



PAME's MPA network toolbox through a resilience lens

Martin Sommerkorn
WWF Arctic Programme

Photo J.P. Macdonald

A Pan-Arctic MPA network in support of social-ecological resilience



“An ecologically connected, representative and effectively-managed network of protected and specially managed areas that protects and promotes the resilience of the biological diversity, ecological processes and cultural heritage of the Arctic marine environment, and the social and economic benefits they provide to present and future generations.”

- Insurance value of natural capital
 - Nature for and with people
 - Systematic approach at biome scale
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PAME's toolbox project

- guidance to assist Arctic states in advancing their MPA networks.
 - providing theory and tools to protect the diversity of genes, species, populations, habitats, features, and ecosystems; their interactions and processes; and the capacity to adapt to change.
 - fostering collaboration for a systematic and participatory approach to MPA network development between Arctic countries, Permanent Participants, Arctic Council Working Groups, and the conservation and science communities.
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Networked Area-based Measures to support structure, function, and feedbacks

- Measures that are mutually supportive and integrated in the management of the wider seascape can deliver more benefits than unconnected individual MPAs.
 - Measures focused on
 - sustaining key ecological features (e.g. species, habitats, ecologically and biologically significant areas, geophysical features, landscapes),
 - ecological processes and services,
 - cultural values.
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Networked Area-based Measures to support structure, function, and feedbacks

- Measures that are mutually supportive and integrated in the management of the wider seascape can deliver more benefits than unconnected individual MPAs.
 - Ecological coherence criteria describe characteristics of a network:
 - Representativity of features,
 - Adequacy of measure size, placement, replication, and management,
 - Connectivity for life stages of species.
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Networked Area-based Measures to support structure, function, and feedbacks

Measures focused on

- sustaining key ecological features (e.g. species, habitats, ecologically and biologically significant areas, geophysical features, landscapes),
 - ecological processes and services,
 - cultural values.
 - Places where important interactions take place, protecting system feedbacks
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Networked Area-based Measures to support adaptive capacities

Measures focused on providing space to function and adapt, while reducing other pressures; places with

- High structural, functional, spatial, and phylogenetic diversity and redundancy
 - High species richness
 - High functional redundancy
 - High response diversity
 - High modularity
 - Habitats for species of concern
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Benefits of “other measures” for supporting resilience

- Dynamic protection (not tied to a permanently fixed geographic space) as species move, geographic ranges change, where different locations may shift in importance or condition through time.
 - Banning or limiting specific threats or pressures during a critical period of time for biodiversity (e.g. in a species' life cycle, for a particular habitat, for an emerging or seasonal pressure).
 - Safeguarding biodiversity, places, or ecosystem services in a precautionary approach, e.g. to for ecosystem services supporting economic options.
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Benefits of “other measures” for supporting resilience

Including places where conservation is an outcome, rather than the primary objective of management efforts

- Indigenous and local community efforts linked to livelihood and culture maintain or strengthen ecosystem functions and valued services essential to sustainable livelihoods, food security, human wellbeing, and/or other cultural and spiritual aspects of resilient communities.
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Networked Area-based Measures to protect Biodiversity on the Move

- Dynamic ecological features
 - Difficulty to protect through fixed measures across their dynamic range
 - Range shifts
 - Protecting populations, pathways, “new” habitat from additional pressures to bolster adaptive capacity
 - Ecological linkages
 - Protecting crucial linkages for migratory species, mobile life-stages that provide conditions for foodwebs and processes
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Networked Area-based Measures to support adaptive capacities

Protecting Connectivity – 4 steps for integration

- Identify connections for species with planktonic life history phases
 - ensuring protected areas are spaced taking into account biological and oceanographic characteristics of larval dispersal (fish, invertebrates)
 - Identify Connections for Active Swimmers and Flyers
 - combination of direct observations of migration and genetic information on population structure is likely to be most informative
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Thank you!