

PRIORITY 2:

Is the legal framework for ecosystem recovery working?

* = not local

- (1) Beaudreau, A. H. and Whitney, E. J. (2016). Historical patterns and drivers of spatial changes in recreational fishing activity in Puget Sound, Washington. *PLoS One*. 11(4). DOI: [10.1371/journal.pone.0152190](https://doi.org/10.1371/journal.pone.0152190)

In the article, Beaudreau and Whitney examine the behavioral and historical drivers behind temporal and spatial fishing patterns in the Puget Sound, including within marine protected areas. The authors suggest that primary drivers include decline in target fish species and change in residence, in addition to advances in fishing technology and boating gear, while fishing regulations and marine preserves hold the least influence. Since the 1950's, fishing locations have remained fairly constant, centralized near the west of San Juan Island and south of Whidbey Island, with spatial changes associated with decline in species. Despite the implementation of 25 marine protected areas, respondents stated they altered their behavior based on personal observations and local knowledge of species declines versus imposed regulations by the state. The authors' utilized a participatory GIS mapping system to document temporal and spatial changes in fishing patterns of 80 recreational fishers and analyzed it via kernel density estimation. This literature could prove important to priority two as it suggests links between the rate of compliance to fishing regulations and individual behavioral drives such as place-based knowledge.

- (2) Breslow, S. J. (2014). A complex tool for a complex problem: political ecology in the service of ecosystem recovery. *Coastal Management*. 42(4), 308-331. DOI: [10.1080/08920753.2014.923130](https://doi.org/10.1080/08920753.2014.923130)

In this article, Breslow details the case of the Skagit Valley within the Puget Sound, and the battle between farmers and environmental groups to restore local salmon runs. The author's purpose is to detail a case study on facilitating cooperation between stakeholders despite legal

and institutional constraints, mistrust, differing knowledge sources and conflicting senses of place, among other factors. Breslow explains that the conflict in part results from differing perspectives. While the farmers feel unjustly punished for converting habitat to farmlands, believing it is irrelevant to salmon population declines, tribal members feel they are being robbed of their right to fish on their traditional lands and that commercial fishing and habitat loss are the root causes of salmon decline. These conflicting perspectives have been compounded in governmental policies and cultural narratives, revealing sociocultural insights that can increase awareness and understanding into social and institutional barriers to ecosystem recovery efforts. Breslow conducted her research between 2001-2006, obtaining over two cumulative years of field work with tribal members and local farmers in the Skagit Valley, in addition to conducting over 150 interviews and review of primary literature and historical documents. This article is particularly relevant to priority two as it expressly describes institutional and social barriers to ecosystem recovery within the Puget Sound involving conflicting perspectives of Indigenous peoples, and stakeholders.

(3) Clauson, C. and Trautman, L. (2015). An Inventory of Policy Actors and Instruments Relevant to the Salish Sea. *Western Washington University*.

This report summarizes and categorizes all relevant policy actors and instruments (U.S., Canada, tribal, non-governmental) to the management and health of the Salish Sea ecosystems. The authors describe how policy actors interact at different levels to determine local policies and laws, requiring extensive collaboration and understanding among different actors, challenges which frequently result in fragmented governance. Clauson and Trautman make it clear that they do not evaluate the effectiveness of these policies, but instead list them for a baseline inventory and comparison of approaches. The database foundation arose from Christine Nasser's 1992 report, "Beyond the Border, Environmental Management in British Columbia and Washington State," and was updated by Clauson and Trautman to include updated or new legislation and other changes. One major limitation of this report is that it is fixed, only representing the policies in place in 2015, therefore further research is required to keep this list relevant with

current legislation. This literature proves relevant to priority two as it summarizes the current transboundary legal policies and laws in accordance with management of the Salish Sea.

- (4) Fraser, M. D., McWhinnie, L. H., Canessa, R. R. and Darimont, C. T. (2020). Compliance of small vessels to minimum distance regulations for humpback and killer whales in the Salish Sea. *Marine Policy*. 121.
<https://doi.org/10.1016/j.marpol.2020.104171>

The authors' purpose is to develop an understanding of demographic and spatial regulatory compliance variance regarding humpback and killer whales in the Salish Sea. Fraser et al. observed nearly 80% vessel compliance to minimum distance regulations but noted noncompliance occurred almost exclusively along coastal community waterways, and was primarily concentrated on orcas, with the majority of violators being recreational (versus commercial) boaters. The authors also note that an increase in whale watching outfits (both commercial and recreational) increase the potential for collision, noise pollution and disturbance/injury of whales. Fraser et al. suggest that commercial vessels compliance may be closely linked to maintaining a balance between upholding their business license (compliance to regulations) and obtaining tips and positive reviews from customers. Recreational boaters, alternatively, are likely more influenced by level of knowledge of regulations (61% of boating operators reported they were unaware of such regulations). The authors suggest increased presence of enforcement officers with focus on regions of higher non-compliance, increased recreational boater education requirements, and marketing adjustments for commercial whale watching ventures (viewing distances, behaviors, and whale species). Data was obtained over a two-year period consisting of over 404 hours on the water via a commercial boating vessel and were analyzed with nonparametric Kruskal-Wallis tests in RStudio. This article is relevant to priority two as it details the rate of compliance and potential drivers for compliance for minimum distance regulations in the Salish Sea. The authors also provide potential solutions to compliance issues.

- (5) Hanlon, E. M. (2013). *Perceptions of marine protected areas in Puget Sound* (Masters Dissertation). The Evergreen State College, Olympia.

Hanlon's purpose is to reveal patterns of resistance, support, or potential coalitions for marine protected areas (MPAs) among resource users and managers in the Puget Sound to inform decision-makers of local perspectives. Among the 127 MPAs in Washington state managed across 10 different agencies, Hanlon argues there is a lack of coordination and consistency with no evident plan for future monitoring and management, with only 20% providing medium-high protection for all species and ecological processes. While the majority (77.2%) of survey respondents agreed that the MPA definition aligned with its objectives and goals, over 62% cited there were not enough MPAs implemented in Puget Sound, and over half agreeing that fishing and gear restrictions in MPAs were too permissive. Over 70% of respondents agreed that coordination across management agencies is necessary for clear and consistent MPAs, and over 80% suggested for consistent monitoring to ensure success of MPA implementation. Hanlon utilized informal interviews and surveys across Puget Sound resource stakeholders, using both quantitative and qualitative analysis to reveal patterns of social responses. This literature proves relevant to priority two as it provides stakeholder input on the effectiveness of current institutional designs, as well as potential barriers to facilitating desirable ecological outcomes.

- (6) Hoelting, K. R., Hard, C. H., Christie, P. and Pollnac, R. B. (2013). Factors affecting support for Puget Sound marine protected areas. *Fisheries Research*. 144, 48-59.
<https://doi.org/10.1016/j.fishres.2012.10.006>

This article examines the potential for increased compliance of Marine Protected Areas (MPAs) with increased collaboration between the public and management agencies. Hoelting et al. suggest that increased awareness of local demographics, perceptions, and beliefs in ecological states as well as increased transparency will aid in improved support for and improved enforcement of legal mandates. The authors elaborate that commercial and recreational fishers are commonly the strongest opponents of MPAs likely due their direct economical or recreational relationship with natural resources, expressing a lack of objective goals and tangible effects, suggesting that they lack the understanding of long-term benefits. The three primary

variables that accounted for reported variance in MPA support included (1) inclusion of adequate information in the decision-making progress, (2) perception of regulations as fair, and (3) fair representation of all viewpoints in decision-making. Hoelting et al. gathered data from structured in-person surveys and analyzed for variance via the non-parametric Kruskal–Wallace test and stepwise (forward) regression analysis. This article proves relevant to priority two as it elaborates on institutional and social barriers for policy support and compliance.

(7) Safford, T. G., Norman, K. C., Henly, M., Mills, K. E. and Levin, P. S. (2014).

Environmental awareness and public support for protecting and restoring Puget Sound. *Environmental Management*. 53(4), 757-768. DOI 10.1007/s00267-014-0236-8

In this article, Safford et al. explore the connection between social factors, such as perceptions of local environmental problems, and support for environmental policies. The authors' intent was to ascertain what level of influence environmental awareness has on public support, and to reinforce the need for social indicators and public perceptions when developing and implementing public policy. Safford et al. found that Puget Sound residents feel knowledgeable about their local environment but display limited awareness of the intensity of specific environmental concerns such as pollution and salmon declines. Additionally, the general public may be unclear about the connections between these concerns and effective measures to mitigate them, such as the correlation of green business practices and salmon habitat improvement. Over two-thirds of Puget Sound residents are in support of NOAA management options despite a significant number of residents being under the belief that current environmental policies have had either negative or nonexistent effects for their community. Safford et al. conducted this investigation by analyzing a NOAA survey of 1,980 residents across the Puget Sound Basin with diverse demographics and employing multivariate logistic regression. The authors cite that the data source includes information limitations which makes determining potential driving factors (such as personal values and access to information) could influence individual beliefs on environmental problems. Despite these limitations, this article is particularly beneficial to policy two by evaluating the public's response to environmental policy and the reasoning behind their

support (or lack thereof), with particular attention to how different demographics and levels of environmental awareness influence them.

- (8) Sayles, J. S. and Baggio, J. A. (2017). Who collaborates and why: assessment of diagnostic governance network integration for salmon restoration in Puget Sound, USA. *Journal of Environmental Management*. 186(1), 64-78.
<https://doi.org/10.1016/j.jenvman.2016.09.085>

This article examines the problem of government silos in environmental planning settings, specifically salmon restoration in Whidbey Basin, Puget Sound, and the use of governance networks to overcome collaboration issues. Sayles and Baggio conclude that Puget Sound's governance structure is reasonably integrated with collaboration between state and federal organizations, tribal organizations, public utilities, land trusts, citizen groups and other stakeholders, but still exhibits gaps in communication. Most notably, there is a lack of collaboration between educational and state organizations, as well as between cities/towns and businesses. The authors explain that collaboration based on mutual interest and funding appear to be much more productive than those based on government mandates. Likewise, network connections should be made based on needs and capacities. In the case of Whidbey Basin, implementing a basin-wide recovery plan by the state led to standstill when local organizations would not support the effort, suggesting that decisions should be made on smaller scales for more effective implementation. The authors developed their findings by utilizing a combination of social network analysis and qualitative interview analysis, interviewing and surveying restoration practitioners. Limitations include lack of relevant spatial arrangements in participation scores. This article proves useful to priority two as it details institutional designs and barriers to implementing environmental policies and mandates.

- (9) Wilson, W. (2020). Governing the Salish Sea. *Hastings Environmental Law Journal*. 26(1), 168-182.

In this article, Wilson examines the management of Puget Sound's shared resources across the political boundaries of the Strait of Juan de Fuca between the U.S., Indigenous tribes and Nations, and Canada. In this paper, Wilson details the current governance structure and suggestions for potential improvement. The 1992 enactment of the Environmental Cooperation Council marks the beginning of joint action between Washington State and British Columbia in management of the Puget Sound, giving consideration to cultural and ecological systems, including the involvement of stakeholders and Nations in decision-making, that were long overlooked for political power over resources. In recent years, local Indigenous tribes and Nations have also begun to reclaim social, economic, and political power over environmental issues affecting their historic lands through their annual Council gatherings, amplifying their voices in resource management decisions. This literature is useful for priority two as it details the existing governance structure of the Puget Sound across political borders.