

# Key Messages. From the Arctic Biodiversity Trends - 2010: selected indicators of change report.

2009

## Conservation of Arctic Flora and Fauna (CAFF)

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## Key Messages

### ***From the Arctic Biodiversity Trends - 2010: selected indicators of change report***

In 2008 the United Nations Environment Program passed a resolution expressing ‘extreme concern’ over the impacts of climate change on Arctic indigenous people, other communities, and biodiversity.<sup>1</sup> They highlighted the potentially significant consequences of changes in the Arctic. The *Arctic Biodiversity Trends - 2010: selected indicators of change* report provides evidence that some of those anticipated impacts on Arctic biodiversity already are occurring. And that although climate change is a pervasive stressor, multiple stressors, such as long range transport of contaminants, harvesting and resource development are also impacting Arctic biodiversity. These key messages include a selection of indicators but not a complete overview.

#### **1. Unique Arctic habitats to flora and animals, including sea-ice, tundra, ponds and lakes, have been disappearing over recent decades.**

The Arctic food web which is dependent on sea-ice and is biologically productive includes many unique species. Sea-ice is being lost at a faster rate than predicted by the most pessimistic of climate change scenarios. Early warning signs of loss of the sea-ice web of life include declines in some sea-ice dependent species such as Ivory Gull and Polar Bears.

The plant communities that make up the tundra vegetation – various species of grasses, sedges, mosses, and lichens - are in some places being replaced by those more typical of southerly locations, such as evergreen shrubs. Trees are beginning to encroach on tundra’s and some models predict that by 2100 the tree

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<sup>1</sup> UNEP, 2008: United Nations Environment Program Governing Council decision SS.X/2 on Sustainable development of the Arctic region

line will have advanced north by as much as 500 km, resulting in a loss of 51% of the tundra habitat. Depending on the magnitude of change, the resulting ecosystems may no longer be considered “Arctic”, and a great many of the species that now thrive will not be those currently living in the Arctic.

Thermokarst lakes<sup>2</sup> and ponds are the most abundant and productive aquatic ecosystems in the Arctic. Drainage and appearance of thermokarst lakes is a relatively common occurrence. However, over the past 50 to 60 years, studies have shown a net loss of thermokarst lakes in some places such as Siberia, Alaska and western Canada.

**2. Although the majority of Arctic species are not currently declining, some harvested species of importance to Arctic people or of global significance have reached low levels.**

Wild Reindeer and Caribou herds have declined by about a third, from 5.6 to 3.8 million, since the 1990s and early 2000s respectively. While this may be a result of naturally occurring cycles, the ability of these populations to rebound is uncertain, given the multiple stressors to which they are now exposed. These mammal species are very important to the livelihood of Arctic peoples.

Although much is known, information is deficient on many species and the relationship to their habitat. Even for charismatic animals such as the Polar Bear, trends are known for only 12 of 19 sub-populations and half of these are declining.

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<sup>2</sup> Thermokarst lakes and ponds are formed by the thawing of permafrost,

Arctic shorebirds, such as Red Knot, migrate long distances to breed in the Arctic. Half of the 6 subspecies of this species are declining and the other subspecies are either suspected of being in decline or their status is unknown. The evidence indicates that shorebird populations are declining globally.

The Arctic Species Trend Index (ASTI), which provides a snapshot of vertebrate population trends over the past 35 years, shows a moderate 10% overall decline in terrestrial vertebrates. The decline partially reflects declining numbers of some herbivores, such as Caribou and lemmings, in the High Arctic. In the Low Arctic vertebrate populations have increased, driven by dramatically increasing populations of some goose species, which have now exceeded the carrying capacity of the environment to support them.

Populations of some very abundant seabirds, such as Common Eiders, are generally healthy. Some Arctic seabird populations such as murrelets may be showing divergent trends. Their populations fluctuate in relation to major climate regimes in the Northern hemisphere. Freshwater Arctic Char populations appear to be healthy in comparison to those in more southern locations.

- 3. Accelerated climate change is emerging as the most far reaching significant stressor on Arctic biodiversity. However, contaminants, habitat fragmentation, and harvest levels continue to have impacts. Complex interactions between climate change and other impact factors have the potential to magnify their effects.**

The life cycles of many Arctic species are synchronized with the onset of spring and summer to take advantage of peaks in seasonal productivity. Earlier melting of ice and snow, flowering of plants, and emergence of invertebrates can cause a mismatch between the timing of reproduction and food availability. In addition, warming sea temperatures in some areas has led to a northward shift in the

distribution of marine species, such as some fish species and their copepod prey. These changes have been implicated in massive breeding failures for some seabirds, and eventual population declines.

Arctic biodiversity is impacted by factors outside the Arctic, including the long range transport of contaminants through air and water, habitat changes along migratory pathways, and invasive species, both introduced and naturally occurring. Increasing contaminant loads have been documented in some Polar Bear sub-populations, possibly as a result of dietary shifts due to declining sea-ice. Red Knots are highly dependent upon a limited number of key stopover and wintering sites making them vulnerable to habitat changes occurring outside of the Arctic.

Although changes to Arctic biodiversity are presenting challenges for Arctic peoples, new opportunities are also arising with respect to the availability of species that traditionally have not been harvested.

**4. Over the past 10 years the extent of land areas protected has increased while marine areas remain poorly represented.**

Protected areas ensure that the biodiversity within them is protected from anthropogenic pressures. However, due to the shifting of biodiversity distributions the effectiveness of current protected area boundaries in a warming Arctic is uncertain. This fact inevitably also calls for much stronger attention to environmental conservation outside protected areas.

**5. Changes in Arctic biodiversity are creating both challenges and opportunities for Arctic peoples. The rapid pace of change calls for long-term monitoring to assist in better decision-making.**

Changes to Arctic biodiversity include shifting habitats, the emergence of new and invasive species and possible changes in resource use. The Circumpolar Biodiversity Monitoring Program (CBMP), which includes both scientific, Traditional Ecological Knowledge and community-based monitoring approaches, is being developed by the Conservation of Arctic Flora and Fauna (CAFF) working group of the Arctic Council, to address these urgent needs for monitoring. As recognized by the 2004 Arctic Climate Impact Assessment (ACIA), long term monitoring would greatly help facilitate early warning signals and adaptation strategies.

Arctic languages are facing an uncertain future. Seventeen languages have become extinct since the 1800s and 11 of these extinctions have taken place after 1989 indicating the rate is increasing. Important historical knowledge of biodiversity and its uses is being lost along with these languages.

Governance of polar areas is receiving increasing attention and taking care of the environment constitutes one of the major challenges, facing the Arctic Council and all other stakeholders interested in the north.