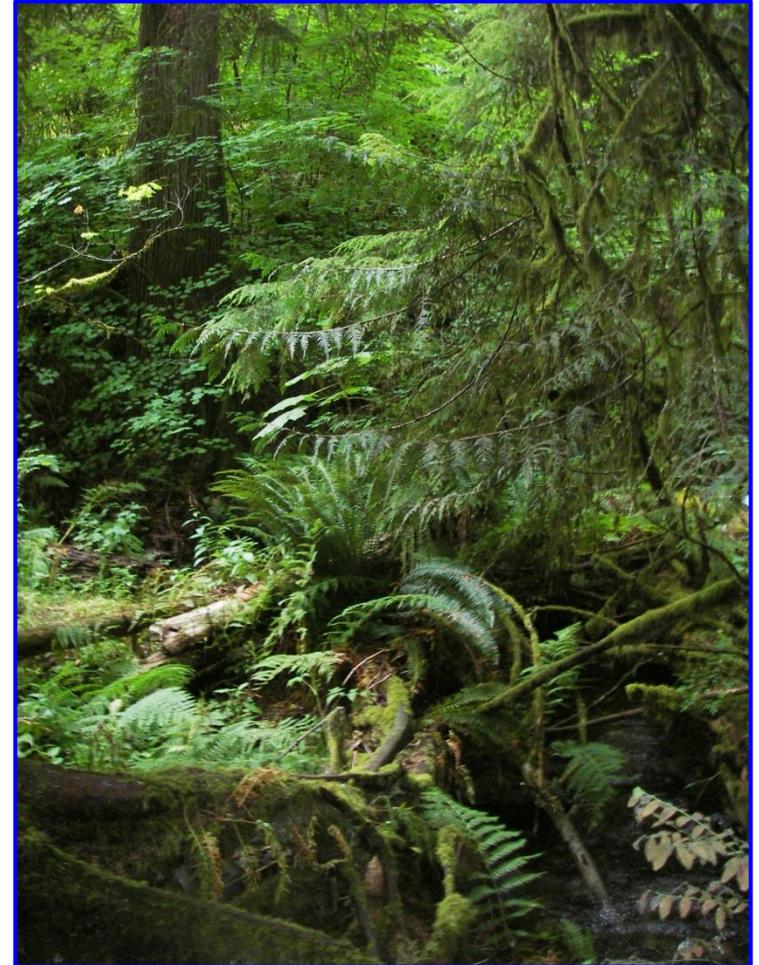
-  Habitat improvements
-  Riparian plantings
-  SW retrofits
-  Agriculture BMPs
-  Education/outreach
-  Seeding inverts...



# Next Steps: **Preservation**

## Strategies to preserve Excellent Sites

- Land Purchase
- Conservation easements
- Development rights



# Project Web Page:

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

## Puget Sound Stream Benthos

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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:**

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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**