

# ENHANCED U.S.-CANADIAN COLLABORATION ON MARINE MIGRATORY SPECIES

by Jonathan J. Choi, Jess Kuesel, Katline Barrows, Elise Boos, Megan Dister, Connor Sakati, Melissa Skarjune, Stephen E. Roady, and Michelle B. Nowlin

*Jonathan J. Choi is a Ph.D. student with Duke University's Marine Geospatial Ecology Lab. Jess Kuesel is a Law Clerk with the U.S. District Court for the Middle District of Florida. Katline Barrows is a Research Associate at North Carolina State University. Elise Boos is a Research Associate with the Pacific Northwest National Laboratory. Megan Dister is a Law Clerk with the Alaska Supreme Court. Connor Sakati and Melissa Skarjune are students at Duke Law School. Stephen E. Roady is a Senior Lecturing Fellow at Duke Law School. Michelle B. Nowlin is a Clinical Professor of Law and Co-Director of the Environmental Law and Policy Clinic at Duke Law School.*

U.S.-Canadian management of marine migratory species is a particularly rich place to understand the complex relationship between migratory science, conservation, and law. The two nations share a large border, have a long-lasting historic friendship, and already collaborate extensively. However, the relationship is not without contention. The substantial economic interests in the oceans and differences in governance structure have not infrequently frustrated efforts at cooperative management. Indeed, albeit in rare instances, these conflicts have escalated to include hostage taking and warning shots with live ammunition.<sup>1</sup> And even when the two countries endeavor to work closely together, they face daunting management and coordination challenges: the fate of the critically endangered North Atlantic right whale—whose

numbers now hover at only 70 reproductive females—exemplifies the problem.<sup>2</sup>

To explore ways to improve this bilateral relationship and further protect marine migratory species, the Duke University School of Law, the Environmental Law Institute, and both the Marine & Environmental Law Institute and the Ocean Frontier Institute at Dalhousie University in Halifax, Nova Scotia, hosted a workshop in Washington, D.C., in late 2022 that brought together participants from numerous agencies and academic institutions, including the Department of Fisheries and Oceans Canada (DFO), Parks Canada, and the U.S. National Oceanic and Atmospheric Administration (NOAA). In this Comment, we briefly summarize the workshop findings, then build on the separately published workshop proceedings<sup>3</sup> to recommend actions for U.S. lawmakers and regulators to improve the management of migratory marine species that inhabit both U.S. and Canadian waters.

We recommend that both nations should (1) improve scientific collaboration, perhaps by funding a targeted effort to organize existing data and coordinate future research; (2) encourage stakeholder engagement and collaborative research with local organizations, Indigenous partners, and local resource users; (3) dedicate funding for fishing gear changes and accelerate the development and deployment of new technologies; (4) step away from single-species management and toward ecosystem-based management; and (5) reinstate marine spatial planning efforts with an

---

*Authors' Note: This Comment reflects the views solely of the authors, who are Duke University professional degree students, recent graduates, and faculty members. No students or faculty at Dalhousie University participated in the writing of this Comment, nor did any member, staff, or employee of the government of Canada or the United States. Hence, it is neither an official nor an unofficial statement of position on any issue by Duke University, Dalhousie University, or by the Canadian or U.S. governments.*

1. Constance L. Hays, *Fishing Boat Dodges Gunfire and Canadian Navy*, N.Y. TIMES (Dec. 13, 1989), <https://www.nytimes.com/1989/12/13/us/fishing-boat-dodges-gunfire-and-canadian-navy.html>; *Canadians Block U.S. Ferry in Fight Over Salmon Stocks*, TAMPA BAY TIMES (Oct. 1, 2005), <https://www.tampabay.com/archive/1997/07/22/canadians-block-u-s-ferry-in-fight-over-salmon-stocks/>.

2. National Oceanic and Atmospheric Administration (NOAA) Fisheries, *North Atlantic Right Whale Calving Season 2023*, <https://www.fisheries.noaa.gov/national/endangered-species-conservation/north-atlantic-right-whale-calving-season-2023> (last updated May 15, 2023).

3. Jonathan J. Choi et al., *Workshop Report on Transboundary Marine Species at Risk & Their Recovery in a Changing Climate*, Nov. 3-4, 2022 (Washington, D.C.).

eye toward transboundary collaboration and protection to integrate conservation planning across the border shared by the two countries. The recommendations are outlined and discussed in more detail below.

## I. U.S.-Canada Workshop Summary

On November 3 and 4, 2022, a group of government officials, academics, nonprofit scientists, and lawyers gathered at the offices of Duke University in Washington, D.C., to discuss how to improve the management of marine migratory species (specifically whales, sharks, and fish) that cross the U.S.-Canadian border. The convening was sponsored by Duke University, Dalhousie University, and the Environmental Law Institute. The meeting, conducted under the Chatham House Rule, provided ample opportunity for frank discussion and highlighted numerous avenues for coordination between the United States and Canada.

The workshop was organized under six panels:

1. Existing U.S. and Canadian law and policy
2. Existing transboundary cooperative efforts
3. Management for transboundary cetaceans
4. Management for transboundary sharks
5. International law mechanisms that might have implications for future collaboration
6. Other international law collaborative mechanisms as potential examples of effective collaboration for potential lessons

... and had four objectives:

1. To take stock of scientific understandings related to transboundary marine species at risk, including migratory corridors;
2. To compare Canadian and U.S. national approaches and challenges in recovering marine transboundary species at risk;
3. To assess the role and limitations of existing cooperative management mechanisms and consider how such measures could be strengthened to further the recovery of marine species at risk in a rapidly changing ocean; and
4. To explore ways in which bilateral and regional cooperation might be enhanced in the future to address shifting species migrations and distributions, including through the use of effective area-based measures and/or the establishment of a transboundary network of marine protected areas (MPAs).

The workshop focused on key examples of whales, fish, and sharks that straddle the U.S.-Canadian border. Workshop participants agreed that these species are of immense ecological, cultural, and economic value, and that cross-country collaboration is necessary to ensure

their long-term health. At the same time, the workshop recognized that such bilateral collaboration is hampered by differences in the governing structures and priorities of the two countries, as well as by a lack of resources for research and management. The workshop also highlighted the need for baseline data on the basic biology of these species.

Over the course of two days, workshop participants discussed scientific efforts and legal regimes on both sides of the border. They also addressed international law tools and other mechanisms for collaboration. The workshop concluded with small group discussions highlighting potential avenues for improving bilateral cooperation. The workshop participants underscored the following ideas and proposals:

- Existing informal collaboration could be made more efficient by focusing on unifying technological and regulatory systems to ensure interoperability. Data should be shared freely among scientists and made more easily accessible between both nations. Both nations should coordinate fishing and shipping regulations to avoid duplicating efforts or working at cross-purposes. In addition, both nations should adopt comparable processes for MPA designation, design, and monitoring to facilitate research into management efficacy. Finally, research and collaboration should expand to additional species to ensure that numerous aspects to biodiversity are covered.
- Research should be significantly improved by ensuring shared access to data collection platforms such as ships, planes, and satellite time, and by providing multi-year funding commitments to pursue longer-term research and monitoring.
- Sharks and rays remain particularly under-studied and under-protected. Both countries should focus on eliminating unnecessary mortality and rebuilding depleted populations.
- Internationally, both countries should continue to build regional and global cooperation for conservation of migratory species in various forums, including regional fisheries management organizations, the North American Marine Protected Areas Network, and larger treaty processes like the recently concluded biodiversity beyond national jurisdiction process.
- Broader changes in conservation paradigms, such as the inclusion of Indigenous knowledge, implementation of ecosystem-based management (EBM), and consideration of climate change-driven range shifts, are needed to improve long-term management efficacy.
- Building political will is critically important, particularly when conservation action will require trade offs with economic activities.

## II. Post-Workshop Recommendations

Critically, an underlying workshop theme was the need for further collaboration, ensuring that efforts are better coordinated across jurisdictions and species. To encourage such collaboration, we recommend that the United States and Canada:

1. Enhance *scientific collaboration* by improving existing ocean databases, encouraging the development of long-standing relationships based on trust, and securing multi-year funding to help train the next generation of scientists. This process could be administered through a multisectoral research and management entity.
2. Encourage *stakeholder engagement* by making long-term investments in local environmental education, working with Indigenous partners, and endeavoring to build trust with resource users through joint, collaborative research efforts.
3. Actively fund *gear change and technology acceleration* efforts, perhaps through design competitions.
4. Shift from a single-species management approach to a holistic, *EBM program*.
5. Continue with or reinstate *marine spatial planning* (MSP) processes with an eye toward trans-boundary coordination through data-sharing.

### A. Scientific Collaboration

The United States and Canada must streamline scientific collaboration to improve migratory marine animal management, a need made more urgent by accelerating climate change processes. The extent of long-standing and extensive scientific and management collaboration between the United States and Canada reflects the long friendship between both nations. However, the extent of collaboration also leads to distinct coordination challenges, characterized by a lack of clear communication across the sprawling, interconnected web of researchers, databases, and managers.

To address this coordination problem, we recommend that the United States and Canada:

1. Improve existing ocean databases, filling gaps as needed.
2. Require data generated from government-funded research to meet FAIR (Findability, Accessibility, Interoperability, and Reuse of digital assets) access standards.
3. Encourage relationship- and trust-building between academic researchers and managers.
4. Secure multi-year funding for government and academic researchers, allowing agencies to support graduate students and to continue to build their research capacity over time.

5. Establish and fund a joint multisectoral, multistakeholder institution that could house, fund, and coordinate collaborative research and management.

#### 1. Improve Existing Ocean Data Access

The United States and Canada should expand and fund existing data portals to ensure that researchers and managers across both nations and around the world have access to high-quality data. There are numerous databases that could use support, particularly for the basic data maintenance and quality control required to make these databases useful. By supporting data maintenance, the two nations can ensure that there is a stable scientific baseline of biodiversity data that both nations can use to develop robust management protocols.

In particular, the United States and Canada should begin with the Ocean Biodiversity Information System (OBIS). OBIS is an open-source data repository network that holds more than 100 million occurrence records of hundreds of thousands of marine species, and is currently supported through the Intergovernmental Oceanographic Commission organized under the United Nations Educational, Scientific, and Cultural Organization (UNESCO). OBIS functions as a series of data repositories around the world organized either geographically or by theme, such as deep-sea biodiversity, fisheries-related, or harmful algal blooms. Of note for marine migratory species is the Ocean Tracking Network, as explained at the workshop by Dr. Fred Whoriskey, and OBIS-SEAMAP for marine megafauna data housed at Duke University.<sup>4</sup>

#### 2. Require FAIR Data Principles From Funded Research

In addition to funding data maintenance programs to ensure that hard-won data can continue to contribute to scientific research after collection, the United States and Canada should require that data generated from research activities meet the FAIR guidelines<sup>5</sup>:

- *Findable*. Data should be rendered easy to find for humans and machines by including machine-readable, detailed, and identifiable metadata.
- *Accessible*. Data should be easily downloadable, ideally freely and openly, but through an easily understood authentication process if required.

4. Sara J. Iverson et al., *The Ocean Tracking Network: Advancing Frontiers in Aquatic Science and Management*, 76 CANADIAN J. FISHERIES & AQUATIC SCI. 1041 (2019), available at <https://doi.org/10.1139/cjfas-2018-0481>; Patrick N. Halpin et al., *OBIS-SEAMAP: The World Data Center for Marine Mammal, Sea Bird, and Sea Turtle Distributions*, 22 OCEANOGRAPHY 104 (2009), available at <https://doi.org/10.5670/oceanog.2009.42>.

5. Mark D. Wilkinson et al., *The FAIR Guiding Principles for Scientific Data Management and Stewardship*, 3 SCI. DATA 160018 (2016), <https://doi.org/10.1038/sdata.2016.18>.

- *Interoperable*. Data should be capable of being easily used in different programs.
- *Reusability*. Data should be of sufficient quality and the methods should be sufficiently well-described to ensure data and analyses can be reused.

### 3. Build Multi-Institutional Networks to Facilitate International Collaboration

Collaboration across institutions at in-person conferences and convenings remains a central part of international and multi-institutional research. Workshop panelists shared that although building partnerships can be hard work, the effort spent is quite worthwhile; some panelists shared stories of how their partnerships started as a coffee chat at a conference and led to decades-long collaborations. Given the serendipity of this network-building, it is particularly important to reach out to students and early career researchers and to sustain that engagement over several years. By facilitating events at preexisting meetings and conferences or by putting together events focused specifically on transboundary marine species at risk, Canada and the United States could help to encourage emerging informal collaborations.

### 4. Secure Multi-Year Funding Streams

Consistent, reliable funding is vital to enable long-term planning, monitoring, and research. Government workshop participants agreed that stable, multi-year grants similar to those offered by some private foundations, and indeed that are offered by government agencies for university researchers, would help government research. This funding would help agencies design multi-year, long-term monitoring projects that can study year-by-year climatic and behavioral variability. Further, funding that enabled support for graduate students or postdoctoral scholars would allow agencies to commit to supporting and training graduate students, helping to build the pool of highly trained and skilled ocean researchers who understand how research can directly address policy questions.

The current system of year-by-year appropriations, rather than a more stable, multi-year funding process similar to the grant process, can hobble the ability of government agencies to plan multi-year studies. Ideally, funding commitments would be for a decade or longer, allowing DFO and NOAA to establish programs with university partners and recruit graduate students with multi-year commitments, rather than requiring the program to be spun up every time there might be appropriations. In the United States, funding for this type of program could be explored internally within NOAA based on the appropriations from the Inflation Reduction Act of 2022 (IRA).

### 5. Establish an Enduring U.S.-Canadian Multisectoral Research and Management Institution

Rather than continuing to rely on an existing patchwork of formal and informal collaborations, the United States and Canada should commit to sustained funding for a joint research and management institution to coordinate existing efforts and expand data collection, data-sharing, and transboundary EBM. For example, several workshop attendees noted their satisfaction with the North Atlantic Right Whale Consortium model, which includes databases, other resources, and an annual meeting for different stakeholders.<sup>6</sup> The Canada-U.S. Ecosystem Science Working Group (CAUSES) and the Canada-United States Species at Risk Working Group can also serve as potential models.

CAUSES is currently working to go beyond species-by-species science to understand the mechanisms driving whole-ecosystem change. The Species at Risk Working Group already has experience collaborating on Atlantic salmon and North Atlantic right whale conservation and management. The United States and Canada could use these existing collaborations as a model for formalizing collaboration on a broader set of migratory transboundary species, committing either to convening more frequent meetings for rapid data-sharing and management updates or to co-locating somewhere in the United States or Canada to conduct joint research and management planning.

Such an institution would be charged initially with developing shared survey protocols and joint, transboundary models to facilitate data-sharing, research, and management. This collaboration could also develop and support its own independent research infrastructure, including research platforms such as planes or vessels. This institution should also be multisectoral and include Indigenous communities, fishers, scientists, and government regulators. This diverse set of viewpoints and stakeholders may help to bridge any gaps that exist between scientific research, learned experiences, and management plans.

Further, this institution should specifically fund research to support EBM. Rather than taking a species-by-species approach, like traditional stock assessments and species listing under the U.S. Endangered Species Act (ESA),<sup>7</sup> EBM seeks to understand how the ecosystem functions as a whole and how to improve that function through management. A more holistic research approach could allow for new, creative management strategies that can conserve species at risk in novel ways, whether it is through managing prey stocks or by monitoring the activity of other species that use the same prey to understand their distribution.

6. North Atlantic Right Whale Consortium, *Home Page*, <https://www.narwc.org/> (last visited Oct. 11, 2023).

7. 16 U.S.C. §§1531-1544, ELR STAT. ESA §§2-18.

## B. Stakeholder Engagement and Collaboration

To protect transboundary marine species, Canada and the United States should enhance collaboration with all stakeholders. First, actors in both countries should work to foster local conservation champions. Second, decisionmakers should partner with and learn from Indigenous peoples. Third, regulators should work to build trust with resource users and thereby enhance collaboration.

### 1. Long-Term Investment in Local Environmental Education

NOAA, DFO, and university partners should support conservation champions who are leading efforts on transboundary marine species issues. Workshop participants repeatedly asked how to motivate countries to act on transboundary marine species problems, and panelists responded by emphasizing the need for mission-driven champions to lead efforts and motivate action. Establishing the conditions to allow local conservation champions to emerge may involve many different methods, but should involve educating students, improving local participation, and engaging communities in a culturally appropriate manner.

Pairing conservation efforts with environmental education targeted at connecting students and community members with their environment can foster long-term, pro-environment leadership.<sup>8</sup> Efforts to improve this sense of community, place, and environmental identity should aim to provide significant life experiences outdoors and increase exposure to an environmental ethos through teachers, authors, environmental professionals, and others.<sup>9</sup> Directing such long-term investment could help to lay the groundwork for social change in the future.

During his workshop panel presentation, Prof. Boris Worm discussed Dalhousie University's efforts to work in local schools to teach environmental education and foster climate change resilience in Canada. Other universities, NOAA, and DFO should look to Dalhousie's model and other successful environmental education and environmental identity models along with conservation leadership development models to foster the next generation of environmental champions.<sup>10</sup>

### 2. Centering Indigenous Knowledge and Partnering With Indigenous People

The United States and Canada should center Indigenous knowledge and bring Indigenous people into the decision-making processes to manage transboundary marine species. This effort should work toward establishing a continuing partnership with Indigenous people, and incorporating Indigenous knowledge, based on thoughtful participation, respect, and community-building.<sup>11</sup>

Carolina Behe of the Inuit Circumpolar Council Alaska provided numerous suggestions on how to improve Indigenous participation in the November workshop. She suggested that this process should begin with an initial convening that brings together Indigenous knowledge holders, scientists, managers, and policymakers to discuss migratory species conservation and how to move forward. Indigenous partners should be active co-organizers of the meeting, with power to set the agenda and format for the meeting.

This meeting should be paired with an opportunity for Indigenous peoples from both the United States and Canada to exchange ideas and experiences. The topics discussed during the meeting should be established by Indigenous leaders, and could include ways to foster community-led initiatives and approaches, ways to foster co-production of knowledge through bringing together Indigenous knowledge and Western science, and ways to encourage equitable joint decisionmaking with Indigenous peoples.

The United States and Canada should build on this Indigenous peoples' meeting to create a lasting partnership with Indigenous Nations, focusing specifically on the species addressed in this workshop and located in the North Atlantic. This partnership should involve community-led initiatives for adaptive and holistic decisionmaking and knowledge co-production for monitoring, modeling, and assessments. It should promote knowledge pluralism based on the idea that "indigenous and scientific knowledges are fluid, evolving ways of knowing that are mutually informative and may be concurrently mobilized."<sup>12</sup>

The partnership should look to other successful co-management examples in which governments partnered with Indigenous Nations.<sup>13</sup> In particular, the Arctic Council is a potential model; it is an intergovernmental forum that brings together Arctic States and Arctic Indigenous organizations as permanent participants to work on "issues of sustainable development and environmental protection

8. Chelsea Schelly et al., *How to Go Green: Creating a Conservation Culture in a Public High School Through Education, Modeling, and Communication*, 43 J. ENV'T EDUC. 143 (2012), available at <https://doi.org/10.1080/00958964.2011.631611>; Ruolin E. Miao & Nicolette L. Cagle, *The Role of Gender, Race, and Ethnicity in Environmental Identity Development in Undergraduate Student Narratives*, 26 ENV'T EDUC. RSCH. 171 (2020), available at <https://doi.org/10.1080/13504622.2020.1717449>.

9. Miao & Cagle, *supra* note 8, at 172.

10. See Mariasole Bianco et al., *Empowering Emerging Leaders in Marine Conservation: The Growing Swell of Inspiration*, 26 AQUATIC CONSERVATION: MARINE & FRESHWATER ECOSYSTEMS 225 (2016), available at <https://doi.org/10.1002/aqc.2650>.

11. KŪLANA NOI'I WORKING GROUP, KŪLANA NOI'I v. 2 (2021), <https://seagrant.soest.hawaii.edu/wp-content/uploads/2021/09/Kulana-Noii-2.0-LowRes.pdf>; INUIT CIRCUMPOLAR COUNCIL ALASKA, THE ROLE OF PROVIDING—INUIT MANAGEMENT PRACTICES: YOUTH, ELDERS, ACTIVE HUNTERS, AND GATHERERS WORKSHOP REPORT (2019), <https://iccalaska.org/wp-iccl/wp-content/uploads/2022/03/YEAH-Workshop-Report.pdf>.

12. Julia A. Bingham et al., *Knowledge Pluralism in First Nations' Salmon Management*, 8 FRONTIERS MARINE SCI. 3 (2021), available at <https://doi.org/10.3389/fmars.2021.671112>.

13. See William G. Housty et al., *Grizzly Bear Monitoring by the Heiltsuk People as a Crucible for First Nation Conservation Practice*, 19 ECOLOGY & SOC'Y art. 70 (2014), <https://doi.org/10.5751/ES-06668-190270>.

in the Arctic,<sup>14</sup> mirroring the challenges discussed in the November workshop. The partnership should have actionable goals and processes for working toward conservation of transboundary marine species.

### 3. Building Lasting Trust With Resource Users

Workshop participants identified building trust and collaborating directly with resource users as critical to conservation success, as resource users are those who will be most directly affected by policy changes and management choices. If users do not feel that their concerns are considered and mitigated, they can become powerful opponents to change: the ongoing tension between the Maine lobster fishery and the U.S. government—in which entanglement with lobster fishing gear is threatening the survival of the North Atlantic right whale and conservation efforts are perceived as threatening the way of life for lobstermen and the lobster industry—serves as a current illustration of this dynamic. Mutual trust could support stronger collaboration and lead to new solutions, such as ropeless gear, or even transform users into champions of conservation themselves.

Collaborations could be formalized through consultative bodies, such as the committees organized through the U.S. Federal Advisory Committee Act (FACA).<sup>15</sup> Regular consultations allow managers to benefit from citizen knowledge built on a resource user's extensive experience and environmental observations. Further, a committee may increase the legitimacy of controversial decisions, as soliciting, responding to, and relying on citizen views makes the process more open, transparent, and accountable.

In the past, such stakeholder-inclusive committees have been used to develop potentially thorny regulatory frameworks. For example, when the U.S. Environmental Protection Agency (EPA) sought to implement the Clean Water Act (CWA)<sup>16</sup> total maximum daily load program, EPA used the federal advisory committee process. Though the committee could not reach a consensus on all aspects of nonpoint source pollution regulation, EPA based their regulations on sources of water quality impairment on the recommendations of the committee.<sup>17</sup> However, FACA does impose limits on these committees, requiring agencies to “carefully consider” whether a new committee is necessary and dissolving committees once their missions are complete.<sup>18</sup>

Managers can also attempt to relieve a regulation's burden on resource users. Financial assistance for regulated community members, particularly in the case of smaller businesses and individual fishers, could help to build trust

by showing that managers understand, have considered, and attempted to respond to community concerns. For example, fisheries disaster relief laws provide for payments replacing lost commercial fishing incomes that regulatory closures have caused. However, relief disbursements require approval from high-level government officials, congressional allocation, and time to disburse.<sup>19</sup>

Managers could also work toward other efforts to help make up for lost income caused by fisheries closures or gear regulations, including helping to develop markets for sustainably caught local seafood. If those marketing efforts are successful, they may in turn create incentives for other fisheries to adopt sustainable practices or to seek sustainability verification. However, these solutions suffer from price and scalability concerns; relatively fewer consumers may be able to afford more expensive sustainably caught seafood and could turn to other protein substitutes.

### C. Gear Change and Technology Acceleration

We recommend three different technology and equipment-related changes that we believe could improve existing transboundary management:

1. Fund gear change, including weaker fishing ropes and ropeless fishing gear, to improve conservation outcomes for cetaceans.
2. Encourage technology development through design competitions or government acquisitions to develop a suite of new tools to assist research and management ranging from fishing gear to satellite tags.
3. In the United States, NOAA should use recent specific appropriations from the Bipartisan Infrastructure Law (BIL) and IRA to strengthen migratory species conservation.

#### 1. Fund Gear Change

Gear modifications, including weaker fishing ropes and ropeless fishing gear, could contribute significantly to cetacean conservation. Dr. Caroline Good's workshop presentation on U.S. management noted that gear modifications could result in a 47% reduction of fishing gear entanglements for North Atlantic right whales. The need to fund gear change is particularly important given recent litigation and a rider in the 2023 Consolidated Appropriations Act that prevents U.S. NOAA Fisheries from substantially changing its American lobster and Jonah crab fisheries regulations.

Beyond recent appropriations, both the United States and Canada have ongoing efforts to support gear changes. In Canada, DFO has created the Whalesafe Gear Adoption Fund, which provides \$20 million CAD over two years to encourage adoption of gear alternatives. In the

14. Arctic Council, *About the Arctic Council*, <https://www.arctic-council.org/about/> (last visited Oct. 11, 2023).

15. 5a U.S.C. §§1 et seq.

16. 33 U.S.C. §§1251-1387, ELR STAT. FWPCA §§101-607.

17. Linda A. Malone, *The Myths and Truths That Ended the 2000 TMDL Program*, 20 PACE ENV'T L. REV. 63 (2003), available at <https://digitalcommons.pace.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1161&context=pehr>.

18. U.S. EPA, *Summary of the Federal Advisory Committee Act*, <https://www.epa.gov/laws-regulations/summary-federal-advisory-committee-act> (last updated Aug. 3, 2023).

19. CONGRESSIONAL RESEARCH SERVICE, FISHERIES DISASTER RELIEF (2020), <https://crsreports.congress.gov/product/pdf/RL/RL34209>.

United States, NOAA has the Collaborative Gear Lending Library, though the current capacity of the library is limited.<sup>20</sup> Ultimately, however, gear changes can be expensive, ranging from “\$7,500 for one line of traps” up “to \$70,000 for a boat’s total gear conversion.”<sup>21</sup> With such an expensive price tag, fishers may lack the ability to switch their gear, despite government assistance, and forcing adoption could result in fisheries closing altogether.

Due to the significant financial hurdle of ropeless gear, both governments should maintain and increase funding to test and adopt this gear.<sup>22</sup> Grant programs directed to fishers to update their gear could substantially decrease entanglement risk. Models for this type of policy already exist, including the Fishing Gear Location Marking Fund.<sup>23</sup>

## 2. Encourage Tech Development, Especially Interoperability

Accelerating technology development, particularly in scientific monitoring and gear, could dramatically improve conservation outcomes. Real-time tracking through aerial surveys, acoustic surveys, acoustic monitoring, and new gear could help reduce vessel strikes and fishing gear entanglement for cetacean species, while basic database maintenance, data-sharing, and integration would improve species distribution models for other species of concern. Additional satellite tagging and genetic and epigenetic studies could help researchers understand the ways that populations connect different parts of the ocean and how individuals respond to particular stressors. Monitoring and database infrastructure is needed to implement plans for dynamic management, including speed zone plans and fishery closures.

The United States and Canada could fund and accelerate technological developments through design competitions and direct funding for testing. For example, DFO’s existing Whalesafe Gear Adoption Fund helps to support the development of new fishing gear by directly funding gear trials and testing.<sup>24</sup> Both nations, whether jointly or independently, could fund similar efforts to develop new satellite tags or other tools to improve monitoring and management. This process could be structured similarly to military design competitions or procurement, where the military will release a request to industry for a particular technology, vehicle, or weapon fitting a certain set

of parameters. The winner of such a competition could be selected by a panel comprising regulators and resource users, improving the likelihood that technology could meet management goals and be practical for resource users.

Regardless of how technology is developed, the United States and Canada need to ensure that ropeless gear is interoperable.<sup>25</sup> Specifically, ropeless gear needs to be able to communicate across different models so that (1) fishers are able to find their own gear; (2) other fishers can know that fishing gear has already been deployed in the area; and (3) enforcement officials are able to have additional information about *who* has deployed gear for enforcement and management purposes. At present, the situation is not workable: different ropeless gear manufacturers have their own apps to locate traps, but the different apps cannot communicate with each other.<sup>26</sup>

## 3. NOAA Should Use Appropriations to Support Migratory Marine Species Research and Management

Recently, the U.S. Congress enacted the BIL<sup>27</sup> and the IRA, which together represent more than \$1 trillion USD in new spending and tax breaks.<sup>28</sup> U.S. agencies should explore different avenues for deploying this funding to agency programs that support scientific research and management of highly migratory, transboundary marine species.

Under the BIL, NOAA received roughly \$3 billion USD for the next five years for several purposes, including habitat restoration and coastal resilience.<sup>29</sup> NOAA has organized this funding into three initiatives: (1) climate data and services; (2) climate-ready coasts; and (3) fisheries and protected resources.<sup>30</sup> Importantly, \$20 million USD over five years was allocated “[f]or consultations and permitting related to the Endangered Species Act, the Marine Mammal Protection Act [MMPA], and Essential Fish Habitat defined by the Magnuson-Stevens Fishery Conservation and Management Act.”<sup>31</sup> This funding should be especially helpful for several of the migratory species addressed in this workshop, many of which are protected by the ESA and/or MMPA. Other promising sections of the BIL include

20. NOAA FISHERIES, DRAFT ROPELESS ROADMAP: A STRATEGY TO DEVELOP ON-DEMAND FISHING 8 (2022), <https://ropeless.org/wp-content/uploads/sites/112/2022/08/RopelessRoadmapDRAFT-NEFSC.pdf>.

21. Eve Zuckoff, *Ropeless Fishing Shows Promise, but There’s a Catch: Financial, Safety, Technology Challenges*, GBH (Feb. 12, 2021), <https://www.wgbh.org/news/local-news/2021/02/12/ropeless-fishing-shows-promise-but-theres-a-catch-financial-safety-technology-challenges>.

22. New U.S. federal funding opportunities should be in addition to the Bycatch Reduction Engineering Program and the Saltonstall-Kennedy Grant Program, and should specifically focus on upgrading gear.

23. Fishing Gear Location Marking Fund, *Home Page*, <https://www.gear-fund.org/> (last visited Oct. 11, 2023).

24. DFO, *Whalesafe Gear Adoption Fund Application Guidelines*, <https://www.dfo-mpo.gc.ca/species-especes/mammals-mammiferes/whales-baleines/gear-equipement/guidelines-lignes-directrices-eng.html> (last modified Dec. 22, 2021).

25. NOAA has already partnered with EarthRanger “to create a ropeless geolocation system,” and continued cooperation should be encouraged to support interoperability. NOAA FISHERIES, *supra* note 20, at 18-19.

26. Zuckoff, *supra* note 21.

27. Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429 (2021).

28. *See The Inflation Reduction Act: Here’s What’s in It*, MCKINSEY & CO. (Oct. 24, 2022), <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/the-inflation-reduction-act-heres-whats-in-it>; *Legislative Analysis for Counties: The Bipartisan Infrastructure Law*, NAT’L ASS’N CNTYS. (Mar. 4, 2022), <https://www.naco.org/resources/legislative-analysis-counties-infrastructure-investment-jobs-act>.

29. NOAA, *Bipartisan Infrastructure Law*, <https://www.noaa.gov/infrastructure-law> (last updated Sept. 28, 2023).

30. *Id.*

31. NOAA, *Consultations and Permitting*, <https://www.noaa.gov/infrastructure-law/infrastructure-law-fisheries-protected-resources/consultations-and-permitting> (last updated June 28, 2022); 16 U.S.C. §§1361-1421h, ELR STAT. MMPA §§2-410.

funding for habitat restoration,<sup>32</sup> projects under the Coastal Zone Management Act (CZMA),<sup>33</sup> National Oceans and Coastal Security Fund grants,<sup>34</sup> and voluntary ecosystem restoration grants.<sup>35</sup>

The IRA, which allocated roughly \$3.3 billion USD in funding to NOAA for science, service, stewardship, facilities, and aircraft, provides other opportunities for migratory marine species conservation.<sup>36</sup> For example, NOAA received roughly \$2.6 billion USD in funds “to conserve, restore, and protect coastal and marine habitats and resources, support natural resources that sustain coastal and marine resource dependent communities, and complete marine fishery and marine mammal stock assessments.”<sup>37</sup> Another \$200 million USD was appropriated for several purposes, including “for competitive grants to fund climate research as it relates to weather, ocean, coastal, and atmospheric processes and conditions, and impacts to marine species and coastal habitat.”<sup>38</sup> This funding could be especially helpful in fostering an ecosystem-based management approach.

Specific national programs in NOAA Fisheries that could benefit from this funding include the Office of Protected Resources, Office of Habitat Conservation, Office of Law Enforcement, Office of Sustainable Fisheries, and Office of Science and Technology.<sup>39</sup> Each of these offices plays a crucial role in advancing the conservation of migratory marine species. Overall, with a historic amount of new funding available, NOAA should seek opportunities to utilize these funds to support transboundary marine species data collection and management.

#### D. EBM

The United States and Canada must both move toward management plans that consider overall ecosystem health rather than narrow, single-species management. EBM approaches focus on developing a holistic understanding of natural and social systems and managing for the health of the overall ecosystem, rather than focusing individually on a single species and its recovery.<sup>40</sup> EBM should also broadly

consider how climate change will affect overall ecosystem function and how migrations generally change ecosystems by introducing new nutrients or new predators and prey.<sup>41</sup>

Efforts to improve EBM are already underway, as seen in Dr. David Wiley’s presentation in workshop Panel 5, where he explained that he and his colleagues at Stellwagen Bank National Marine Sanctuary are using tagged shearwater birds to try to predict the location of humpback whales. This would allow managers to use shearwater flocks to identify potential areas of increased entanglement risk for humpback whales and to then create real-time fishery closures, narrowing the impact on local fishers as compared to longer-term fishery closures. Additional research is underway to find a similar tool for North Atlantic right whale management. Further, panelists praised CAUSES, which considers entire ecosystems instead of individual species and specifically encourages scientists from both countries to collaborate, share data, and communicate across the jurisdictional divide.

We further identify two additional avenues for implementing EBM: the 1990 Canada-United States Fisheries Enforcement Agreement and the Magnuson-Stevens Fishery Conservation and Management Act.

#### 1. Build on the 1990 Canada-United States Fisheries Enforcement Agreement

The 1990 Agreement was followed by the creation of the Canada-U.S. Transboundary Resources Steering Committee, which serves as the parent organization for CAUSES. CAUSES facilitates collaboration on ecosystem function and climate change research to inform management of shared stocks. Joint appropriations would encourage transboundary ecosystem-based fisheries management, and further commitments to North Atlantic conservation would signal efforts to take the challenge seriously. Such an agreement could also serve as the basis for coordinating further collaboration and integration, including the creation of a joint scientific research center like the one discussed previously in these recommendations.

#### 2. Integrate EBM Into the Magnuson-Stevens Act

The existing Magnuson-Stevens Fishery Conservation and Management Act reflects a traditional species-by-species management approach grounded in individual stock assessments and fishing quotas that should be updated to encourage EBM. Though the proposed Sustaining America’s Fisheries for the Future Act would provide important initial funding for education about EBM, the Act could be further strengthened by additional research and management authorization.<sup>42</sup> Additional research into the broader

32. Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, Div. J, 135 Stat. 429, 1350, 1355-56 (2021).

33. *Id.*; 16 U.S.C. §§1451-1466, ELR STAT. CZMA §§302-319.

34. Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, Div. J, 135 Stat. 429, 1350, 1355 (2021).

35. Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, §40804, 135 Stat. 429, 1105-06 (2021).

36. News Release, NOAA, Statement From NOAA Administrator on Signing of Historic Inflation Reduction Act, (Aug. 16, 2022), <https://www.noaa.gov/news-release/statement-from-noaa-administrator-on-signing-of-historic-inflation-reduction-act>.

37. JANE A. LEGGETT & JONATHAN L. RAMSEUR, CONGRESSIONAL RESEARCH SERVICE, INFLATION REDUCTION ACT OF 2022 (IRA): PROVISIONS RELATED TO CLIMATE CHANGE (2022), <https://crsreports.congress.gov/product/pdf/R/R47262>.

38. *Id.*

39. A full list of NOAA Fisheries national program offices can be found on their website. NOAA Fisheries, *National Program Offices*, <https://www.fisheries.noaa.gov/contact-directory/national-program-offices> (last visited Oct. 11, 2023).

40. Gonzalo Delacámara et al., *Ecosystem-Based Management: Moving From Concept to Practice*, in ECOSYSTEM-BASED MANAGEMENT, ECOSYSTEM SERVICES,

AND AQUATIC BIODIVERSITY 39 (Timothy G. O’Higgins et al. eds., Springer 2020), available at [https://doi.org/10.1007/978-3-030-45843-0\\_3](https://doi.org/10.1007/978-3-030-45843-0_3).

41. Silke Bauer & Bethany J. Hoye, *Migratory Animals Couple Biodiversity and Ecosystem Functioning Worldwide*, 344 SCIENCE 1242552 (2014), <https://doi.org/10.1126/science.1242552>.

42. H.R. 4690, 117th Cong. (2021).



food web and the populations of predator, prey, and competitor species could help fishery managers track the overall health of the ecosystem and manage accordingly.<sup>43</sup>

For example, the porbeagle shark feeds on Atlantic herring and Atlantic mackerel, two fisheries that have fishery management plans in the Northeast United States. Closing those fisheries during porbeagle shark breeding and rearing seasons may further efforts to conserve and protect the endangered species.<sup>44</sup>

## E. MSP

The United States and Canada should renew efforts to implement MSP, which aspires to manage ocean space collaboratively in a way akin to city zoning. MSP attempts to consider all activities and stakeholders in an area to understand how these sectors go about their work on explicit spatial and temporal scales. The process then attempts to coordinate these activities such that each activity has a designated time and place while still meeting conservation goals. Though the process can be contentious due to competing uses, both nations have models in place that they should expand to implement MSP: the Canadian Marine Plan Partnership (MaPP) and the U.S. Northeast and Mid-Atlantic Regional Plans.

### 1. The MaPP

In Canada, the MaPP is a collaborative effort between First Nations and British Columbia's provincial government. It integrated numerous activities affecting the Northern Shelf into a Regional Action Framework that is further subdivided into four sub-regional marine plans, each with EBM, detailed protections, and management zones.<sup>45</sup> The EBM framework aimed to protect the integrity of marine ecosystems, improve human well-being, impement collaborative governance, and develop an improved understanding of the complex marine ecosystem.<sup>46</sup> The overarching Regional Action Framework focuses on five main activity areas: regional governance, ecological integrity and human well-being, compliance and enforcement, cumulative effects assessment, and zoning recommendations.<sup>47</sup>

The MaPP process also represents Indigenous-driven co-governance in practice, with success determined by enhanced ecosystem integrity through new area-based management and protection, increased monitoring and surveillance by Indigenous stewardship groups, increased data collaboration from multiple stakeholders, and strategic development of marine projects with an eye towards

long-term sustainability.<sup>48</sup> We recommend that Canada build on the success of the MaPP and use it as a model when expanding MSP throughout Canadian waters.

### 2. The U.S. Northeast and Mid-Atlantic Regional Plans

During the Barack Obama Administration, regional planning bodies across the United States began to develop marine spatial plans, but after federal support was pulled during the Donald Trump Administration, only the Northeast Regional Ocean Council (NROC) and the Mid-Atlantic Regional Council on the Ocean continued working on MSP. These two bodies have coordinated a diverse suite of stakeholders and assembled data to produce regional ocean plans.

For example, NROC includes representatives from six states, nine federal agencies, 10 tribes, and the New England Fishery Management Council.<sup>49</sup> Their joint efforts culminated in the 2016 Northeast Ocean Plan, which synthesizes and summarizes the disparate needs of different ocean user groups and outlines best practices for ocean planning. NROC also created the Northeast Ocean Data Portal, which incorporates spatially referenced data from a variety of different ocean interests, including conservation, commercial fishing, aquaculture, recreation, energy, and cultural resources. Further, the Northeast and Mid-Atlantic Regional Councils are joint hosts for the Regional Wildlife Science Collaborative for Offshore Wind, which has rapidly developed a research plan to address information needs in anticipation of East Coast offshore wind energy development.

Though the question of whether these spatial plans will become legally binding has been left in limbo by changes at the federal government, the process nevertheless produced a guiding document that provides the basis for future MSP efforts.

From both the Canadian and U.S. MSP experiences, two additional recommendations merit attention:

1. MSP must be built on inclusive, transparent processes that involve multiple stakeholders, and especially Indigenous groups, from the outset.
2. MSP should be geared toward eventual trans-boundary coordination, such that U.S. and Canadian plans involve proactive data-sharing that happens as plans are developed.

□ *Inclusive, transparent, multistakeholder processes.* Because MSP explicitly involves the balancing of uses between all ocean users, it must be built on an inclusive, transparent process that involves as many stakeholders as

43. Andrea Treece, *Sweating the Small Stuff: Managing Fisheries and Fostering Marine Ecosystem Resilience in the Face of Climate Change*, 9 GOLDEN GATE U. ENV'T L.J. 137 (2016).

44. *Id.*

45. Steve Diggon et al., *The Marine Plan Partnership for the North Pacific Coast—MaPP: A Collaborative and Co-Led Marine Planning Process in British Columbia*, 142 MARINE POL'Y 104065 (2022), <https://doi.org/10.1016/j.marpol.2020.104065>.

46. *Id.*

47. *Id.*

48. *Id.*; *Deep Collaboration for the Great Bear Sea*, NATURE UNITED (June 2, 2019), <https://www.natureunited.ca/about-us/where-we-work/pacific-ocean/marine-planning-partnership/>.

49. See Northeast Ocean Planning, *Home Page*, <https://neocanplanning.org/> (last visited Oct. 11, 2023).

possible, especially Indigenous groups. Transparency, particularly in data collection and sharing, is vital to establishing core sets of data that everyone can trust.<sup>50</sup> Formal mechanisms for communication among different jurisdictions and stakeholders can ensure consistent feedback, preventing surprise disagreements along the way.<sup>51</sup> Finally, inclusion of Indigenous groups both improves the overall plan and respects sovereignty through consultation requirements.<sup>52</sup>

The Rhode Island Ocean Special Area Management Plan is a successful example of this type of transparent process, whereby state, federal, and tribal officials worked with fishers and other stakeholders to develop a plan that maximized anticipated wind energy development while minimizing ecosystem harm.<sup>53</sup>

□ *Transboundary MSP requires coordination and data-sharing.* As MSP processes begin, the United States and Canada should be actively considering how to implement transboundary MSP to ensure that marine migratory species have adequate protections as they travel between the

two countries. As highlighted by Sofia O'Connor in workshop Panel 5, transboundary MSP does not require that both nations adopt a unified plan together, but does require that nations actively consider which nation or entity should play a convening role to ensure consistent communication and data-sharing between the two nations. Such coordination could be modeled after the existing Gulf of Maine Council on the Marine Environment, which already works on EBM and public participation in efforts to protect the Gulf of Maine.

### III. Conclusion

The U.S.-Canadian workshop convened in November 2022 provided an opportunity for experts from both countries to reflect on the challenges presented in managing and protecting marine species whose life histories take them to both sides of the border. Building on the deliberations of those experts, the recommendations presented here are designed to improve overall management and protection efforts.

---

50. Charles N. Ehler, *Two Decades of Progress in Marine Spatial Planning*, 132 MARINE POL'Y 104134 (2021), <https://doi.org/10.1016/j.marpol.2020.104134>.

51. Michael Kull et al., *International Good Practices for Facilitating Transboundary Collaboration in Marine Spatial Planning*, 132 MARINE POL'Y 103492 (2021), <https://doi.org/10.1016/j.marpol.2019.03.005>.

52. *Id.*

53. Stephen B. Olsen et al., *The State of Rhode Island's Pioneering Marine Spatial Plan*, 45 MARINE POL'Y 26 (2014), <https://doi.org/10.1016/j.marpol.2013.11.003>.