



Summary Report for NAMPAN's Deep Dive on Ecological Connectivity and Transboundary Species

Held on January 18, 2023

Summary of the Deep Dive Program

As part of ongoing network activities, the North American Marine Protected Areas Network (NAMPAN) hosted a Deep Dive on Ecological Connectivity and Transboundary Species, with a focus on marine mammals, fish and sharks, and seabirds. The three-hour event brought together 63 practitioners working in marine protected areas (MPAs) throughout Canada, Mexico, and the United States. The goal of the Deep Dive event was to represent these practitioners' experiences, share information on existing projects with peers, examine the challenges and limitations to ecological connectivity, identify opportunities for collaboration across MPA networks, and highlight the next steps for NAMPAN. The event opened with a panel of experts who shared their perspectives:

- **Mary Collins** - *International Program Conservation Associate, Center for Large Landscape Conservation (Moderator)*
- **Andrew Trites** - *Professor, Institute for Oceans and Fisheries, Department of Zoology, University of British Columbia; Director, Marine Mammals Research Unit*
- **Elva Escobar Briones** - *Senior Researcher, Institute of Marine Sciences and Limnology, Universidad Nacional Autónoma de México*
- **Aurore Maureaud** - *Postdoctoral Associate, Department of Ecology, Evolution & Natural Resources, Rutgers University*

Following the panel, attendees were divided into breakout groups by geographic region (East Coast and West Coast of North America) and thematic interest (marine mammals, fish and sharks, seabirds, and generalists). The groups considered the topics of ecological change, policy, and management as they relate to connectivity and transboundary species. A final plenary session, led by the event moderator, provided the opportunity for attendees and panelists to come together as a larger group to consider the topics of discussion and develop the event's main takeaways.



This report consolidates key points from the panel presentations, breakout group discussions, and the closing plenary conversations. This report is available together with a list of panelist presentations and resources ([Appendix A](#)) and recordings from the opening panel and closing plenary.



Key Takeaways

There is a need for coordinated management and policy response to changes in species distribution.

Changes to species distribution and migratory patterns are being observed in North America's marine environments [e.g., Guadalupe fur seals (*Arctocephalus townsendi*), right whales (*Eubalaena glacialis*), northern elephant seals (*Mirounga angustirostris*), California sea lions (*Zalophus californianus*), grey whales (*Eschrichtius robustus*), southern resident killer whales (*Orcinus orca*)], but the consequential management and policy responses related to these changes are not developing at the same pace. Cross-border efforts to collaborate on scientific research exist and are relatively strong across North America. However, the process of making management and policy decisions can often lack the coordination and collaboration necessary to translate science into executable management actions and policy enactment. While the degree of this issue varies across nations and sites, there is an overall need to advance informed policy development across Canada, Mexico, and the United States through improved integration of the latest scientific research and management knowledge. The integration of connectivity language into local, national, and international policy is an essential next step; however, strategies for moving forward can be nuanced, depending on the laws and restrictions of other countries and jurisdictions as well as the capacity (staff, funding, resources) of management agencies.

Data and tools should be shared and accessible across North America.

It is imperative that practitioners have the ability, opportunity, and avenues to connect with each other (regionally and internationally) to share and access datasets and tools and to develop standardization methods. While stock assessments of marine mammal, fish, and shark species are currently conducted at regional and national levels as species move northward, these assessments do not necessarily correspond to the actual status of these species, due in part to a lack of standardization and data sharing. NAMPAN could play a role in bringing together key players to develop connectivity metrics that may help to standardize these efforts.

Management must consider uncertainty, climate projections, and climate change's current and future impacts.



Climate change is causing shifts to baselines, impacting species' migration and behavior, and causing habitat compression. The identification of locations that can have an outsized impact in conserving climate refugia, especially under climate change, is critical to the health of an MPA network and its component parts. Managers should integrate climate change predictions and impacts into MPA design, priorities, and decision-making, based on the best scientific knowledge. Attendees pointed out that managers need to consider longer timeframes when adapting MPA management actions for climate change. Managers should use this information to help stakeholders, communities, and policymakers understand the uncertainty of the future movements of species and the potential impacts of climate change on MPAs. As one attendee stated, “...*things are changing and will keep changing.*” Managers must work together to address and adapt management actions to these changes and uncertainties.

For successful MPA and species' management, industry, community, and social factors must be recognized and addressed.

MPA management actions can have socioeconomic impacts (e.g., repercussions on fisheries). However, the impacts of these actions on coastal communities have not been adequately evaluated. Working directly with local stakeholders to understand impacts on industry (e.g., fisheries, transportation) and communities (e.g., fishing, recreation) as well as implementing efforts to increase environmental education and ocean literacy could help facilitate community buy-in. Managers need to consider during this process that MPA management and the way other industries/sectors are governed can differ greatly, depending on country regulations and political environments. Besides MPAs, ecological planning should be strengthened in urban areas linked to marine areas (e.g., the discharge of wastewater and other waste and litter, pollution).

Key Challenges and/or Limitations

Communication and Coordination

Communication and coordination can be a challenge in linking science to management action and policy due to a lack of established communication channels or platforms and a common language. This communication can take the form of sharing management frameworks with stakeholders or the communication of connectivity science with decision-makers. There can be difficulties in communicating the need for larger MPA networks and



the development of appropriate and effective guidance, models, and tools may help increase the involvement of decision-makers. Scientific evidence supports the importance of connectivity in conservation, but better communication is needed with decision-makers to help make policy changes. Scaling up communication is also an issue. Channels of communication may be successful among stakeholders within one site or project, but severely challenged when broadened to the international and multi-site scale that includes representation from managers, decision-makers, scientists, and community stakeholders. Once communication channels are established, taking those conversations and turning them into management responses is another challenge. Attendees suggested that raising awareness about the benefits of MPAs and increasing ocean literacy among MPA users (e.g., fisheries, tourists, local communities, researchers, and recreators) could help increase understanding and aid the success of MPAs over the long term. Attendees also stressed that increased and effective communication and connection can build the capacity to manage connectivity.

Data and Tools

Ensuring the accuracy, accessibility, comparability, and availability of data and tools can be challenging when there are numerous ways data are collected and disseminated across MPA networks and international borders. Attendees made clear the need for standardization of data and methodologies used for indicators of the conservation and protection of transboundary/migratory marine species (e.g., species' density, health, and persistence, as well as environmental quality, oceanic conditions, and marine use/impacts of human activities). Specifically, attendees mentioned developing and standardizing metrics for conservation and protection goals that focus on habitat/reserve connectivity and also consider multiple species rather than solely the geographic distribution of a single species. Additionally, long-term data collection must be increased to demonstrate and evaluate the effectiveness of MPAs and management for transboundary species. Feasibility is often impacted by staff capacity, funding commitments, and cross-boundary collaboration. Greater exchange of information and increased scientific cooperation are necessary in order to understand the behavior of species.

Ecological Considerations for Management

The protection of habitat for transboundary species is challenged simply by the fact that they move across boundaries and will spend periods of their life cycles in different locations.



Protected areas and/or regulations may be created around the known reproductive areas of a certain species, but other parts of that species' life cycle likely take place outside those jurisdictions. For example, Atlantic salmon (*Salmo salar*) migrate from regulated inland areas to the open ocean after spawning. It becomes difficult to control or manage populations, particularly with the added complication of overfishing by some commercial and high-seas fisheries. Changes in species' movement patterns and foraging and reproductive behaviors have also been observed that are due to shifting environmental conditions (e.g., increases in air and water temperatures). This adds complexity when addressing management gaps and establishing connectivity. Population declines have also been observed in some transboundary species (e.g., sea lions and pelicans in coastal areas of Mexico) while others are increasing (e.g., Guadalupe fur seals). Because of their migratory nature, these species' population fluctuations are not just an issue for one country, but for neighboring countries as well. Attendees posed the question that, as distributions and migratory routes shift/change, how are we continuing to ensure protection for these species?

Key Opportunities

Possible ways challenges could be addressed

- Leverage and share what we already know (i.e., existing experience and resources).
- Design and develop networks of stakeholders that are representative of all key players (e.g., scientists, MPA managers, policymakers, and community stakeholders).
- Integrate citizen science activities.
- Scientific and management collaboration and coordination through networks such as NAMPAN.
- Integrate climate change projections and predicted future impacts into MPA design, priority identification, and decision-making.
- Increase collaboration and support a stronger interface between academic research, on-the-ground MPA management, and decision-makers. This is particularly valid in areas that share ecosystems.
- Understand the role of area-based management for connectivity and establish public co-management policies.
- Consider if managers have the information they need to make decisions and how nimble, effective, or applicable are the tools in addressing the needs of the MPA and implementing work quickly and effectively?



- Standardize data collection by harmonizing metrics to ensure comparability of data. Metrics are needed for targets and goals that can be used by each country and where data are shared that will be comparable and compatible.

NAMPAN's role in future coordination and knowledge-sharing

NAMPAN regularly brings together managers and experts to build cross-boundary connections, exchange practitioners' experiences and knowledge, and build trusting partnerships that are important for addressing transboundary issues. The Network is uniquely positioned to address issues that individual sites cannot address alone. Attendees reported that NAMPAN could provide support to its community in the following ways:

- Build capacity for efforts such as species' monitoring
- Help standardize and develop indicators/metrics for connectivity so there are commonalities in baselines that can be shared across borders
- Provide guidance and tools that support policy change and management in a way that advances causes at the country level
- Continue to provide a space for lessons learned to be shared with peers at the international level
- Connect experts via events dedicated to specific interests/expertise
- Provide funding and/or disseminate information about funding opportunities

Conclusions

This event was the third virtual Deep Dive meeting hosted by NAMPAN, and the first focused specifically on marine transboundary species in Canada, Mexico, and the United States. Attendees emphasized the importance of convening data experts with stakeholders in academic, political, and management backgrounds in order that science might be better aligned with policy and management activities. In addition, efforts should be made to understand the differences and commonalities of these groups' needs and challenges. NAMPAN is positioned to facilitate these conversations, help coordinate the sharing of data and tools, and ignite conversations that will advance science and monitoring efforts for transboundary species in MPAs across North America.

Appendix A: Panel Presentations and Resources

Moderator and Panelist Presentations

- **Mary Collins** - *International Program Conservation Associate, Center for Large Landscape Conservation* (Moderator)
 - [An Introduction and Review of Ecological Connectivity in Science and Policy](#)
- **Andrew Trites** - *Professor, Institute for Oceans & Fisheries, Department of Zoology, University of British Columbia; Director, Marine Mammals Research Unit*
 - [Transboundary Marine Mammals](#)
- **Elva Escobar Briones** - *Senior Researcher, Institute of Marine Sciences and Limnology, Universidad Nacional Autónoma de México*
 - [Importance of Scientific Research and Opportunities for Collaboration](#)
- **Aurore Maureaud** - *Postdoctoral Associate, Department of Ecology, Evolution & Natural Resources, Rutgers University*
 - [Conservation of Transboundary Marine Species](#)

Resources

Journal Articles

- Gutiérrez-Osuna, M. del C., Díaz-Gaxiola, J. M., Trites, A. W., & Hernández-Camacho, C. J. (2022). [New Colony of Guadalupe Fur Seals \(*Arctocephalus townsendi*\) Discovered on El Farallón de San Ignacio Island, Gulf of California.](#) *Marine Mammal Science*, 38(1), 374–382.
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[Marine Species across International Boundaries? A Global Survey of Scientific Bottom Trawl Data.](#) *Global Change Biology*, 27(2), 220–236.

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- Munguia-Vega, A., Jackson, A., Marinone, S. G., Erisman, B., Moreno-Baez, M., Girón-Nava, A., Pfister, T., Aburto-Oropeza, O., & Torre, J. (2014). [Asymmetric Connectivity of Spawning Aggregations of a Commercially Important Marine Fish Using a Multidisciplinary Approach.](#) *PeerJ*, 2, e511.
- Pace, C. N., Webber, M. A., Tobin, D. D. B., Pemberton, S., Belovarac, J., & Goertz, C. E. C. (2022). [The Northernmost and Westernmost Records of the Guadalupe Fur Seal \(*Arctocephalus philippii townsendi*\).](#) *Aquatic Mammals*, 48(6), 592–601.
- Palacios-Abrantes, J., Sumaila, U. R., & Cheung, W. W. L. (2020). [Challenges to Transboundary Fisheries Management in North America Under Climate Change.](#) *Ecology and Society*, 25(4), art41.
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- Spijkers, J., & Boonstra, W. J. (2017). [Environmental Change and Social Conflict: The Northeast Atlantic Mackerel Dispute.](#) *Regional Environmental Change*, 17(6), 1835–1851.

Reports

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- IPBES. (2019). [Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services](#) (Version 1). Zenodo.
- [Monitoring Framework for the Kunming-Montreal Global Biodiversity Framework](#). (2022). Conference of the Parties to the Convention on Biological Diversity.
- IPCC. (2022). [IPCC Sixth Assessment Report - Climate Change 2022: Impacts, Adaptation, and Vulnerability](#).
- [United States-Mexico-Canada Agreement Implementation Act](#). (2020).

Books

- [Exploration of the Seas: Voyage into the Unknown](#). (2003). National Academies Press.

Maps, Datasets, Tools

- [Whale Insight](#)
- [Ocean Tracking Network](#)

Other Resources

- [United Nations Decade of Ocean Science for Sustainable Development 2021-2030](#)
- [Building Global Knowledge of Marine Life for Local Action. Marine Life 2030](#)
- [Ocean Decade Launches New Call for Decade Actions No. 04/2022](#)
- [Global Transboundary Conservation Network](#)
- [Understanding Gulf Ocean Systems Grants](#)
- [IUCN WCPA Connectivity Conservation Specialist Group](#)
- [Connectivity Conservation Specialist Group: Marine Connectivity Working Group](#)
- [Globescapes](#)
- [Panorama – Solutions for a Healthy Planet](#)
- [International Seabed Authority: Protection of the Marine Environment](#)