

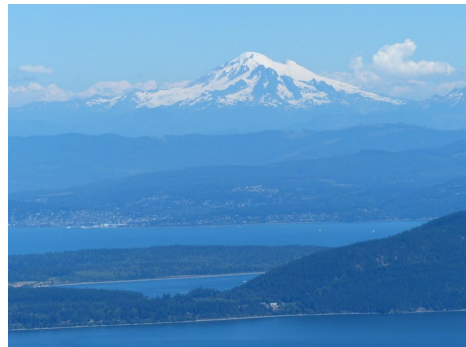
Integrating Human Wellbeing in Puget Sound Restoration

Dr. Kelly Biedenweg

Fisheries, Wildlife and Conservation Sciences Department
Oregon State University
2022



Storyline



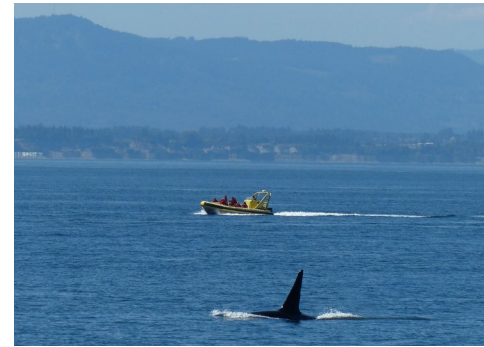
1) Background:
Geographic & Policy



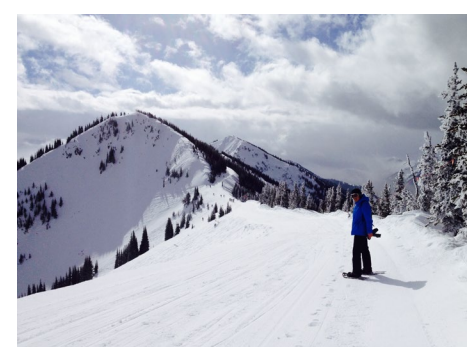
2) Laying the Groundwork :
Conceptual models and developing HWB indicators



3) Indicator Adoption Process:
Formal and informal



4) Monitoring Indicators
Surveys and Modeling



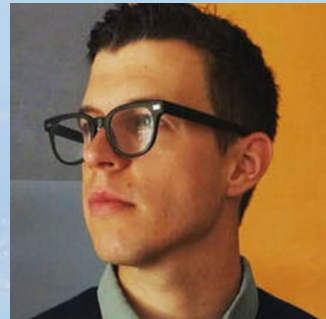
5) Planning for HWB
Local and Basin scales



Our Team (some of)



Me, PI



David Trimbach,
Research Associate



Whitney Fleming,
Graduate Research
Assistant

Kari Stiles, Adaptive
Management
Coordinator, Puget
Sound Partnership



Leah Kintner,
Ecosystem Recovery
Manager, Puget Sound
Partnership



Haley Harguth,
Watershed Program
Manager, Hood Canal
Coordinating Council



Trina Wellman,
Northern Economics,
Inc.

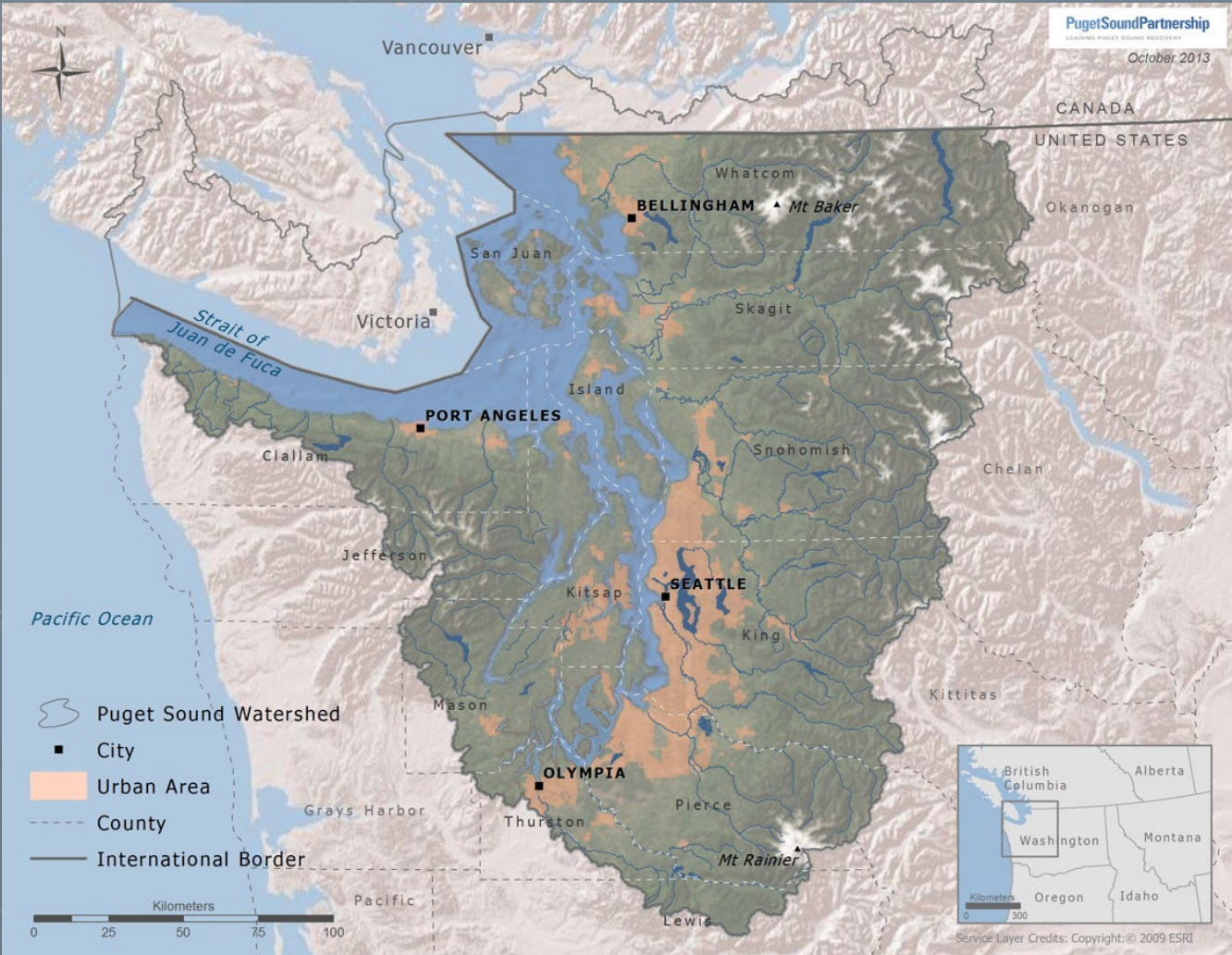


OSU TEAM

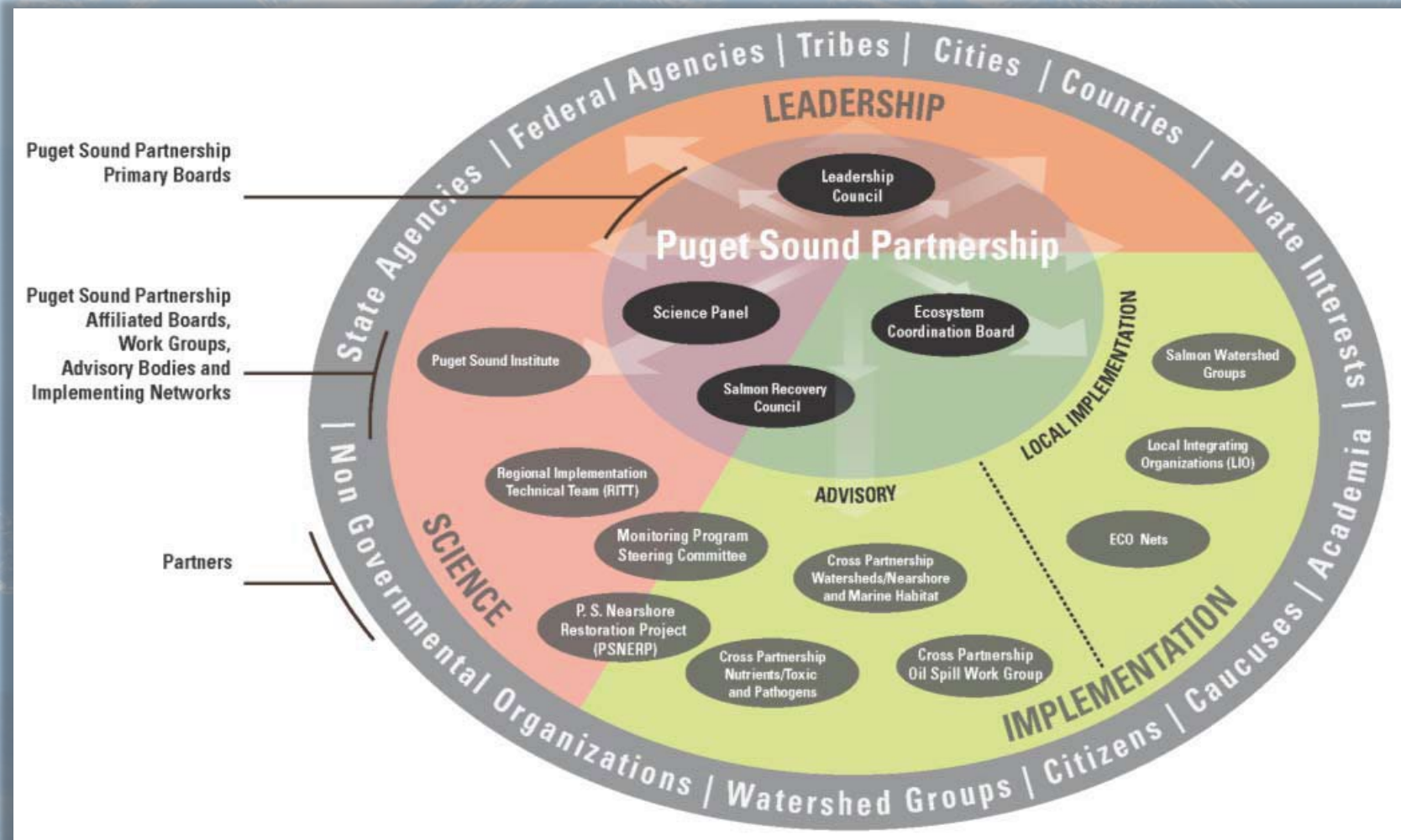
Partners



What is the Puget Sound?



Puget Sound Management Conference

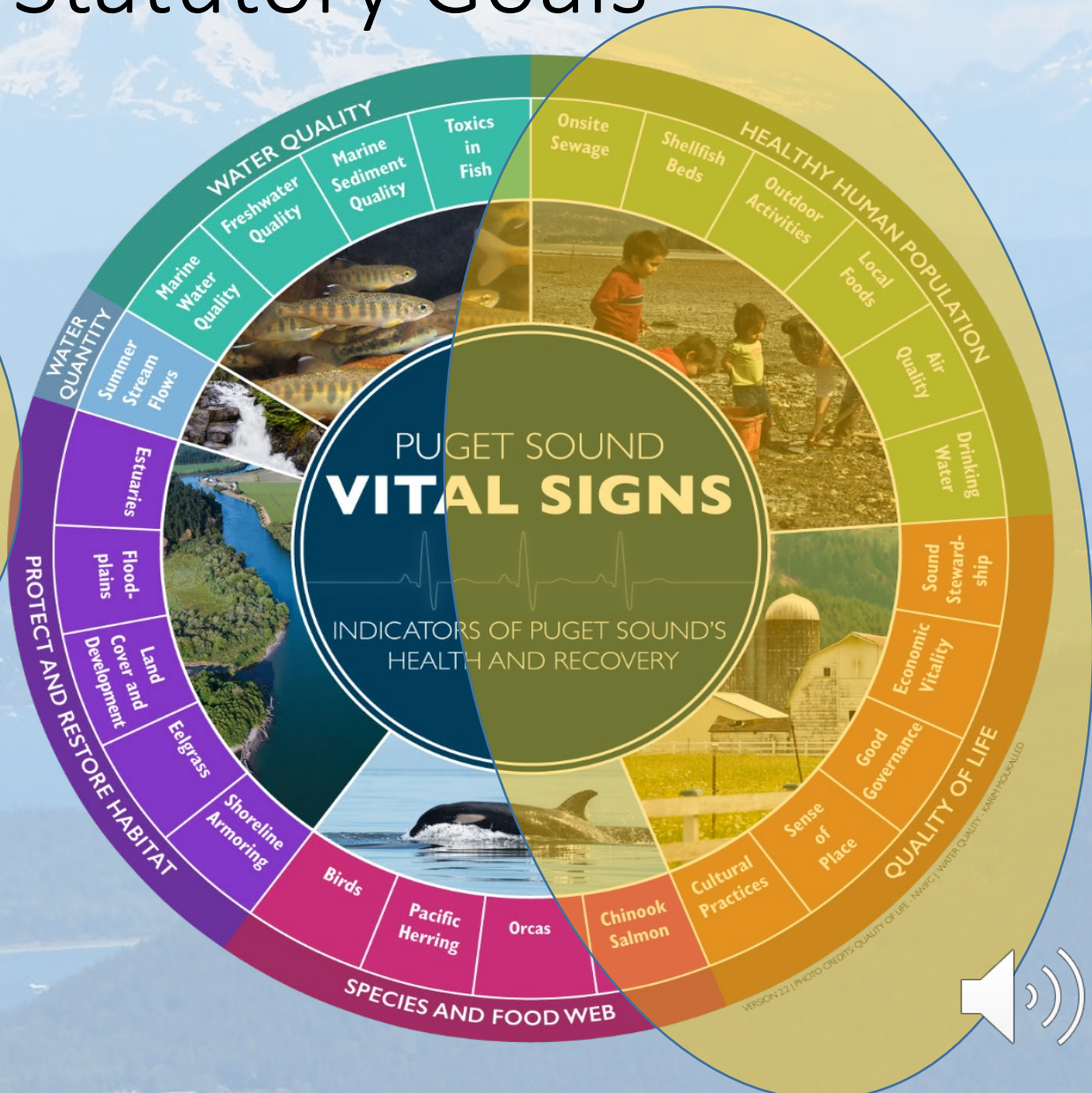


Puget Sound Partnership Statutory Goals

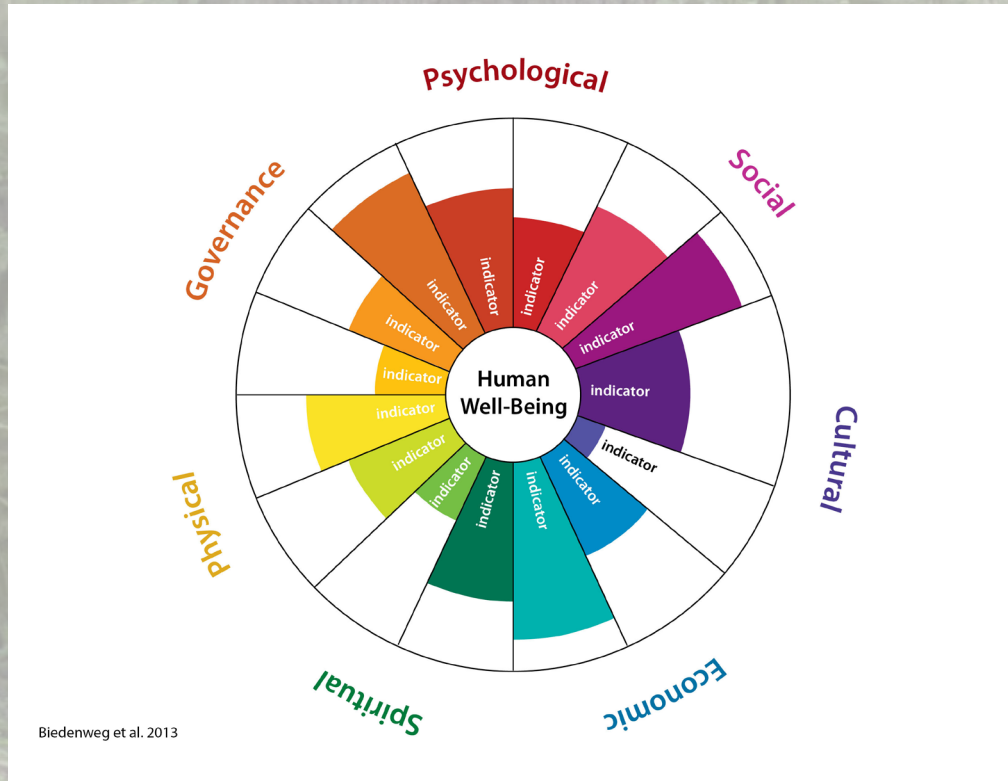
- ❖ Healthy people are supported by a healthy Puget Sound
- ❖ Our quality of life is sustained by a healthy Puget Sound
- ❖ Species and the web of life thrive
- ❖ Habitat is protected and restored
- ❖ Rivers and streams flow at levels that support people, fish, and wildlife
- ❖ Marine and fresh waters are clean.



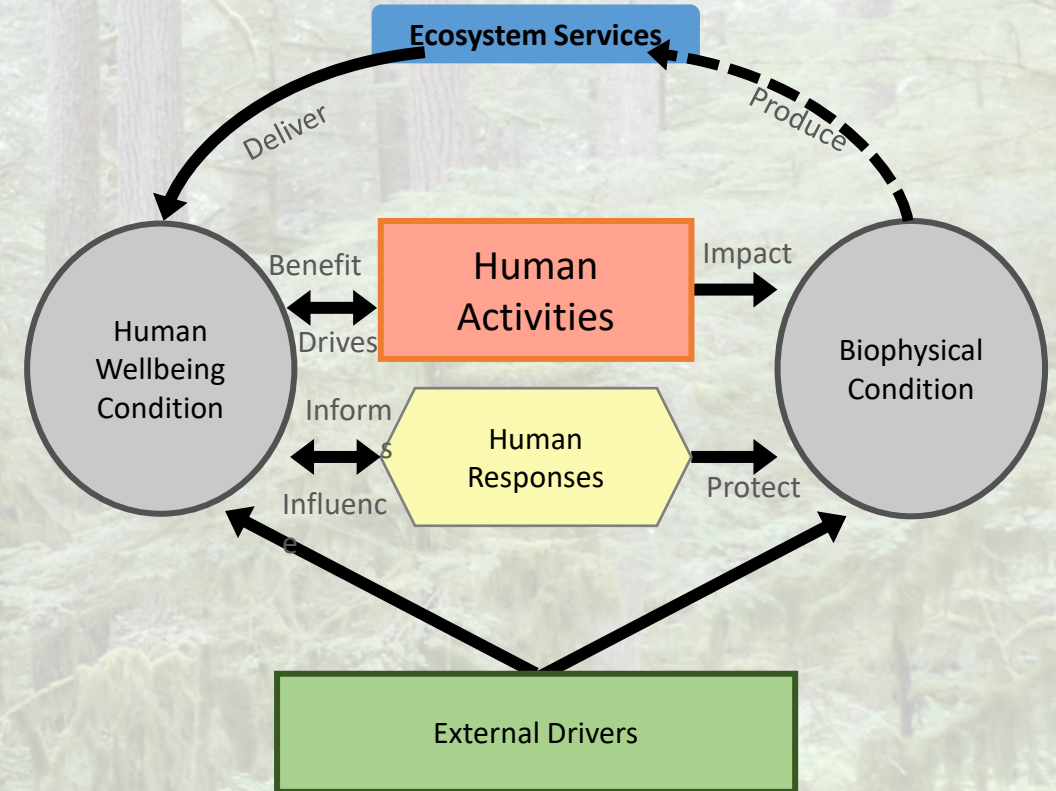
Puget Sound Partnership Statutory Goals



Laying the ground(sea)work



Biedenweg et al. 2016



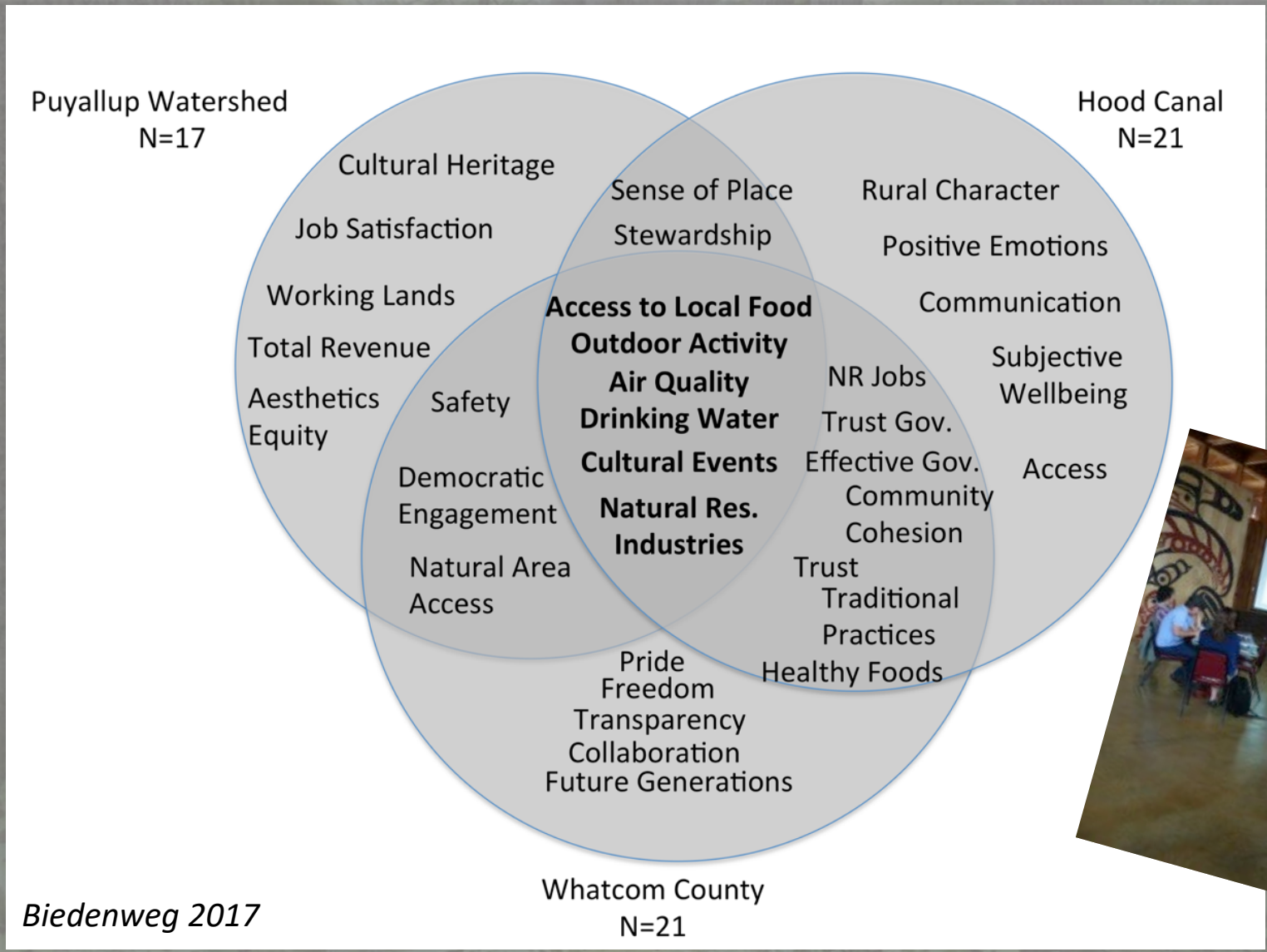
Harguth, H. et al. 2014



Developing Human Wellbeing Indicators



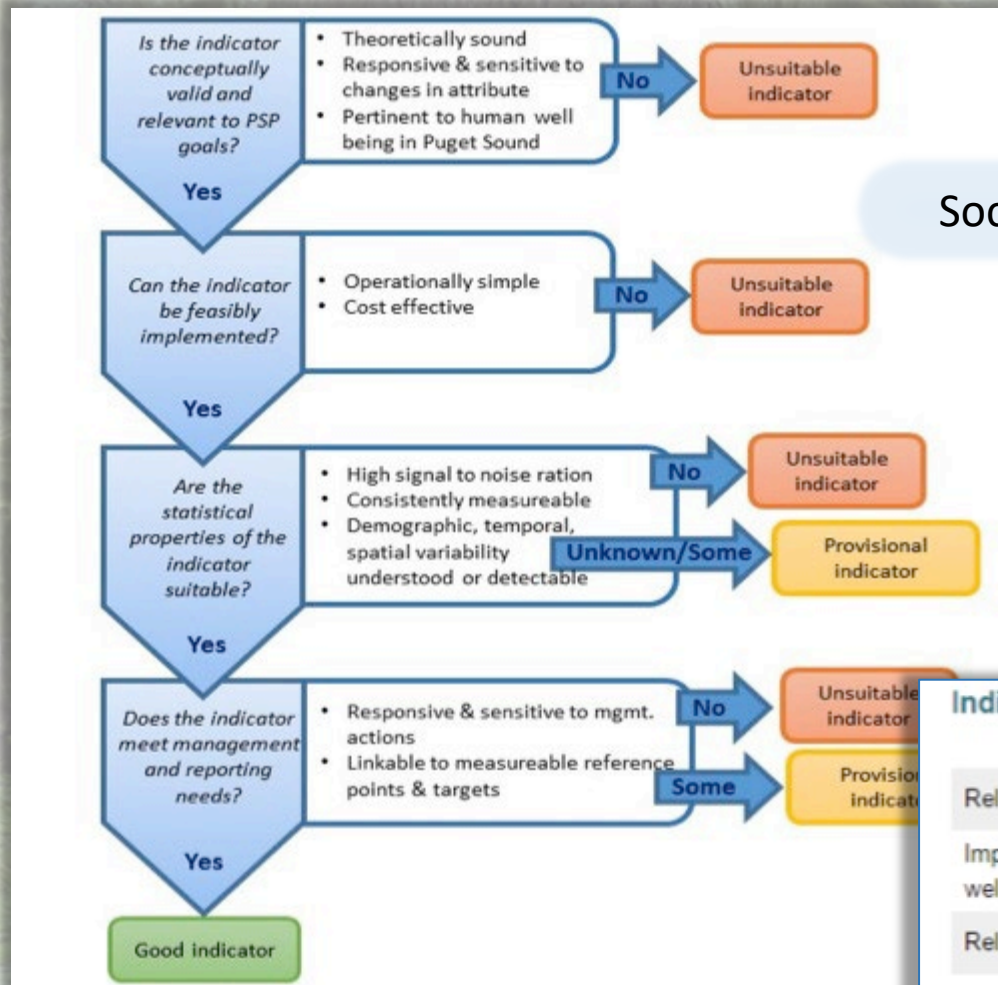
Biedenweg et al. 2014



Biedenweg 2017



Assessing Scientific and Policy-Relevance



Social Scientists

Policymakers

Indicator 1: Participation in Natural-Environment Inspired Cultural Activities

	Low	Medium	High	Very High
Relevance to Puget Sound	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Importance to representing human wellbeing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relevance to management concerns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication power	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progress assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Biedenweg et al. 2018

Laying the groundwork



Adopting HWB Indicators

Formal and Informal



Monitoring HWB

OSU-run Survey

Good Governance Perceptions

- Agreement that there's Trust, Opportunity to Influence, Freedom, Access to Information, Representation

Local Foods Harvest

- Frequency of Shellfish, fish, mushrooms/plants, waterfowl, deer/elk

Sense of Place

- Agreement that they have Pride of place, identity with place, attachment to place, uniqueness of place

Outdoor Recreation

- Frequency of participation in 12 categories

Outdoor Work

- Frequency of outdoor work

Cultural Practices

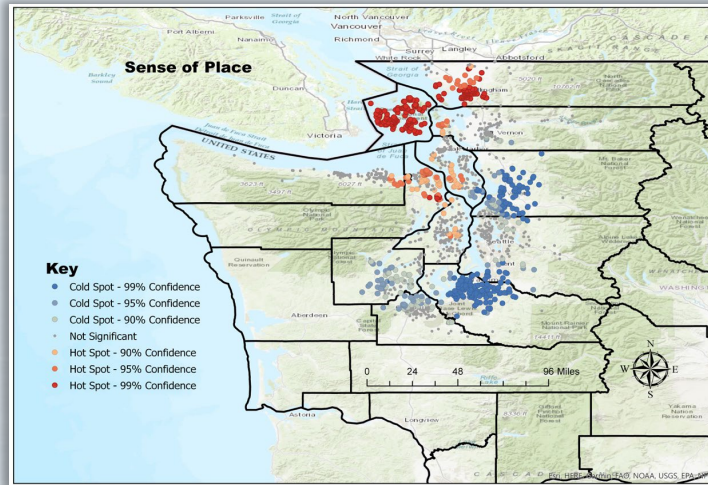
- Satisfaction with ability to engage in cultural practices related to environment

Psychological Wellbeing

- Frequency of experiencing inspiration and stress reduction in natural environments



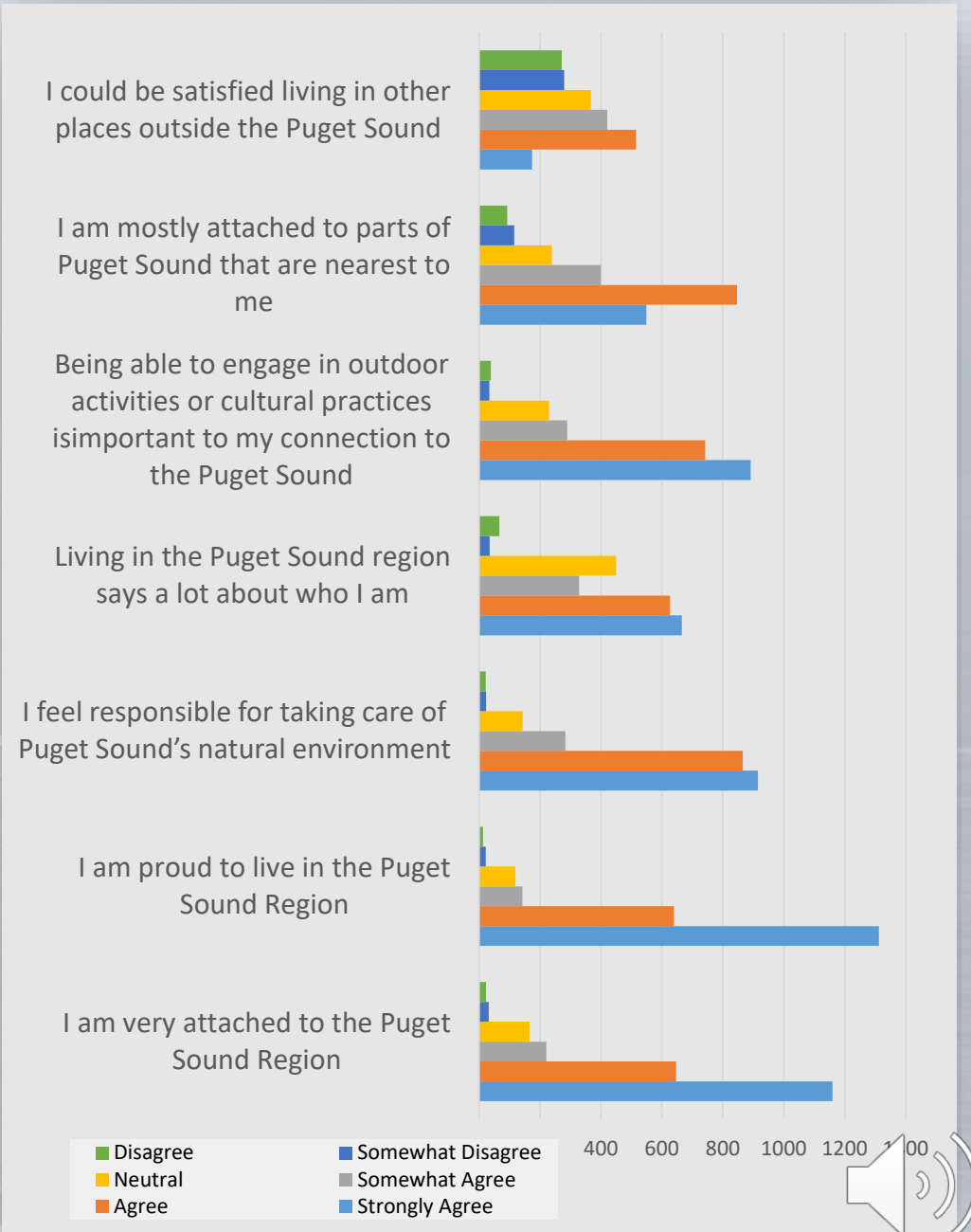
Monitoring HWB Products



Sense of Place (2018 data)

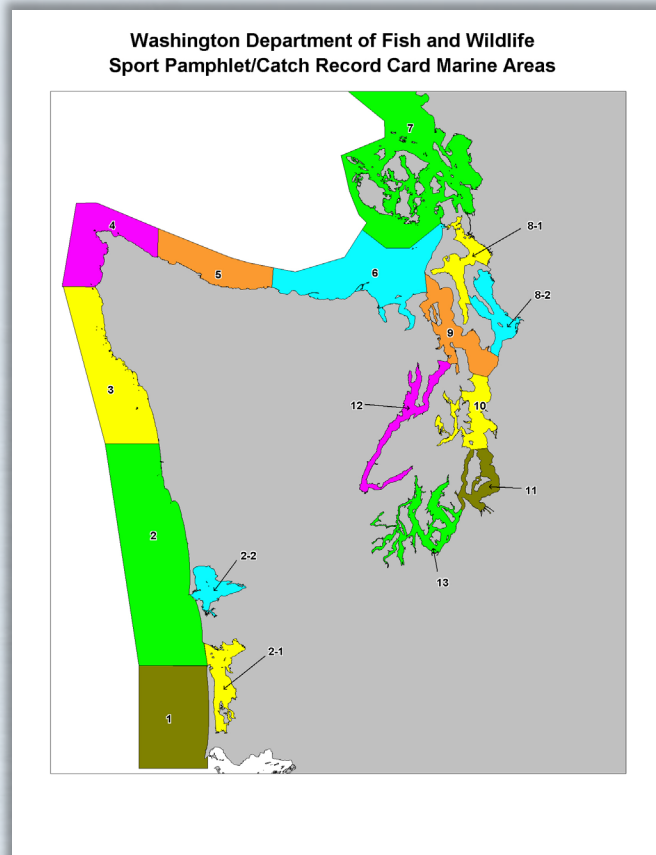
Mean: “somewhat agree”

Regression model r^2 : 0.044
(white, younger, more formal education, longer residence)

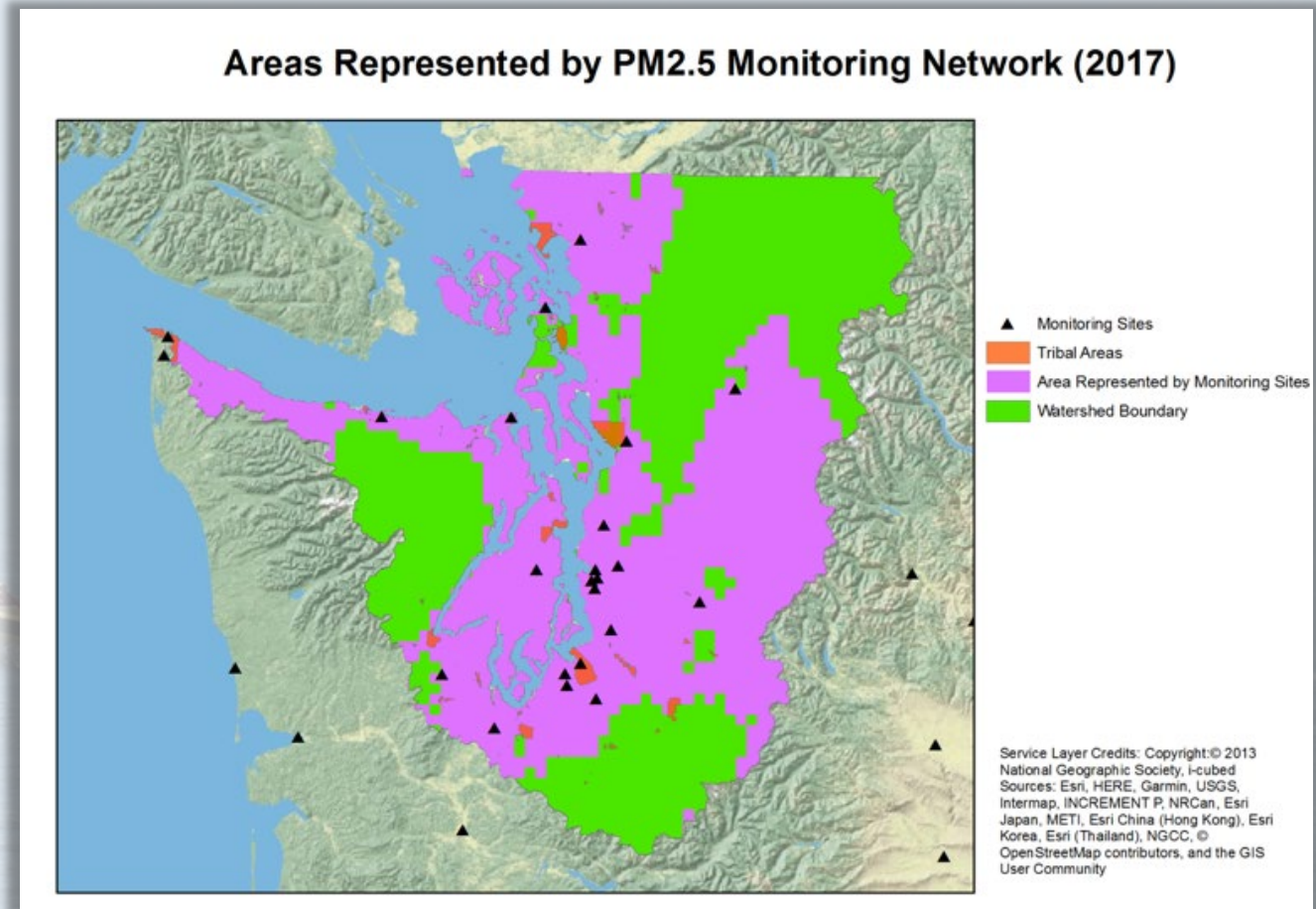


Monitoring HWB

Products by Partner Agencies



Recreational Dungeness Crab, WDFW

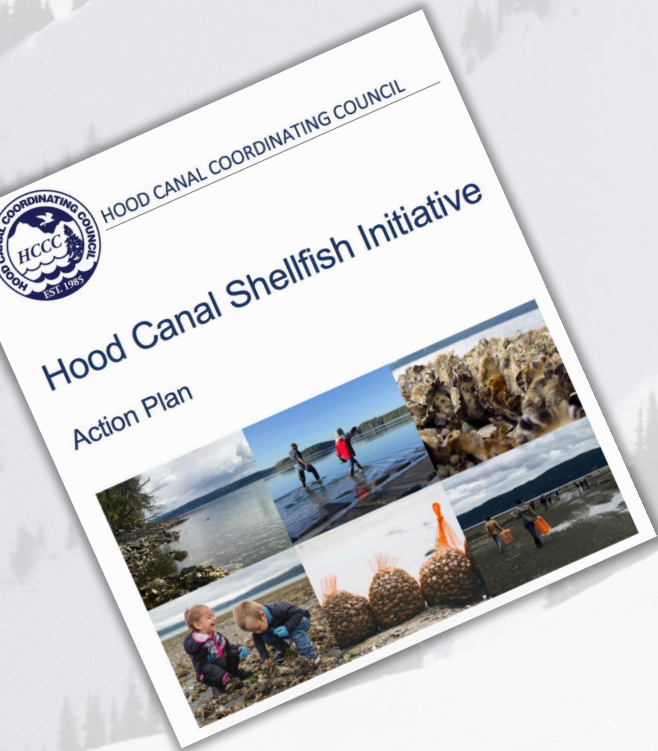


Air Quality, WADOH



Planning for HWB

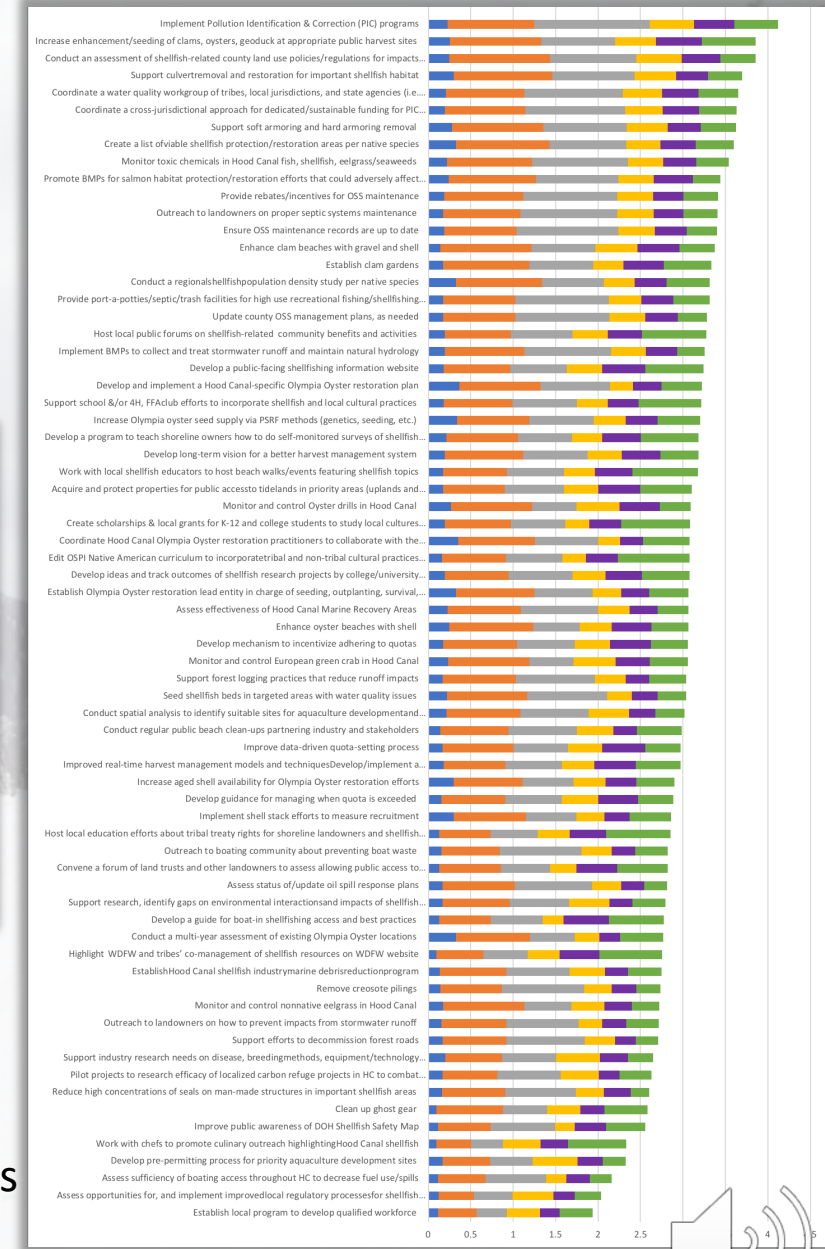
Local Scale



Shellfish Initiative Objectives

- Objective 1: Restore Native Olympia Oyster
- Objective 2: Enhance habitat
- Objective 3: Enhance Water Quality
- Objective 4: Support Sustainable shellfish economy
- Objective 5: Expand harvest opportunities
- Objective 6: Cultural Appreciation

Shellfish Initiative Rated Strategies



Planning for HWB

Basin Scale



ACTION AGENDA DESIRED RECOVERY OUTCOMES



5 Ensure human wellbeing

We cannot achieve Puget Sound recovery without considering and ensuring the health and wellbeing of human populations in Puget Sound.

Humans have complex, reciprocal relationships and interactions with the environment—ones that can contribute to both the decline or health of the Puget Sound ecosystem. A healthy ecosystem provides aesthetic values, opportunities for recreation, and access for the enjoyment of Puget Sound. Tribal cultures depend on the ability to exercise treaty rights to fish, gather plants, and hunt for subsistence, cultural, spiritual, ceremonial, and medicinal needs. Human well-being is also tied to economic prosperity. A healthy ecosystem supports thriving natural resource and marine industrial uses such as agriculture, aquaculture, fisheries, forestry, and tourism.

Puget Sound recovery efforts can also have positive, negative, neutral, or unknown effects on human communities, especially historically overburdened communities. The recovery community must consider these effects so that recovery contributes to ensuring thriving human communities and continues to advance environmental justice.

We must ensure human wellbeing, in a just, equitable, diverse, and inclusive manner, when protecting and recovering the Puget Sound ecosystem.

Outcomes listed here directly support the healthy human population and vibrant quality of life Vital Signs and indirectly support all other Vital Signs.

5. We must ensure human wellbeing, in a just, equitable, diverse, and inclusive manner, in protecting and recovering the Puget Sound ecosystem

5.1. Senses of place of Puget Sound residents are respected and enhanced

- 5.1.1 Opportunities for stress reduction and motivation from natural environments for diverse human communities are enhanced
- 5.1.2 Attachments among all residents to Puget Sound's environments (including natural, biocultural, and anthropogenic places) are acknowledged and respected and recognized as opportunities to achieve the Action Agenda

5.2. Engagement in and trust of Puget Sound environmental and natural resource governance is increased

- 5.2.1 Decision making is made more inclusive by participation of a broader set of committed stakeholders and diverse forms of knowledge early in ecosystem recovery processes
- 5.2.2 Capacity for overburdened communities to engage in environmental decision making is increased
- 5.2.3 Transparency in environmental and natural resource management decision making and the use of science is improved
- 5.2.4 Trust is increased by including and communicating directly and effectively with new and diverse audiences

5.3. Participation in environmentally related cultural practices and opportunities for harvesting of quality local foods are enhanced

- 5.3.1 Opportunities for cultural practices, such as native and spiritual practices and environmentally related social activities, are increased
- 5.3.2 Access to safe and more abundant local food harvests, such as fish, shellfish, and game, for human populations is increased

5.4. Employment and production in natural resources sectors such as fisheries, aquaculture, agriculture, timber, ecosystem restoration, and tourism are made resilient

- 5.4.1 Natural resources sector jobs and production opportunities are supported

- 5.4.2 Innovative techniques that promote a healthy natural environment and achieve growth in natural resources industries are encouraged

- 5.4.3 Restoration actions consider economic benefits and impacts, monitor tradeoffs, and choose multi-benefit solutions where possible

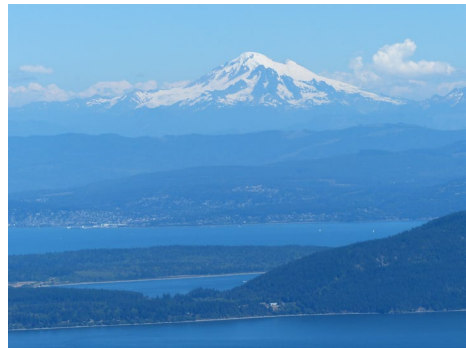
5.5. Participation in outdoor recreational and stewardship activities is enhanced

- 5.5.1 Opportunities for multiple uses of open space, waterways, and other natural environments are recognized and increased
- 5.5.2 Barriers that have resulted in exclusion of people from participating in outdoor recreation and stewardship activities are identified and removed
- 5.5.3 Meaningful and community-based stewardship behaviors are supported

5.6. The health of the human population of Puget Sound is not threatened by changes in ecosystem conditions and sensitive populations do not experience inequitable health outcomes

- 5.6.1 Levels and patterns of air pollution do not threaten Puget Sound communities or sensitive populations with adverse health outcomes
- 5.6.2 Levels and patterns of contaminants in drinking water do not threaten Puget Sound communities or vulnerable populations with adverse health outcomes
- 5.6.3 Levels and patterns of contamination in fish and shellfish harvested from Puget Sound waters do not threaten the health of Puget Sound communities or vulnerable populations
- 5.6.4 Levels and patterns of pollutants and biotoxins in surface waters do not threaten the health of Puget Sound communities or vulnerable populations

Storyline for today



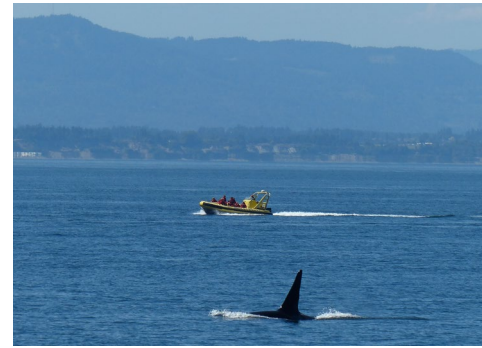
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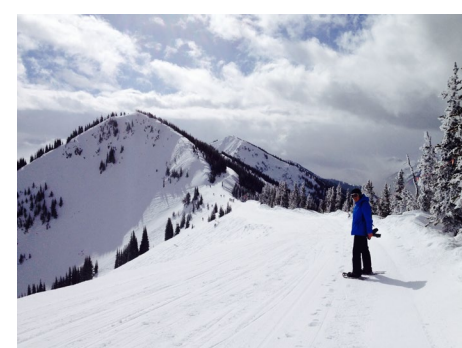
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Thank you!

All partners in agencies, communities, and academia

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- Puget Sound Implantation Strategy Science Awards (2017-2025)



Citations

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And many others: kellybiedenweg.weebly.com

