



Apr 4th, 3:30 PM - 3:45 PM

## Taking stock of avian responses to Puget Sound estuary restoration: inventory and assessment

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Bayard, Trina; Koberstein, Marla; Slater, Gary; and Hass, Todd, "Taking stock of avian responses to Puget Sound estuary restoration: inventory and assessment" (2018). *Salish Sea Ecosystem Conference*. 66. <https://cedar.wwu.edu/ssec/2018ssec/allsessions/66>

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# Taking stock of avian responses to Puget Sound estuary restoration: inventory and assessment

(M. Koberstein, G. Slater, T. Bayard, T. Hass, 2017)

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Salish Sea Ecosystem Conference - April 4, 2018



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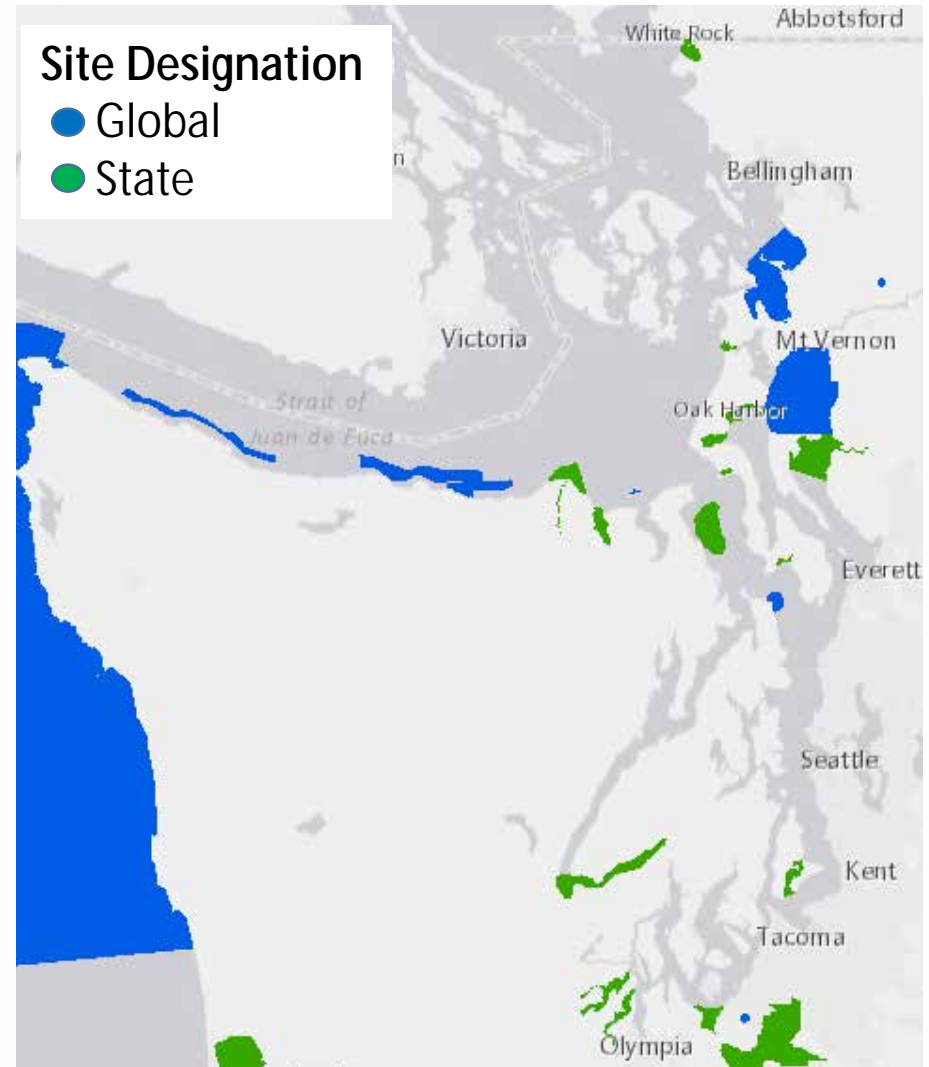
**Audubon**  
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Dunlin photo credit: David Gluckman

# Western Hemisphere Shorebird Reserve Network



# Important Bird Areas



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Hooded Merganser

Black-bellied Plover, Dunlin, Sanderling



Common Loon

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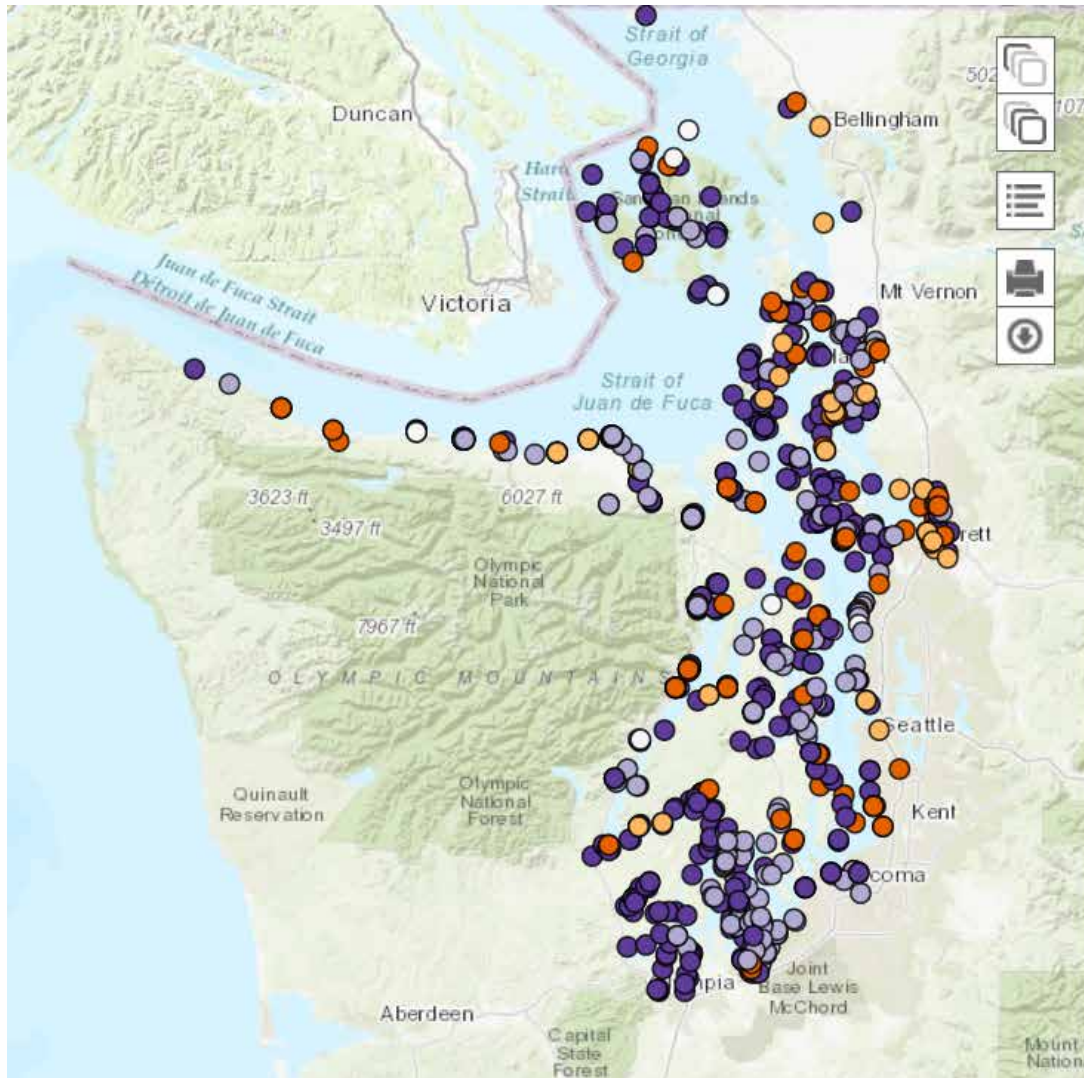


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# Restoration and Protection Projects



## Legend

### All Projects

- Active Projects
- Proposed Projects
- Dormant Projects
- Conceptual Projects
- Completed Projects

Map credit: Washington Dept. Fish and Wildlife Puget Sound Nearshore Project: [www.psnerp.ecosystem.us](http://www.psnerp.ecosystem.us)



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# 21 berm/dike removal restoration projects initiated 1994-2016

## 14 incorporate bird monitoring

### General Information

- Study site
- Objectives
- Surrounding landscape
- Crew type
- Other data collected
- Project funding

### Sampling Methodology

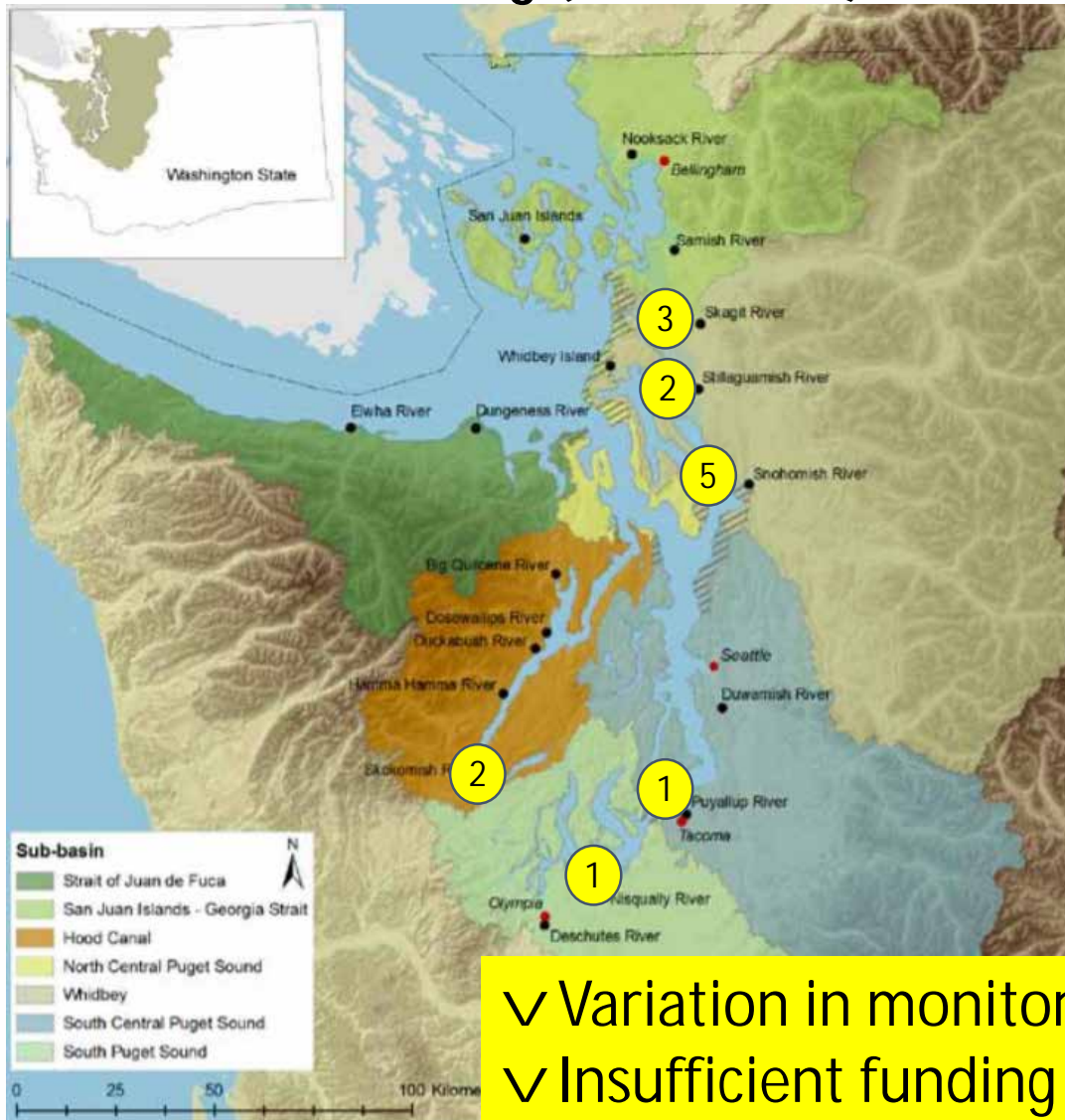
- Survey type
- Timing and frequency
- Duration
- Habitat sampled

### Analysis

- Taxa
- Metrics
- Analytical approach
- Monitoring results
- Recommendations



# Approximate location of 14 estuary restoration projects with bird monitoring (1994-2016)



- ✓ Variation in monitoring methods, objectives
- ✓ Insufficient funding limits scope of monitoring
- ✓ No clear picture of bird response to restoration



# \*Monitoring complete at 9 of 14 projects

General Information	
<ul style="list-style-type: none"><li>• Study site</li><li>• <b>Objectives</b></li></ul>	Establish baseline (3) Before/after effects (4) Post-restoration trends (7)
<ul style="list-style-type: none"><li>• Surrounding landscape</li><li>• Crew type</li><li>• Other data collected</li><li>• <b>Project funding</b></li></ul>	Fully funded (4) Moderately funded (4) Minimally funded (2)

Most common taxa analyzed were shorebirds (8 projects) and waterfowl (8 projects)



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Sampling Methodology
<ul style="list-style-type: none"> <li>• <b>Survey type</b></li> </ul>
<ul style="list-style-type: none"> <li>• Timing and frequency</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Duration</b></li> </ul>
<ul style="list-style-type: none"> <li>• Habitat sampled</li> </ul>

Point Counts: 4 (8)  
 Line Transects: 2 (7)  
 Area searches: 3 (6)

Average: 7 years  
 Range: 2-16 years

- \* 14 projects conducted spring sampling
- \* 8 projects surveyed at low and high tide
- \* Monitoring frequency was highly variable

## Analysis

- Taxa
- Metrics
- Analytical approach
- **Monitoring results**
- Recommendations

- Waterfowl increase
- Changes in community composition
- Decrease in overall abundance

\*Results are largely descriptive



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## Inventory and summarize

Inventory and summarize bird monitoring projects associated with estuarine restoration in Puget Sound, other regions of Pacific Flyway



## Workshop

Conduct a regional workshop to identify information needs and adaptation monitoring priorities



## Framework

Develop a scientific framework for a habitat-focused avian monitoring strategy that will inform adaptive management and restoration of estuaries.



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Questions? Contact Trina Bayard: [tbayard@audubon.org](mailto:tbayard@audubon.org)

Access the full report at:

<https://sites.google.com/a/psemp.org/psemp/birds-mammals>

(Under "2017 meetings and products")



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**We are grateful to the following contributors:**

Nathalie Hamel, Puget Sound Partnership

Isa Woo, USGS

Julian Wood, Point Blue Conservation Science

Molly Alves, Tulalip Tribes

Bethany Ackerman, Skokomish Tribe

Randi Shaw, The Nature Conservancy

CK Eidem, Ducks Unlimited



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