RESILIENCE AND MANAGEMENT OF ARCTIC WETLANDS

KEY FINDINGS AND RECOMMENDATIONS

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ARCTIC COUNCIL

CAFF
Conservation of Arctic Flora and Fauna

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- Norwegian Environment Agency, Trondheim, Norway
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- United States Department of the Interior, Fish and Wildlife Service, Anchorage, Alaska

CAFF Permanent Participant Organizations:

- Aleut International Association (AIA)
- Arctic Athabaskan Council (AAC)
- Gwich'in Council International (GCI)
- Inuit Circumpolar Council (ICC) – Greenland, Russia, Alaska and Canada
- Russian Indigenous Peoples of the North (RAIPON)
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INTRODUCTION

Many of the world's wetlands are found in the Arctic, where a complex mix of peatlands, shallow open waters, wet tundra, and coastal flats are important parts of all Arctic ecosystems. Arctic wetlands are globally important as wildlife habitats and migration pathways, and through the role they play in maintaining healthy ecosystems, biodiversity, carbon storage and other ecosystem services. While many of Earth's intact wetlands are in Arctic states, there are also very large expanses of degraded wetlands in Arctic and Boreal zones, affected by e.g. drainage and peat mining. However, these crucial ecosystems are changing due to climate-change driven permafrost degradation and growing pressures from increased human presence. Effective management of wetlands, including conservation and restoration efforts, holds enormous potential to contribute significantly to climate adaptation and mitigation, and conservation of biodiversity.

The purpose of the Resilience and management of Arctic Wetlands (RAW) initiative is to strengthen engagement on the roles and functions of wetlands as a resource to support sustainable development and resilience in the Arctic. Phase 1 (2017-2019) mapped the state of knowledge on resilience and management of Arctic wetlands in response to global drivers such as climate change or more local drivers such as changes in land use. Phase 2 (2019-2020) identified case studies of wetlands management and conservation, considered indigenous participation in wetlands management, and explored approaches to make national inventories more comparable; and Building upon the outcomes of Phases 1 and 2, Phase 3 (2020-2021) developed a series of key findings and recommendations designed to maintain and even strengthen the resilience of wetlands. Many of these findings and recommendations are highly relevant both within and outside the Arctic, and Arctic States have the opportunity to act as role models for sustainable use of wetlands.

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KEY FINDINGS

1. Arctic wetlands provide important ecosystem services to Arctic and global communities, including cooling the global climate. They provide clean water and buffer floods and droughts, support fisheries and hunting, support biodiversity, and act as long-term sinks for atmospheric carbon. Wetlands are an integral part of many Indigenous Peoples' lives; they provide and sustain food security, including grazing for traditional reindeer herding. Recognition of wetlands' importance, including in the Arctic, is growing as their role in sustaining a wide range of ecosystem services becomes better understood.

2. The substantial ecosystem services provided by Arctic wetlands should be recognized at the international level. Presently, there is limited

coordination on how ecosystem services from Arctic wetland management are reported to international frameworks or conventions on climate change mitigation and biodiversity. Common guidelines on how ecosystem services gained from wetland conservation and restoration actions are reported internationally could increase their global recognition.

3. Anthropogenic climate change is a serious threat to Arctic wetland ecosystems and exacerbates many other threats. Widespread climate change impacts in Arctic wetlands are ongoing and projected to increase in this century and reducing greenhouse gas emissions is necessary to limit these impacts. Climate-driven permafrost thaw and increased drought conditions impacting wetland ecosystems will cause greater fire occurrences and shifts in hydrological flows, affecting wetland ecosystem services and biodiversity. Sea level change and declines in sea ice are driving increases in coastal erosion that threatens many coastal wetlands. Thawing permafrost is projected to transform peatlands from a net sink of greenhouse gases to a net source lasting for several centuries.

4. Although the majority of Arctic wetlands remain relatively intact, changes are already occurring across the Arctic and wetland resilience is needed to buffer further damage. Wetlands are vulnerable to substantial indirect damage e.g. through global warming, changes to precipitation patterns, altered hydrological flows, and environmental pollutants. Such damage also constitutes a broader threat to migratory animal populations. These diverse threats to wetland ecosystems emphasize the need for landscape scale management with a focus on conservation, protection and maintained resilience.

5. In some regions, Arctic wetlands are already degraded by human land use and an ever-growing human footprint poses threats to wetland functioning. This damage occurs in both Arctic and Boreal zones and arises from a number of threats such as expansion of forestry, agriculture, hydropower, extraction of peat, fossil fuels or minerals, threats to coastal wetlands from increased Arctic shipping and construction of new infrastructure. Wetlands are also vulnerable to human disturbances to permafrost or adjacent upland habitats and changes to the water balance or hydrological connectivity that can transform wetland function. Drained wetlands release carbon to the atmosphere instead of storing it, and the negative effect lasts for decades to centuries. Other losses of function include loss of biodiversity, changes to habitats and reduced capacity to buffer floods or droughts.

6. Indigenous Peoples' knowledge and stewardship is important for successful management of Arctic wetlands. Participation and leadership by Indigenous Peoples is needed for decision-making and management of Arctic wetlands. Indigenous Peoples' hold extensive and unique knowledge regarding the wetlands in their homelands. In many places, long-term indigenous stewardship has partly shaped present-day wetland biodiversity and functioning, maintaining traditional land-use practices that acts to preserve wetland resilience.

7. The extensive scientific, Indigenous, institutional, and local knowledge on Arctic wetlands could inform broad and rapid actions to protect, conserve and restore wetlands if supported by policy. Noting the stewardship and wealth of knowledge of Arctic communities, and existing science, the key obstacles to scaling-up research or case studies are not due to lack of knowledge. Multiple case studies and research projects have demonstrated that protection, conservation, or restoration of degraded Arctic wetlands offers substantial benefits for water-centric ecosystem services, biodiversity, and climate change mitigation. In addition to Indigenous, institutional, and local knowledge of wetlands, there is a considerable and broad scientific knowledge base on wetlands protection, conservation, restoration, and management which dates back many decades. All of this knowledge is crucial for adaptive and holistic management of wetlands.

8. Improved public and policymaker understanding of wetland functions and vulnerability would likely foster greater interest in protecting and conserving Arctic wetlands and strengthen involvement in promoting sustainable wetland use. Yet, the ways in which public opinion and networks of interested commercial and civil society organizations influence the development and implementation of wetlands conservation,

Photo: Gustaf Hugelius

restoration and stewardship in the Arctic are poorly understood. Systematic knowledge of the array of interest organizations' relationships to wetlands and how they engage on questions of balancing conservation and use would support the development of more coherent and effective policies.

9. Policy inconsistencies and practical difficulties with implementation are obstacles in wetland management or restoration efforts. Goal conflicts or gaps in policies undermine successful implementation of good wetland management or restoration practices. Key challenges include: (i) inconsistencies or conflicts between different national-level policies or between national and sub-national policies, (ii) the organization of responsibility between multiple agencies with differing mandates, and (iii) challenges in ensuring effective coordination and communication between agencies and the public.

10. Substantial and rapid benefits for ecosystem services such as climate stability, biodiversity conservation and hydrological systems could be gained through restoration of drained or degraded Arctic peatlands. Degraded wetlands exist in all Arctic states and are particularly common in Boreal regions where extensive drainage for forestry, mining or peat extraction has occurred, or in Tundra where vulnerable permafrost wetlands have been degraded by unsustainable human land-use. Re-wetting of artificially drained or restoration of damaged wetlands could lead to substantial increases in natural carbon sink capacities. To achieve long-term success, restoration efforts should be planned together with conservation of undamaged systems as part of a landscape scale approach to sustainable management.

11. Coordinated transboundary management of wetlands is needed, but different national systems for wetland classification challenge such efforts. There are crucial differences between wetland classification systems. A uniform system for comparing and harmonizing existing Arctic wetland classifications would help to better plan wetland actions that span borders, traditions, and cultures. New developments should consider the value and legacy associated with existing national classification systems and Indigenous Knowledge and Local Knowledge of wetland areas. Development of new classification systems, maps and databases should ensure that legacy data remains useful, allow for conversion between systems and link to Indigenous Knowledge and use of wetlands.

12. There is a need for new pan-Arctic wetland maps based on a uniform approach, thus ensuring comparable accuracy and data quality across the full Arctic domain. Such mapping efforts should ideally train and validate algorithms using existing national wetland inventories, relevant institutional data, inclusive of Indigenous Knowledge and/or input from Arctic communities. Maps are needed that show the spatial extent of discrete wetland complexes at high resolution and should separate mineral wetlands from organic wetlands (peatlands). On the shorter term, new maps of wetland extent will be bound to one specific classification system; it is not possible to address the diversity of existing systems. Over the longer term, boundaries between maps and monitoring dissolve. Spatial wetland data can be stored in spatial databases that allow flexible adaptation to different classification systems.

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13. There are numerous models for providing financial support to conservation or restoration of wetlands. Each of the Arctic states has developed ways to provide financial support for wetlands conservation and restoration efforts. While some of the particular strengths and benefits of each set of policies, program or model are country context-specific, many lessons are generalizable and therefore useful for expanding collaboration across the Arctic states. A systematic review of these national-level restoration financing initiatives would provide valuable insights into development of effective tools.

POLICY RECOMMENDATIONS

These recommendations are designed to support decision-makers in understanding the diverse and valuable ecosystem services provided by Arctic wetlands and to identify specific actions they can implement to protect existing wetlands and restore those that have been degraded. The recommendations are directed to the Arctic Council as a whole. While some are intended to be implemented through CAFF, others may be led in full, or in part, by other Arctic Council working groups and other subsidiary bodies. Some recommendations will require action by national authorities, stakeholders, and international organizations. The recommendations are numbered and subdivided into separate themes which go from overarching policy to progressively more technical and practical recommendations.

Theme A: Climate change mitigation, wetland biodiversity, and resilience

Increased protection, conservation and restoration of degraded Arctic and Boreal wetlands would yield substantial benefits to ecosystem services, biodiversity, and climate mitigation.

1. Encourage Arctic cooperation to amplify efforts to reduce fossil fuel emissions both inside and outside the Arctic.

2. Actively support efforts to maintain or strengthen natural ecosystem capacity for climate change mitigation, primarily through conservation and restoration measures in Arctic and Boreal wetlands.

3. Initiate collaboration between Arctic states, Indigenous Peoples organisations and relevant stakeholders to harmonize how climate and biodiversity benefits reached through wetland management and restoration efforts are reported to international conventions on climate mitigation and biodiversity.

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Theme B: Wetland protection, conservation and restoration actions

Increased protection, conservation and restoration of degraded Arctic and Boreal wetlands would yield substantial benefits to ecosystem services, biodiversity, and climate mitigation.

4. Develop pan-Arctic inventory of protected wetlands and completed, ongoing or planned restoration projects, Indigenous led and partnership projects, with country cases contributed by each Arctic State and with the list to be managed by CAFF. Such cases can serve as pilot and demonstration projects for other rapid action.

5. Use short-lists of known northern wetland sites in need of protection, conservation or restoration to support national-level action plans. Such actions should be targeted to the most promising sites, including those that may be located outside the Arctic. Wetland protection, conservation and restoration would be more effective if done in direct collaboration with Indigenous Peoples, Local Communities and/or stakeholders and applied at the landscape level.

6. Develop a uniform inventory of degraded Arctic wetlands with potential for restoration. Many candidate sites for restoration are known, but the exact extent and location of other damaged or degraded wetland systems remains poorly known. Encourage Arctic states to identify data gaps where wetland extent and condition are unknown and can be prioritized for inventory.

Theme C: Streamline national wetland governance

Policy goals are more likely to be achieved when national policies consider all interlinked properties of wetlands; water management cannot be separated from land use management, fisheries, or green-house gas balance. Ensuring that conservation or development plans that affect wetlands are holistic and consider down-stream effects will improve outcomes and help avoid unintended consequences.

7. Inventory and review existing national policies relating to wetlands with an eye on using a watershed approach and identifying conflicting or inconsistent goals, overlapping or unclear responsibility among governmental departments and entities, and gaps in communication. Identifying and addressing these issues would enable more effective governance of wetlands and balancing conservation and Indigenous and other user needs to achieve more effective stewardship.

8. Ensure that national conservation or development plans that impact wetlands meaningfully engage Arctic communities, Indigenous Peoples, and stakeholders to consider the broader landscape impacts of changes to wetlands, including developments that may affect wetlands within river basins.

Theme D: Knowledge systems, meaningful engagement and communication and outreach of wetland management

Support multi-knowledge and multi-disciplinary approaches through meaningful partnership with Indigenous Peoples and/or local communities to support adaptive and holistic wetland management.

9. Wetland policy should recognize the legacy and future importance of Indigenous Peoples' stewardship and the need for collaborative, integrated management of Arctic wetlands. As outlined in the Arctic Wetlands and Indigenous Peoples Study, develop pilot studies onco-management practices to support meaningful participation of Indigenous Peoples in future Arctic wetlands projects, and encourage indigenous participation in developing wetlands inventories covering traditional use areas.

10. Develop and share between Arctic states outreach and communication strategies and tools to explain the values of wetlands, the threats to wetlands and provide examples of wetland restoration success stories. Material for the full Arctic region could be complemented with materials specific to knowledge from different geographic regions, communities, and Indigenous Peoples.

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11. Support research on how public opinion, in national, regional, local, and Indigenous communities as well as societal interests' policy and advocacy networks affect development and implementation of Arctic wetlands policy, restoration efforts, and management.

12. Strengthen wetland resilience through supporting meaningful engagement of Indigenous Peoples and/or Local Communities in wetlands inventories, and management plans.

Theme E: Wetland classification, mapping, and monitoring

Successful management of Arctic wetland resilience needs a common vocabulary. Existing wetland classification systems differ in many aspects and do not properly acknowledge indigenous wetland use or Indigenous Knowledge.

13. Develop a tool for translating between existing national and international wetland classifications systems, identify where there is presently no way to translate between systems and explore potential benefits of developing unified Arctic and Boreal wetland classification systems.

14. Support development of wetland classification systems and maps specific to different Arctic Indigenous Peoples based on the words and terms traditionally used to describe wetland types, properties, and functions. Such maps would support wetland stewardship and facilitate communication of their value locally and to policy makers.

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15. Support the ongoing work with the Arctic SDI to develop a pan-Arctic wetland map making use of modern remote sensing and data processing methods but supported by existing national and local data and inventories. Work with individual nations on a plan for incorporating this product into their national systems.

16. Support long-term development of open-access spatial databases for wetland data that allow interactive use, application of different classification systems and on-the-fly wetland map production.

Theme F: Coordination of Arctic wetland actions, research, and monitoring

There is much knowledge on Arctic wetlands. To gain more societal benefit of this existing but dispersed knowledge, improved coordination of Arctic wetlands research is needed. Wetland monitoring programs are needed to ensure long-term social-ecological resilience.

17. Encourage collaboration among Arctic States and with organizations representing Arctic Indigenous Peoples, to develop and refine approaches for reporting on the benefits of wetlands restoration to improvements in ecosystem services, in particular: livelihoods, food security, biodiversity, and climate change mitigation.

18. Inventory, harmonize and pool knowledge about financial models and frameworks being used to support restoration and conservation and investigate potential pan-Arctic or trans-boundary initiatives, with a particular focus on engagement by local and Indigenous Peoples.

19. Support national and international evaluation and coordination of wetland inventory, research and monitoring programs as well as encouraging and strengthening interdisciplinary and transdisciplinary wetland research, Indigenous Knowledge, and citizen science within Arctic research networks.

20. Integrate wetland monitoring with CAFF CBMP monitoring where possible, with the CBMP Terrestrial, Coastal and Freshwater monitoring plans.

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