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KEY FINDINGS ON ARCTIC BIODIVERSITY MONITORING

A new spatial analysis from the Arctic Species Trend Index (ASTI) used data from 366 sites across the Arctic to draw recommendations to assist circumpolar biodiversity monitoring efforts. The findings were released in a report from the Circumpolar Biodiversity Monitoring Program (CBMP), the cornerstone program of the Conservation of Arctic Flora and Fauna (CAFF), the Arctic Council's biodiversity working group.

The spatial distribution and quality of biodiversity monitoring across the Arctic was evaluated for use in identifying critical gaps in monitoring coverage. Maps produced in the report provide information useful for identifying gaps and setting priorities for biodiversity monitoring programs.

Northern Scandinavia, Iceland, and the Bering Sea and Aleutian Islands have had more monitoring coverage, while northern Russia, northern Greenland and the islands in the Canadian High Arctic have had relatively sparse monitoring coverage since the 1950s, according to the report. However, this discrepancy could be due to an inability to secure data from some regions, rather than an accurate account of monitoring coverage. It is also likely reflective of the challenge of conducting monitoring in remote and extreme environments. Monitoring across the Arctic increased until 2000 then declined. This might reflect a delay in reporting time, reductions in biodiversity monitoring, or a combination of both, says the report.

"This type of spatial analysis at the scale of the ASTI hasn't been widely applied in biodiversity monitoring" says Mike Gill, Chair of the CBMP. "This information is useful in guiding more efficient and effective Arctic monitoring programs and to better inform policy."

The benefit of spatial analysis not only comes in identifying gaps in coverage, but also in helping to improve our understanding of the key drivers of change in Arctic biodiversity, says the ASTI authors. This round of ASTI analysis tested a model that explored biodiversity's relationship to air temperature, human density and land cover. Those variables were found to only explain a small amount of change (5-11%), which indicates that analysis of other variables is needed to explain trends in Arctic vertebrate abundance.

"This is exactly the type of information that we need to know: where do we have the most confidence in our data, what areas and species need more coverage and where should we focus our efforts," says Tom Barry, Executive Secretary of CAFF. "This can help circumpolar scientists and community based monitoring groups to provide the missing information."

RECOMMENDATIONS:

- Data collection efforts should focus on areas where data is currently sparse, especially where there are declining trends.
- Sites that monitor single species should expand to focus on multiple species when feasible. This will be able to help identify whether trends are common across species and populations.



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- Areas that are more sporadically monitored, especially where there are declining populations, should be more frequently monitored, which will help quickly distinguish between naturally occurring changes and actual population reductions.
- Monitoring efforts for vertebrate species should also include monitoring of non-biological measures to help improve understanding of the drivers of vertebrate species trends.
- Extensive and complete regional data, from areas like the Bering Sea and northern Scandinavia, improve understanding of local factors that exert pressures on biodiversity. This data should be further analysed.
- Measures to encourage consistent and timely reporting of monitoring results improve the capacity of ASTI to provide up-to-date information and detect emerging changes.
- Work is needed to define key drivers behind biodiversity change, such as habitat fragmentation, impacts of climate change on habitats, and harvest, and to develop and access data sets for these drivers. This will help the ASTI better construct predictive models that explore relationships between biodiversity and these potential drivers.

The ASTI contains information on 890 populations of 323 species of Arctic vertebrates. The ASTI allows scientists to track broad trends in the Arctic's living resources and identify potential causes of changes, whether they are responses to natural phenomena or human-induced stressors. These recent ASTI analyses were a collaborative effort between the CBMP, the Zoological Society of London, and the World Wildlife Fund. Further information can be found at www.asti.is.

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