Embracing Two-Eyed Seeing in Fisheries Management

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The Western scientific method is tried, tested and true. It has helped us to better understand natural phenomena, predict chemical reactions, and has given us such mind melting theories as the theory of quantum mechanics, germ theory, and the general theory of relativity, to name a few. However, Western science has created a hierarchy of knowledge systems with itself at the top, and the view from the top can become distorted and narrow. With this hierarchical, command and control, and paternalistic mode of operation (Denny & Fanning 2016) Western science has its limitations. The Department of Fisheries and Oceans (DFO) manages all fisheries across Canada and is an example of failures and shortcomings within the Western science approach. They have stumbled more than once during their time as managers. Fishery stocks in Canada are suffering, salmon populations are decreasing, the Atlantic whitefish is essentially non-existent, oolichan runs are happening less and less frequently. (Justice Laws, 2021). Western science cannot alone provide us with the answers to resuscitate fish populations in Canada. Two-Eyed seeing is a framework that was conceptualized by Elder Albert Marshall, though he is adamant that he did not dream it up, rather it was passed down over millennia in Mi'kmaq culture. The concept of Two-Eyed Seeing is,

> "...*learning to see from one eye with the strengths of indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing… and learning to use both these eyes together for the benefit of all. Two-eyed seeing is interdisciplinary, cross-cultural, and pluralistic.*" (Denny & Fanning, 2016, p.16)

The crux of Two-Eyed Seeing is that both parties must respect the others pedagogy and ways of knowing, and enact a way forward upholding both perspectives in a plural

co-existence. Pluralism, in this case, means the acknowledgement of multiple realities and understandings around traditional knowledge and science and their relationship to fisheries management. (Denny & Fanning, 2016). Using only Western scientific methods, DFO has not been able to successfully manage fish health and abundance. A pairing with indigenous knowledge using the Two-Eyed Seeing framework would provide a deeper understanding of aquatic environments and how to engage with them for the benefit of not only humans, but fish as well. It is the idea of using indigenous knowledge that has withstood the test of time with Western scientific knowledge that has revealed so much of the world to us (Reid et al, 2021).

When European colonists first came to the so-called “New World” the treaties made were ones of shared respect. They were founded on the knowledge that each culture would benefit from each other’s strengths, and neither culture would subsume the other. This relationship quickly eroded as the colonists, now settlers, started taking more land without following the agreed upon protocols. Indigenous peoples’ numbers were significantly lower than prior to contact due to new diseases that they had not built immunity to (McMillan & Prosper, 2016). The small population size decreased their ability to protect their lands and their people. As settlers spread across the country, Canada was born. The Canadian Government continued to abuse the relationship with indigenous peoples of the land. They did so through assimilatory tactics of separation of culture, language, and community and attempting to subvert indigenous ways of knowing by instilling euro-christian ways of knowing (McMillan & Prosper, 2016). This created a paternalistic relationship, where one culture viewed themselves as superior to

the other, in this case Canadian culture is better than Indigenous culture. Indigenous knowledge systems have been minimized and ignored due to systemic discrimination, policies of assimilation and racism. This "*pervasive systemic discrimination devalues Indigenous knowledge and favors assimilation over recognition*." (McMillan & Prosper 2016, p.639). Western Science has played a part in devaluing indigenous knowledge systems. Western scientific ideals are so ingrained into our scientific psyche that often we do not acknowledge their weak points.

Western science can draw inferences from multiple data sources and methods and views data collection as a way to advance knowledge. (Abu, Reed & Jardine 2020). "...*the hierarchical concept of sequentially moving data to information to knowledge to wisdom can be found both explicitly and implicitly in Western knowledge systems.*" (Denny & Fanning, 2016, p.4). DFO uses a Western scientific framework to develop policies and make fisheries management decisions. Comparatively, indigenous knowledge is widely accepted as,

> "...*a cumulative body of knowledge, practice and belief evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.*" (Reid et al, 2021 p.245)

There are epistemological differences between how DFO and Indigenous nations manage fisheries. Conventional fisheries were *"originally developed in the service of single-stock, large-scale and commodity-oriented fisheries in North temperate parts of*

the world". (Reid et al, 2021, p.244). This is in contrast to the small-scale subsistence fishing of many indigenous nations.

Indigenous knowledge systems have evolved from "*generations of naturalist observations and insights through ways of living on the land*" (Michie, Hogue & Rioux, 2018, p). Laws around mutual respect for the lands, waters, plants and animals are prevalent in many indigenous knowledge systems. In Mi'kmaq culture the term Netukulimk can roughly be translated to sustainability. It is more than sustainability though, it is a guiding principle that Mi'kmaq fishers use to catch fish without harming them, and continuing to treat each fish with respect throughout the entirety of the relationship—capture, process, eat (Denny & Fanning, 2016). In Dzawada̲'enu̲xw culture the word Maya'antł can be boiled down to the word respect, but again it is more than that. It is a respect that transcends Western ideals of conservation and sustainability and moves into the realm of reciprocity. This fundamental law of reciprocity is at the core of both the Mi'kmaq and Dzawada̲'enu̲xw nations. It is a law of relationships. As Denny & Fanning, 2016 said:

> "*Traditional knowledge is not only information about species or habitats. It is the collective knowledge derived by a lifetime of observing and interacting within the natural environment. It is more than knowing about nature: It is about knowing how to interact with nature to ensure co-existence and survival for humans and animals.*" (p.9)

Indigenous knowledge has its limitations as well. It can explain through qualitative observations that fish populations are declining, but it cannot always explain why it is happening. This is Western science's wheelhouse.

Western science continues to provide important and valuable insight into fisheries management. Through instrumental observations, Western Science is able to pinpoint drivers of change (Reid et al 2021). Using Two-Eyed Seeing is not throwing the baby out with the bathwater, it is a comprehensive framework that is informed by Western science alongside indigenous knowledge. Reid's 2021 study found:

> "*the inclusion of Indigenous knowledge systems in fisheries research and management has been shown to: offer technological shifts that improve fisheries selectivity and sustainability, enhance early warning systems for sea state forecasting, reverse declines in the abundance and size of exploited species, yield otherwise inaccessible ecological insights such as missing baseline information, and play a critical role in the improvement and the collective adherence to fisheries policy.*" (p.253)

The pairing of Western science and Indigenous knowledge under a Two-Eyed Seeing framework uplifts the strengths of both sides acknowledges the complexities of natural systems. Embracing a Two-Eyed Seeing approach to fisheries management would equip decision-makers with a more well-rounded perspective.

Settlers could immediately see the importance of fish when they arrived in Canada. To protect them they enacted the Fisheries Act in 1868, which created the Department of

Fisheries and Oceans (DFO). Immediately there were differences in how Indigenous peoples managed fisheries compared to DFO. This is evident in the idea of conservation. Although both DFO and Mi'kmaq are conservationists, the way in which this is achieved is different. If a fish is noticed to be in decline, Mi'kmaq fishers will stop fishing for that species until the population has rebounded. This differs from DFO conservation methods of catch and release (Denny & Fanning, 2016). Indigenous fisheries, though focused on the economic, political and spiritual well-being of the larger community, ultimately values the fish over the human (Denny & Fanning, 2016), whereas DFO has prioritized economic benefits for humans. This is seen in DFO's support of Atlantic Fish Farms on the West Coast of British Columbia. The fish farms are located in the migratory pathway of Pacific salmon. Their presence has been linked to increased mortality of Pacific salmon, due to sea lice and disease (Krkošek et al., 2010). The harming of Pacific salmon is in direct violation of conservation protocols according to both Western science and indigenous knowledge. Indigenous nations of the area have been fighting against marine-based fish farms for over thirty years, in hopes that without fish farms impeding the migratory route of the Pacific salmon, their populations would rebound. Had DFO appropriately consulted, engaged with and worked alongside indigenous nations; and incorporated the Two-Eyed Seeing framework in their decision making, marine fish farms would not have been allowed to operate along the BC Coast. The knowledge set of Indigenous people is often referred to as Traditional Ecological Knowledge (TEK). TEK has been used in Western scientific studies, but it is often removed from its original context and made to fit within DFO criteria, who then applied it to other settings. The Two-Eyed Seeing framework puts

both knowledge systems on an equal setting where mutual respect furthers understanding of fisheries management.

The Two-Eyed Seeing framework will not be the solution to all our fishery management problems, nor will it fix settler-indigenous relations. In fact, Two-Eyed Seeing can be seen as a way of avoiding solving conflicts between indigenous and Western worldviews. One of the main tenets of Two-Eyed Seeing is that it avoids clashes of knowledge systems, but as Broadhead & Howard's 2021 study finds "*conflict avoidance, isn't conflict resolution… this aversion to controversy—the reckoning that reconciliation sometimes requires—has compromised the integrity of the concept itself, reducing Two-Eyed Seeing to a shadow of its potential self.*" (p.112). Indigenous and settler relations are tenuous and marred by a painful history. This adds a layer of complexity to using the Two-Eyed Seeing framework. With this in mind it is important to note that the Two-Eyed Seeing approach is not appropriate for every situation. For example, the return to self-governance in Indigenous nations would need to be paired with an understanding that these Nations can manage their fisheries without federal oversight (Reid et al, 2021).

Indigenous knowledge and Western science have the ability to create fisheries that are place-based, informed by local and historical knowledge, appropriately monitored, and based on decisions that benefit both the human and the fish.

> "*There are certainly distinctions in attributes that lead to both having individual strengths in specific contexts, but there is no righteous hierarchy of knowledge*

systems where one is systematically better or consistently outperforms another."

(Reid et al 2021, p.245)

Two-eyed seeing provides a respectful way forward that can bridge the gap between indigenous and Western worldviews that does not eradicate either way of life but instead creates a pathway for plural co-existence.

References

Abu, R., Reed, M. G., & Jardine, T. D. (2020). Using two-eyed seeing to bridge Western science and Indigenous knowledge systems and understand long-term change in the Saskatchewan River Delta, Canada. *International Journal of Water Resources Development*, *36*(5), 757–776. https://doi.org/10.1080/07900627.2018.1558050

Broadhead, L.-A., & Howard, S. (2021). Confronting the contradictions between Western and Indigenous science: a critical perspective on Two-Eyed Seeing. *AlterNative: An International Journal of Indigenous Peoples*, *17*(1), 111–119. https://doi.org/10.1177/1177180121996326

Justice Laws (2021). List of Wildlife Species at Risk. Government of Canada [ONLINE] https://laws.justice.gc.ca/eng/acts/S-15.3/page-17.html#h-39

Krkošek Martin, Bateman Andrew, Proboszcz Stan, & Orr Craig. (2010). Dynamics of outbreak and control of salmon lice on two salmon farms in the Broughton Archipelago, British Columbia. *Aquaculture Environment Interactions*, *1*(2), 137–146.

McMillan, L., & Prosper, K. (2016). Remobilizing netukulimk: indigenous cultural and spiritual connections with resource stewardship and fisheries management in Atlantic Canada. *Reviews in Fish Biology & Fisheries*, *26*(4), 629–647. https://doi.org/10.1007/s11160-016-9433-2

Michie, M., Hogue, M., & Rioux, J. (2018). The Application of Both-Ways and Two-Eyed Seeing Pedagogy: Reflections on Engaging and Teaching Science to Post-Secondary Indigenous Students. *Research in Science Education*, *48*(6), 1205–1220. http://dx.doi.org/10.1007/s11165-018-9775-y

Shelley K. Denny, & Lucia M. Fanning. (2016). A Mi'kmaw Perspective on Advancing Salmon Governance in Nova Scotia, Canada: Setting the Stage for Collaborative Co-Existence. *International Indigenous Policy Journal*, *7*(3). https://doi.org/10.18584/iipj.2016.7.3.4

Reid, A. J., Eckert, L. E., Lane, J., Young, N., Hinch, S. G., Darimont, C. T., Cooke, S. J., Ban, N. C., & Marshall, A. (2021). "Two-Eyed Seeing": An Indigenous framework to transform fisheries research and management. *Fish & Fisheries*, *22*(2), 243–261.