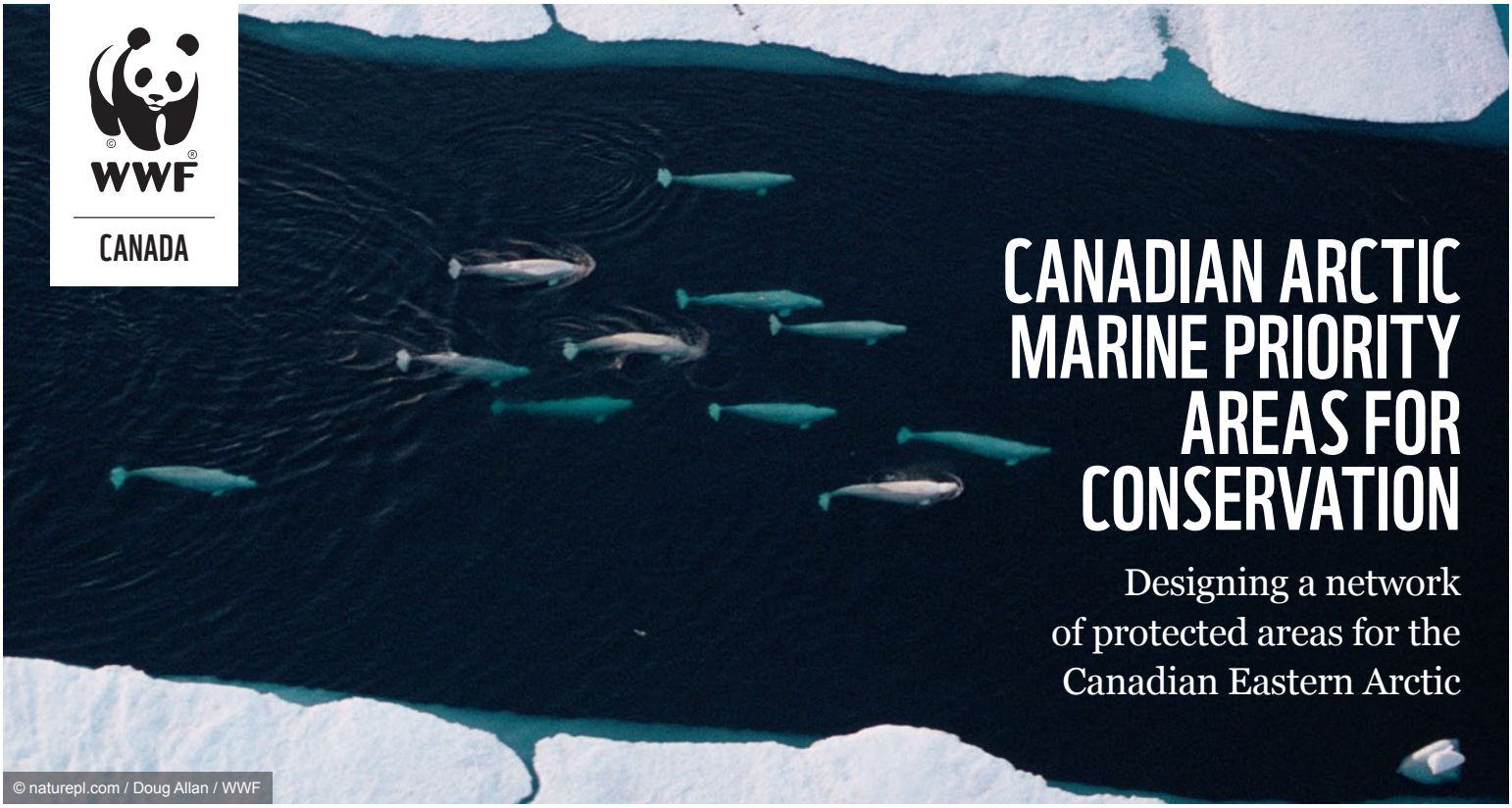


A network of Marine Protected Areas in the Arctic

In the face of an ongoing climate crisis, protecting important areas in the Arctic marine environment is of the utmost concern. Arctic waters moderate the global climate, support unique marine biodiversity and ecological services, and are inextricably linked to day-to-day life for Inuit communities. With the Arctic warming three times as fast as the global average, losses in Arctic sea ice will affect local communities, coastal infrastructure and ecosystems along with important regional and global climatic feedback mechanisms.

Network planning can help achieve broader conservation objectives than can be done by establishing stand-alone Marine Protected Areas (MPAs). Connectivity and networks are important for marine conservation because many species are on the move, whether actively or carried by ocean currents. A stand-alone MPA can only capture a snapshot of the diversity of species and habitats, and the interconnections between them. Networks can holistically capture and protect the integrity of these dynamic ecosystems.

> This project shows how Canada can take the first steps toward network planning as it works to reach its international commitment to **protect 30 per cent of Canadian waters by 2030**.

To date, Canada has protected 13.8 per cent of its marine areas — in the Arctic, 15 per cent of marine and coastal areas are provisionally or fully protected, including Tuvaijuittuq Marine Protected Area and Tallurutiup Imanga National Marine Conservation Area. While these area-based protections are impressive, many of the existing protected sites have been selected without an overarching regional conservation strategy, which means they are, for the most part, pockets of refuge. As Canada starts to identify new areas for protection to meet international targets for marine protection (30 per cent by 2030), it is critical to select sites that function as part of a network, contributing to long-term ecosystem health and resilience across Canada's Arctic waters.

MARINE PROTECTED AREAS

The term **Marine Protected Areas (MPAs)** is used here to refer to a range of area-based protections in the marine environment, including MPAs designated under the Oceans Act, National Wildlife Areas, National Marine Conservation Areas, and Indigenous Protected and Conserved Areas, among others.

Designing and implementing an MPA network requires commitment from diverse stakeholders and the integration of Indigenous knowledge and leadership, socioeconomic considerations, and ecological information. WWF-Canada's **Canadian Arctic Marine Priority Areas for Conservation** (CanPAC) project is a decision support tool that focuses on the ecological aspect of MPA network planning. CanPAC is the first analysis of its kind in the Canadian Eastern Arctic — a systematic conservation planning approach that brought together diverse partners and data/information. It has the potential to inform future marine conservation and regional planning — such as marine spatial planning and ecosystem-based management — by identifying key components of marine biodiversity. It also highlights how locally identified priorities for protected areas can function as part of a broader protected areas network.

Our work: CanPAC

WWF-Canada worked with regional and national experts, analyzing existing and available scientific and Indigenous knowledge (such as the Government of Nunavut's Nunavut Coastal Resource Inventory) to develop a resource to support marine planning in the Eastern Canadian Arctic. This required compiling an unprecedented amount of information in this region from a wide range of sources. The outcome includes an inventory of data for the region that is important for identifying a network of Priority Areas for Conservation (PACs) in four of the five Canadian Arctic marine bioregions[1] — an area covering 3,048,130 km, stretching from the northernmost marine areas of Canada to the southernmost point of James Bay – larger than British Columbia, Alberta, Saskatchewan and Manitoba combined.

The scope of this project relied on publicly available data and information only, and did not include any primary research. A vital step in future marine planning processes will be community engagement and consultation on priority setting.

Priority Areas for Conservation are areas of the marine environment that have proven biodiversity value and should be prioritized for future conservation efforts.

To develop the PAC network designs, we selected more than 500 conservation features that would contribute to the following three conservation objectives:

1. To protect distinctive, unique, rare or endangered species and ecological features including:
    A. Key habitats of Arctic priority species (e.g., polar bears, narwhals, belugas);
    B. Ecologically sensitive areas (e.g., coral and sponge concentrations); and
    C. Areas of high productivity (e.g., polynyas) and high species diversity/concentrations.

2. To protect representative examples of identified ecosystems and habitat types to ensure various Arctic species will find ideal habitat conditions within the network.

3. To ensure that the PACs are integrated into the wider landscape and seascape by patterns of connectivity.

The Analysis

Using a conservation planning tool called Marxan, we mapped more than 500 different conservation features to identify networks of protected areas. Marxan is a flexible tool that can be modified to reflect different objectives. The maps reflect the objectives we selected for our analysis based on our focus on the ecological aspect of network planning. They should not be interpreted as a proposal for a set of Arctic MPAs, but rather as a tool to consider in Arctic marine planning alongside additional engagement with Inuit and stakeholders.

In this analysis, each individual conservation feature is assigned a target range that indicates how much of the feature should be captured by the network design based on the characteristics of each feature. For example, corals are known to occur in very small and specific areas of this region. They are also highly sensitive to disturbance and recover very slowly because of their growth rates. Based on the advice of coral scientists, we set a target of 80–100 per cent of coral concentrations.

We followed a similar process for each conservation feature. As a starting point, we assessed how well the existing set of protected areas in this area met these targets and found that even taking the lower end of the target range, existing protected areas only meet 19.1 per cent of these targets.

Three Scenarios

Using targets from the bottom, middle and top of each target range, we identified three network designs: the minimum-, median- and high-protection scenarios. By comparison to the existing protected areas, each of these scenarios meets more than 90 per cent of the assigned conservation targets. The set of network designs provides flexibility to governments, rightsholders and other stakeholders when considering how to best achieve regional conservation goals.

Across the three scenarios, there is a shift from the minimum-protection scenario's network of many smaller PACs (75 PACs covering 31 per cent of the area) to the high-protection scenario's network of fewer, larger PACs (44 PACs covering 47 per cent of the area). As the higher targets lead to a network that captures a greater total area, the small PACs that appear in the minimum- and median-protection scenarios tend to amalgamate into a network consisting of fewer PACs overall, but ones which are larger in area.

All three scenarios are designed to include existing protected areas to ensure that future conservation efforts build on protections that are already in place. Additional analyses of these results show considerable synergy with areas that are important to local Arctic communities.

PAC consistency across scenarios

Certain areas of the eastern Arctic are highlighted across all scenarios, captured in PACs that may vary in size but serve as a guide to areas that are regionally important and can contribute to a conservation network. They appear consistently throughout scenarios because they capture important areas for a wide variety of conservation features across the board (varying from seafloor habitat to polar bear denning areas), which makes them key areas for network planning moving forward.

For example, around Southampton Island, the minimum scenario shows three PACs (one large one and two smaller ones) within the region under consideration for a future MPA (indicated with green hashmarks on the maps). In the median scenario, the PACs are larger; in the maximum scenario two smaller PACs merge into one on the southwest side of the island, and the larger one on the northwestern side stretching across to Baffin Island expands.

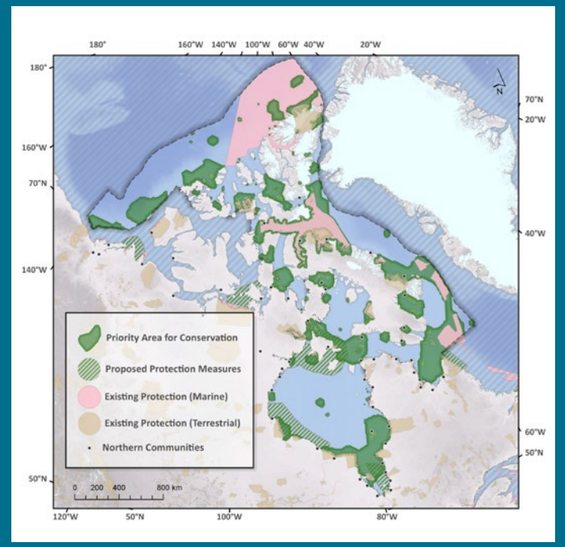
The consistency of these PACs across all three scenarios indicates the enduring conservation value of the region around Southampton Island. They show that this area can function not only as a standalone MPA, but as a key part of a future network of protected areas.

The same thing is observed in other areas such as Foxe Basin, southern Hudson Bay and James Bay, and Cumberland Sound.

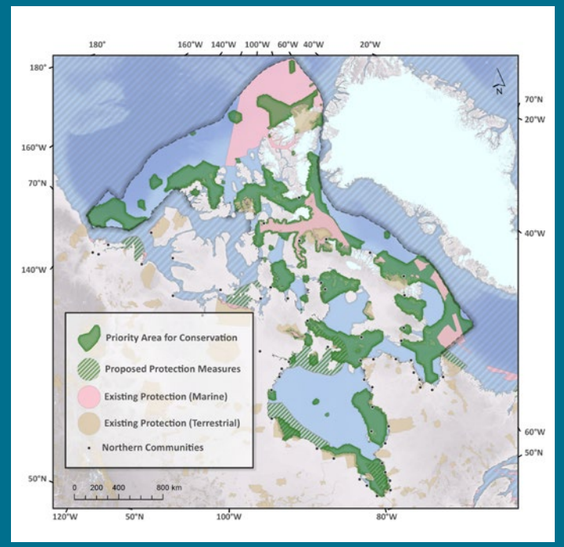
Priority Areas for Conservation and Local Use Areas

A network of marine protected areas must also have positive impacts on community well-being and development. As a starting point to addressing this dimension of marine

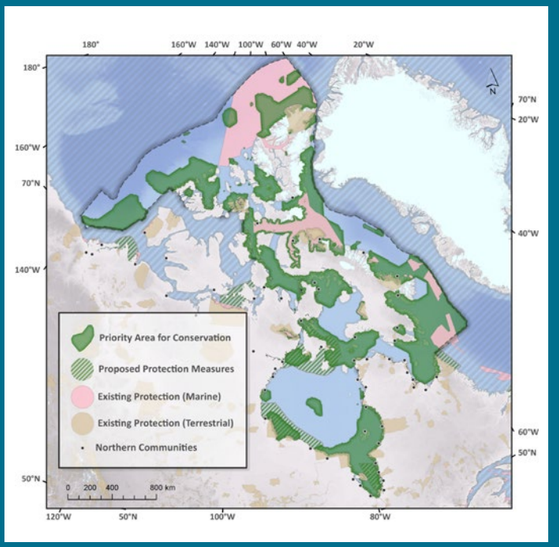
CanPAC SCENARIOS



The minimum scenario includes 75 distinct PACs that cover 31 per cent of the study area.

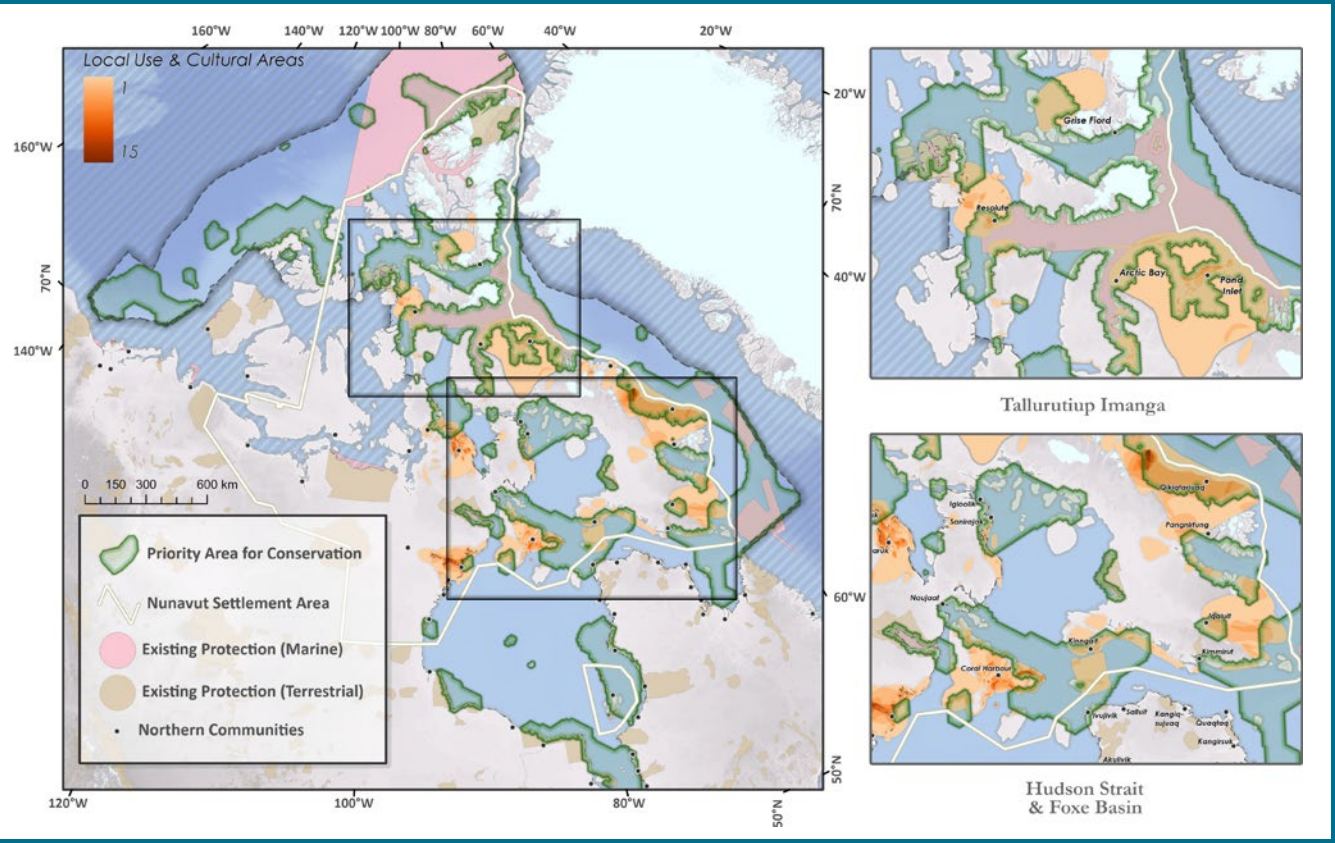


The median scenario includes 45 distinct PACs that cover 39 per cent of the study area.



The high scenario includes 44 distinct PACs that cover 47 per cent of the study area.

1 These include the Arctic Basin, Arctic Archipelago, Eastern Arctic, and Hudson Bay Complex Bioregions. The Western Arctic Bioregion was excluded due to coverage from another planning process. For more information, please see CanPAC Technical Report.



Overlap between the PACs of the median-target scenario and NCRI Nunavut Inuit use areas.
NCRI Nunavut Inuit use areas indicated in orange.

planning, we looked at how CanPAC scenarios overlapped with areas identified as important for a variety of local uses in the Nunavut Coastal Resource Inventory. The results show that 63 per cent of these Inuit use areas coincide with the median-scenario PACs. Guidance from local communities and Indigenous leadership on how conservation can support local needs and priorities is essential to advancing conservation of the PACs. Direct engagement with interested communities to identify how CanPAC can support local level initiatives is one of the next steps in this work.

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The data used in this study, including shapefiles and inventories of conservation features for each PAC, is available from WWF-Canada upon request. More information is available in *Marine Ecological Conservation for the Canadian Eastern Arctic — Technical Report and Canadian Arctic Marine Priority Areas for Conservation* — CanPAC Technical Report

Considerations for a Future Arctic Marine Planning Process

Based on this knowledge and the findings of CanPAC, WWF-Canada proposes that:

1. The Government of Canada should work with Indigenous Peoples and key stakeholders to develop an MPA network in the Canadian Arctic and begin Marine Spatial Planning to enable Integrated Oceans Management

2. A "toolbox" of marine conservation and management measures should be used for MPA network implementation, including:
    - Federal, provincial and territorial legislation
    - Indigenous Protected and Conserved Areas (IPCAs)
    - Other Effective Area-Based Conservation Measures (OEABCMs)

3. A stepwise approach to marine conservation should be adopted, beginning with the 30 per cent minimum target by 2030, and increasing to 50 per cent by 2050.

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