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Indigenous knowledge as a remedy for shifting baseline syndrome

Soga and Gaston (2018) recently outlined the features of shifting baseline syndrome (SBS; Pauly 1995), a condition whereby each new generation inherits an environment that has worsened from the generation before, producing lowered expectations for conservation and restoration. They showed some of the self-reinforcing elements of SBS and provided four recommendations to help counter it: (1) *restore the natural environment*, (2) *monitor and collect data*, (3) *reduce the extinction of experience*, and (4) *educate the public*. I commend the authors for clearly articulating this syndrome and offering potential paths forward to correct it. Across a spectrum of environmental domains, SBS is pervasive, and many of its most pressing challenges are concentrated in remote sections of the Tropics and the Arctic, regions that to outsiders may appear relatively untouched by human activities. Here I argue that Indigenous knowledge (IK) has a strong role to play in limiting the shifting of baselines, especially in countering perceptions of these regions as pristine environments. IK, also referred to as traditional (ecological) knowledge, has been defined 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” (Berkes 2008). Notably, IK has the potential to advance a narrative of past environmental conditions, an appropriate baseline against which to judge current state.

A common refrain from my Indigenous community partners in northern Canada

is an expression of the degraded state of the local environment (eg reduced fish and wildlife populations, poor water quality), even when, in many cases, science points to favorable conditions relative to those in other areas. My baseline, however, which includes highly developed regions of temperate North America and Australia, is much different than their baseline. What appears pristine to me is a modified environment in their eyes (Figure 1). This is rooted both in the lived experience of individuals over the course of the 20th century, a time of rapid development upstream and upwind from these locations, as well as in the intergenerational transfer of knowledge accumulated since time immemorial. Subtle changes in ecosystem health are often undetectable in the scientific record due to its emphasis on spatial rather than temporal comparisons (Mantyka-Pringle *et al.* 2017). Yet reading subtle environmental signs and signals was once necessary to ensure individual survival (Berkes 2008), as this depended on an ability to switch prey sources or harvesting locations as prey became depleted, to detect and discard meat of hunted animals that may have carried pathogens or parasites, and to avoid drinking water contaminated with toxins. These examples of lived knowledge have been handed down to current generations who are striving to maintain their connection to the land, and much can be learned from these knowledge keepers.

IK has the potential to meet all four strategic recommendations from Soga and Gaston (2018). First, to *restore the natural environment*, legal frameworks in many countries protect Indigenous rights to hunt, fish, and carry out other traditional activities. As such, Indigenous peoples are on the front lines with respect to ecosystem restoration and protection. Second, to *monitor and collect data*, programs are being enacted to place natural resource management back in the hands of Indigenous people (Luzar *et al.* 2011). IK can help reconstruct historical conditions, and many communities have learned lessons from past instances of overharvesting or overexploitation. Emerging programs that seek to reignite environmental stewardship – such as the Indigenous Rangers in northern Australia (eg Ens *et al.* 2012) – are well equipped to interface with IK because they are implemented locally. Third, IK is relational knowledge (Houde 2007), thereby satisfying the call to *reduce the extinction of experience*. Immersive, land-based programs are being designed to enable the transfer of IK from elders to youth and, in doing so, directly connect youth to their environment. While not all youth will embrace this experience, it is essential that this knowledge transfer be maintained for future generations. This leads to the fourth appeal from Soga and Gaston (2018), to *educate the public*. Wrapped up in national apologies, constitutional amendments, and landmark land-



Figure 1. Ring Lake, a river-connected lake in the Slave River Delta, Northwest Territories, Canada. This lake appeared pristine and had good water quality when tested by the author in 2014, but according to Indigenous knowledge has shallowed over the past 40 years and now produces fewer fish.

transfer agreements is a movement to seek reconciliation between Indigenous and non-Indigenous peoples and to “decolonize” education and research. Our collective relationship with the environment is very much a part of this foundation.

In his original essay on SBS, Pauly (1995) strongly advocated for an embracing of earlier knowledge in present models, noting how astronomy includes ancient observations in its record keeping on phenomena. He also warned against treating such knowledge as mere anecdotes (Pauly 1995). As is the case in the scientific community, there are gradients in expertise within and among members of Indigenous communities. Not all people in Indigenous communities have access to land-based knowledge. Yet experienced harvesters and knowledge keepers, identified locally as experts, are ideally equipped to offer a firm understanding of appropriate baselines. By building strong partnerships between Indigenous and non-Indigenous researchers that are res-

pectful, relevant, reciprocal, and responsible (Kirkness and Barnhardt 1991), we can help counteract ever-shifting baselines and better identify paths forward for environmental protection, management, and restoration.

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