
A STRATEGY FOR COORDINATION OF MONITORING ACTIVITIES BETWEEN CAFF AND AMAP

SUPPORTING PUBLICATION TO THE
CIRCUMPOLAR BIODIVERSITY MONITORING PROGRAM
FRAMEWORK DOCUMENT



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**Conservation of Arctic Flora and Fauna
and
Arctic Monitoring and Assessment Programme
Working Groups of the Arctic Council
present**

A Strategy for Coordination of
Monitoring Activities between CAFF and AMAP

Supporting publication to the
Circumpolar Biodiversity Monitoring Program
Framework Document

CAFF CBMP Report No. 3

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AMAP
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1.0 Introduction

Environmental monitoring - defined as regular, long-term measurements of selected elements of flora and fauna, their habitats and ecosystems, and the physical environment - has long been recognized as essential for conservation of the global environment. Monitoring has been identified as an important component in the work of the Arctic Council (AC).

The AC responsibility for leading monitoring programs is shared between two of its working groups – Conservation for Arctic Flora and Fauna (CAFF) for biodiversity monitoring; and Arctic Monitoring and Assessment Program (AMAP) for contaminants and human health monitoring. Both programs have vested interests in the biological effects of various impact factors, including climate change.

Discussions at the ministerial level have highlighted the need to ensure synergies between the monitoring efforts of CAFF and AMAP. In the report of the Senior Arctic Officials (SAOs) at the 2002 Inari Ministerial, it was stated:

“to request AMAP and CAFF to prepare a coordinated common monitoring program and present it for endorsement by the SAOs by the end of 2003.” and further:

“to encourage CAFF, in cooperation with AMAP, to enhance monitoring of biodiversity at the circumpolar and regional levels to detect the impacts of global changes and to allow Arctic communities to respond and adapt.”

In the Inari Declaration of 2002, the Ministers endorsed CAFF's *Arctic Flora and Fauna Recommendations for Conservation*; and directed CAFF to develop a Circumpolar Biodiversity

Monitoring Program (CBMP). The Ministers also referred to cooperative efforts for monitoring between CAFF and AMAP. Lastly, both programs are expected to respond to the findings in the *Arctic Climate Impact Assessment (ACIA) Scientific Report (2004)*, including monitoring needs.

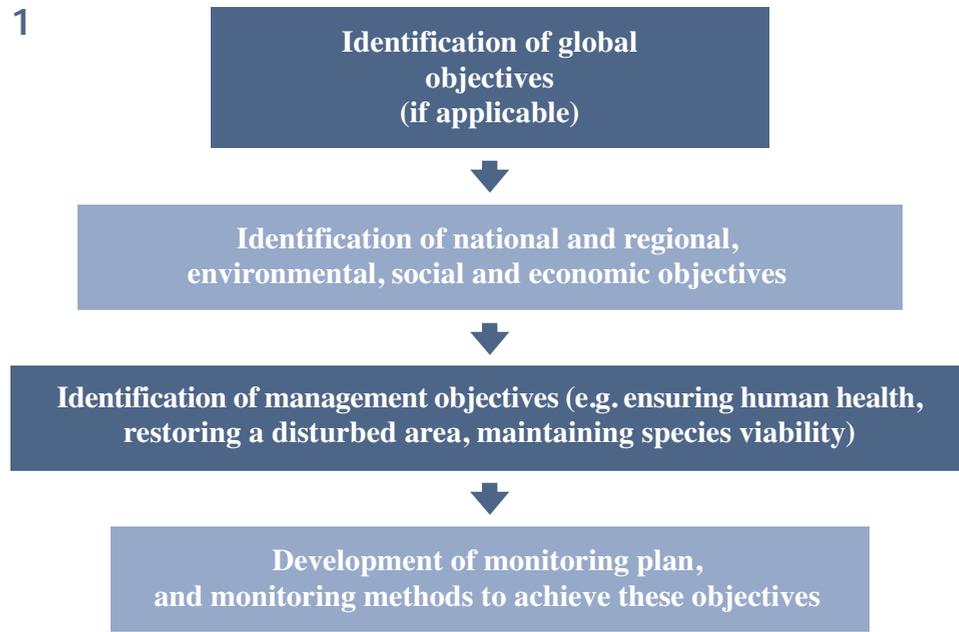
The priority issues, scope, objectives, and methods of the CAFF and AMAP monitoring programs overlap in certain specific ways. In this paper, the key strengths of each monitoring program, the commonalities between the programs, and potential synergies are presented. This paper concludes with recommendations for action.

2.0 Background

National programs comprise the core of monitoring activities in the circumpolar countries. It is not feasible to regularly measure all components of the Arctic environment, so key components or indicators need to be selected. Indicator and site selection are dependent on monitoring objectives, which are issue-driven at the global, national, regional, and local/management levels. The definition of which components and variables to measure and on which spatial and temporal scales are directly dependent on the multi-level objectives to be achieved. See Figure 1.

Priority issues of AMAP monitoring activities include the levels and trends of specific contaminants (hydrocarbons, PAH, heavy metals, POPs, radioactivity, etc.) suspended in the physical environment or carried in the tissues of organisms. Other AMAP priority issues include the environmental consequences and effects of global climate change, stratospheric ozone depletion, the effects of pollution on human health, and the combined effects of pollutants and other stressors on ecosystem components and humans.

Figure 1



CAFF's Circumpolar Biodiversity Monitoring Program (CBMP) focuses on monitoring species, their habitats and ecosystems e.g. population sizes and distributions; reproductive health; food web and ecosystem integrity - including marine, terrestrial, coastal and freshwater; migration patterns; and assessment of the effects of climate change and other impacts. This type of monitoring provides an overall view on the status and trends of species that live and breed in the Arctic, on temporal and spatial scales. The details of the CBMP are outlined in the CBMP Framework Document.

CAFF's CBMP flows from the recommendations in the CAFF Strategic Plan, results from the ACIA report, and numerous international conventions which call for monitoring of Arctic biodiversity, such as the Convention on Biological Diversity and the target of significantly reducing the rate of biodiversity loss by 2010, a key CAFF goal in the Arctic. In addition, this program supports other initiatives within the AC, such as those of the AC Working Group *Protection of the Arctic Marine Environment* (PAME) program, and the Arctic Council's Arctic Marine Strategic Plan.

The formation of the CBMP is in harmony with international agreements and conventions to protect biodiversity, and the responsibility to provide information which supports policymakers in their efforts to promote sustainable use of the Arctic's living resources. An important aspect of the CAFF monitoring program relates to economics and sustainable use. The CBMP therefore incorporates monitoring for economic purposes, such as fisheries interests and harvest statistics, as well as non-economic monitoring, related to general environmental health and ecosystem integrity.

CAFF and AMAP have an on-going cooperation with the International Arctic Science Committee (IASC) on ACIA. As specified in the Barrow Declaration of 2000, the goal of ACIA is to "evaluate and synthesize knowledge on climate variability and change and increased ultraviolet radiation, and support policy-making processes and the work of the Intergovernmental Panel

on Climate Change.” Key findings of the ACIA report state that the Arctic is now experiencing some of the most rapid and severe climate change on earth. Over the next 100 years, climate change is expected to accelerate, contributing to major physical, ecological, social and economic changes, many of which have already begun. The ACIA assessment addresses “environmental, human health, social, cultural and economic impacts and consequences, including policy recommendations”. There is a broad overlap between the ACIA process and the CAFF and AMAP monitoring programs, further emphasizing the importance of efficient collaboration between the two working groups.

3.0 Monitoring Strategies

3.1 AMAP Monitoring Strategies

AMAP monitoring activities are based, to the greatest extent possible, on ongoing national and international monitoring and research, aiming to harmonize this work and (where necessary) promote new activities to fill identified gaps in order to meet the AMAP objectives. AMAP activities focus on the following priorities:

Contaminant levels, trends and effects in human populations and in the environment

- to monitor the temporal trends and levels of prioritised contaminants (persistent organic pollutants, heavy metals, radioactivity, acidification, hydrocarbons, etc.);
- to determine more fully the geographic distribution and magnitude of contaminant levels on a circumpolar basis;
- to clarify the adverse effects of priority contaminants on human populations, especially on child development;

- to monitor and identify chemical and biological effects on Arctic flora and fauna;
- to identify new contaminants that may pose a cause for concern in the Arctic.

Impacts of climate change and UV radiation

- to monitor and assess impacts of climate change and UV radiation in the Arctic, including their effects on Arctic ecosystems and human health.

Source-receptor relationships

- to quantify and assess the significance of the different contaminant sources and contaminant pathways to and within the Arctic.

Human health

- to improve the knowledge needed to protect and promote the health of Northern peoples with respect to their exposure to environmental contaminants.

Communication of information

- to communicate results in an appropriate and responsible manner to the Arctic Council, relevant international fora, and the Arctic people.

The AMAP programmes are implemented largely through National Implementation Plans. The methods that should be applied in sample collection, pretreatment or analysis are not prescribed in detail. Rather, recommendations and references to internationally accepted methods and guidelines are listed, including those developed under AMAP. Harmonisation between AMAP and other international programmes with respect to methodologies is an ongoing process.

3.2 CAFF Monitoring Strategies

At the circumpolar level, CAFF supports a network of monitoring programs. CAFF's shared monitoring activities are generally based on national programs. The current networks are seabirds, ITEX (*International Tundra Experiment*), Arctic Char, Caribou/Reindeer, and Shorebirds/Waders. These networks are the first of many monitoring networks which will be coordinating efforts with the CBMP. From the beginning, these networks were only considered to be the very first steps towards a more fully developed monitoring program. CAFF's current efforts are directed at identifying and bringing together comparable on-going monitoring programs at the circumpolar level, sharing of collective information, encouraging common analyses, and identifying and encouraging the filling of gaps in monitoring activities.

Much monitoring for biodiversity is already being carried out nationally in the Arctic countries. However, to date there has been limited circumpolar coordination, which would lead to better understanding of many biodiversity issues, more extensive use of existing information, and better use of available logistical and financial resources. To achieve a circumpolar understanding of Arctic biodiversity requires coordinated, international efforts rather than national approaches alone, in particular the issues of climate change and seasonal migrations.

CAFF's CBMP will enhance information sharing and the overall cooperation between the AC Member States, Permanent Participants, Working Groups, Observers, scientific communities within and beyond the Arctic, and the Arctic people. The CBMP encourages cooperation between CAFF and other AC Working Groups, in particular, the coordination of monitoring

strategies with AMAP, although the scope of the CBMP program is much broader than these shared efforts.

The CBMP has the following principal objectives:

- Detect changes and causes of change in Arctic biodiversity.
- Provide an early warning system, which could trigger more specific research and conservation measures.
- Contribute to the development and evaluation of national and circumpolar conservation programs, policies, and measures.
- Support the sustainable use of the Arctic's living resources.
- Provide for the timely and cost-effective sharing of information.
- Increase the understanding of Arctic biodiversity, and its interaction with regional and global processes.
- Cooperate with other AC Working Groups and other parties within and outside the Arctic. In particular, coordinate monitoring efforts between CAFF and AMAP.

3.3 Similarities in Monitoring Strategies

A collaborative and coordinated Arctic CAFF/AMAP monitoring approach would have the following major components in common:

Compartments

Measurements in the biotic, human and physical components in order to define status and trends.

Strategic elements

Species (selected indicator fauna and flora), sites (selected sites across ecosystems, protected areas, biologically sensitive sites and other key areas), and systems (faunal, floral and physical elements of selected key ecosystems).

Data management

Examine impacts and document trends on the natural environment as well as human health. Report on the state of the Arctic environment and give advice on priority conservation and management issues.

Communication

Communicate the results and assessment products in an appropriate and responsible manner to all stakeholders, such as the AC, relevant international fora, the scientific communities, and the Arctic people.

User value

Input to sustainable use of resources, human health, ecosystem integrity, climate change, and regional and global programmes and commitments of the Arctic countries.

4.0 Potential synergies, opportunities for cooperation, and added values

Monitoring biodiversity allows for quantitative assessments of changes in the distribution, status, and trends of Arctic flora and fauna, and of changes in habitats and ecosystems. By targeting different levels of the natural environment, the CBMP is based on the principles of ecosystem-based monitoring. This allows for quantitative measurements in biodiversity losses and gains, and can then be coupled with targeted research initiatives to identify underlying causes driving the changes.

Cooperation between AMAP and CAFF monitoring will enhance determination of the underlying causes of biodiversity changes by integrating quantitative information on the complex relationships between biodiversity and contaminants, ozone depletion, and climate change, as well as a number of other factors such as habitat fragmentation, hunting impacts, changes in feeding opportunities, other conditions of the natural environment, etc. Synergies between CAFF and AMAP monitoring will lead to more powerful understanding of the impacts on the natural environment, of sustainable use, on human health, and will feed back into the ACIA process to improve the assessment of climate change issues.

Collaboration between the two monitoring programs can also help focus issues. Biodiversity monitoring can, for instance, signal potentials for targeted contaminants monitoring. Conversely, detection of unusually high levels of contaminants can drive monitoring and research into the biological effects at the species, habitat, and ecosystem levels.

Coordination between AMAP and CAFF monitoring programs is appropriate with regard to strategic elements such as the species chosen for monitoring, sites selected, and priority natural systems investigated. Priority sites, for example, are those of high biodiversity, of high human impact, well-developed infrastructure, etc. Cooperation of monitoring activities clearly center on identification of key indicator species, such as those from different trophic levels; of circumpolar, scientific, cultural, and/or economic importance; high conservation value; Arctic responsibility; and/or relating to international commitments, etc. The collection of the same samples or other data at common localities is important for efficient logistics, and allows for coordinated sampling for both biological and contaminant purposes in a cost-effective manner.

The Arctic is sparsely populated and logistics are relatively expensive. Community-based monitoring is therefore a logical and important option, to encourage participation, ownership, and informed education by Arctic communities. This type of cooperative monitoring is a matter of coordinating national monitoring programs, but the wider perspective of circumpolar priorities is also important. National monitoring programs can elevate key issues to a circumpolar scale. Similarly, issues of circumpolar importance can help in guiding national activities not currently dealt with.

Data management, including data sharing, creating common databases, and communicating results, is an important area for coordination between CAFF and AMAP. Integration of monitoring data for specific issues such as climate change and contaminants with biodiversity information is very relevant to provide policymakers with the information necessary for mitigative and adaptive policy measures. An assessment has already taken place for climate change in the ACIA Scientific Report, which identifies major knowledge gaps on impacts of environmental and human-related factors on biodiversity, and these gaps can be

partially filled with coordinated efforts between CAFF and AMAP.

In summary, cooperation between CAFF and AMAP will result in a number of value-added achievements, including:

- Better coordination in implementation of monitoring at the circumpolar level
- Integrated regional assessments, incorporating a greater range of impact factors
- Maximizing logistical, financial and scientific resources
- Efficient sharing of data between stakeholders
- Better information for conservation and management policies
- More effectively meeting international commitments
- A more coordinated Arctic approach towards global processes, such as climate change

5.0 Recommendations for Action

It is recommended that, at the circumpolar and national level, monitoring programs and strategies are harmonized as appropriate with regard to strategic elements such as list of species chosen for monitoring, sites selected, and systems. This harmonization should be reflected in national implementation plans, thus providing the potential for acquisition of comparable data at the circumpolar scale. The challenge to coordination at the circumpolar level mainly relates to finding the appropriate indicators and sites for the circumpolar, rather than the national perspective.

CAFF and AMAP will look at issues needing attention from monitoring activities from their individual perspectives, identifying and assessing the circumpolar relevance of monitoring programs, and defining priority recommendations. Despite appreciable existing monitoring information, it is recognized that there are deficiencies in Arctic monitoring, although this is more pronounced in biodiversity monitoring than in contaminants monitoring. Recommendations as to how to fill these gaps are an important component of this circumpolar cooperation. Hence, a compilation of existing monitoring projects is needed.

Coordination between the monitoring activities of AMAP and CAFF will be an ongoing process. In recognition of completion of the CBMP Framework Document, and all supporting documentation setting the foundation for the CBMP, it is recommended that AMAP and CAFF convene a workshop with selected experts to identify priority issues and parameters that should be a part of a CBMP/AMAP strategy. The expert workshop should analyze the similarities in strategic elements and data sharing, and formulate the most effective strategy for coordinating the respective monitoring programs, addressing ACIA specifically, and analyze the feasibility for a pilot project, to demonstrate the effectiveness of joint monitoring efforts.

Based on the outcome of such an expert workshop, a bigger “kick-off” meeting could be convened at a later date to develop a more detailed coordinated program to enhance monitoring of biodiversity and contaminants at the circumpolar, national and regional levels, with the aim that these would be incorporated into national implementation plans as appropriate.

This strategy should e.g.:

- 1 Identify ongoing activities, gaps and deficiencies in current monitoring and monitoring methods,
- 2 Analyse the feasibility of circumpolar networks in order to enhance common monitoring and harmonization of methods.
- 3 Take full notice of the results and suggestions of the ACIA report.
- 4 Discuss data management, production of assessment reports and other follow-up actions, etc.

The joint monitoring activities between CAFF and AMAP will be implemented in close cooperation with on-going and planned international activities e.g. the International Polar Year.

Cover photos:

Dunlin and young, Barrow, Alaska. Photo courtesy of Mike Denega

Brown bear, Kamchatka, Russia. Photo courtesy of Bjørn Frantzen

Ilulissat Icefjord, Greenland. Ilulissat Icefjord became a World Heritage site in June 2004. Photo courtesy of Mette-Astrid L. Jessen

Walrus. Photo courtesy of Grant Gilchrist

Murre breeding cliff, Coburg Island, Nunavut, Canada. Photo courtesy of Grant Gilchrist

Bog Bilberry / Alpine Blueberry (*Vaccinium uliginosum*), Hot Springs, Lavrentia, Chukotka Autonome Okrug, Russia (Beringia). Photo courtesy of Bjørn Frantzen

Young girl at Festival Ergav, Chukotka, Russia. Photo courtesy of Vera Tymneraskova