

Integrating Activities for Advanced Communities



D7.4: Providing data to Arctic Council assessments

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PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the Consortium (including the Commission Services)	
CO	Confidential, only for members of the Consortium (including the Commission Services)	

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Publishable Executive Summary

The purpose of deliverable D7.4 is having developed three CBMP ecosystem specific reference stations; and a User-Manual for implementing the CBMP Freshwater and Terrestrial plans at INTERACT stations; to look at lessons learned in this process, and to identify how data on freshwater and terrestrial biodiversity generated at INTERACT stations can inform Arctic Council Assessments. This entailed:

- Illustrating how stations could collect data on the CBMP Focal Ecosystem Components (FEC);
- Explaining what information on FECs should be collected; and
- Identifying how these data might be delivered to CAFF to inform its monitoring and assessment processes.

A sub-task under this deliverable was to identify and make known relevant Arctic Biodiversity Assessment and ICARP III recommendations to station managers which were presented at Station Managers' Forum meetings.

1. Introduction

The *International Network for Terrestrial Research and Monitoring in the Arctic* (INTERACT) is an EU funded initiative working towards building capacity to help identify, understand, predict and respond to environmental changes across the Arctic. This document provides an overview of deliverable **7.4 Providing data to Arctic Council assessments**

INTERACT Work Package (WP) 7 “*Improving and harmonizing biodiversity monitoring*” is led by the Conservation of Arctic Flora and Fauna (CAFF) Arctic Council Working Group. The overall goal of WP7 is to test the circumpolar Freshwater and Terrestrial Arctic biodiversity monitoring plans of CAFF’s cornerstone program, the Circumpolar Biodiversity Monitoring Program (CBMP), at INTERACT stations. The goal of the CBMP monitoring plans is to harmonize and integrate efforts to monitor the Arctic’s living resources through a network of scientists, governments, Indigenous organizations, and conservation groups. Through this harmonization and integration, the monitoring plans facilitate more rapid detection, communication, and response to the significant pressures affecting the circumpolar world. The objectives of WP7 through pooling resources and experiences are to 1) establish an efficient working interface between CBMP and INTERACT; 2) Test CBMP Freshwater & Terrestrial Plans in the field; and 3) identify how data from INTERACT stations can feed into Arctic Council Assessments. To achieve these objectives, WP7 undertook a series of tasks (each building upon the other) resulting in 3 deliverables to facilitate implementation of CBMP plans in the field:

- 7.1 Data management plan for the Icelandic RIF station in connection with the Arctic Biodiversity Data Service (ABDS) for the selected focal ecosystem components;
- 7.2 User manual for implementing CBMP at INTERACT stations; and a
- 7.3 Report describing how data might be provided to Arctic Council assessments.

Work Package 7 participants included:

- CAFF: Conservation of Arctic Flora and Fauna
- AU: Aarhus University
- SLU: Swedish University of Agricultural Sciences
- RIF: RIF Field Station
- CHARs: Canadian High Arctic Research Station

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1.1. Process to develop guidelines how to contribute to Arctic Council assessments

The process to develop this report on ways to provide data to Arctic Council assessments from INTERACT stations included a series of workshops (CAFF, 2017; 2018; 2019) to engage and receive advice and experience from WP participants and the resultant guidance developed based upon the

other work package deliverables.

2. Providing data to Arctic Council assessments

2.1. How can INTERACT stations collect relevant data - CBMP Freshwater and Terrestrial Arctic Biodiversity Monitoring Plans

The approach adopted in the CBMP Freshwater and Terrestrial plans follows the steps required for an adaptive and ecosystem-based monitoring program and includes a consideration of what future priority questions and user needs the program should address. This ecosystem-based approach integrates information across ecosystems, species, and their interactions, and lends itself to monitoring key aspects of ecosystems, called Focal Ecosystem Components (FECs). Where changes in FEC status likely indicates changes in the overall environment. This approach considers the integrity of entire ecosystems and their interaction with other ecosystems.

Each Arctic Biodiversity Monitoring Plan also describes expected outcomes and reporting, which is critical when considering how data from INTERACT stations might inform Arctic Council monitoring and assessment activities. The first outcome from implementation of these plans are a series of State of Arctic Biodiversity ecosystem which provide a baseline from which to determine status and trends of biodiversity in the ecosystem in questions; determine gaps in our knowledge; and provide advice on how to better improve and harmonize Arctic monitoring activities. The State of the Arctic Freshwater Biodiversity Report (SAFBR) was released in 2019 and the State of the Arctic Freshwater Biodiversity Report (START) is scheduled for release in 2020. Both these reports provide guidance and help inform on how data on freshwater and terrestrial biodiversity generated at INTERACT stations could inform Arctic Council assessments.

Deliverable D7.3 provides a user manual (<https://interact.caff.is/>; Figure 1) for how INTERACT stations facilitate implementation of the Freshwater and Terrestrial Arctic Biodiversity Monitoring Plans and in doing so to:

- Illustrate how stations could collect data on the CBMP FECs;
- Explain what information on FECs should be collected; and
- Identify how these data might be delivered to CAFF to inform its monitoring and assessment processes.

The CBMP Monitoring Plans are designed to take advantage of existing resources, monitoring capacity and data, however, where opportunities for new monitoring activities exist, the plan provides suggested priority monitoring elements and methodologies. Hence, when aggregating information from past or current monitoring initiatives the Monitoring Plans relies on the process of harmonization, i.e. extracting comparable information across different methodologies, of which the various papers in this special issue are good examples. The process of harmonization may encompass different methods, either through direct integration, combining derivative products, or through meta-analyses and modelling. The CBMP “core” function of targeted monitoring and reporting on selected FECs, support a myriad of other functions and networks required for ecosystem based monitoring, and broader national and international reporting needs. This includes detailed core attribute monitoring at the site/plot scale as well as the development of a

harmonized database to be used by relevant and targeted reporting on both national and international scales. Importantly, the Terrestrial Biodiversity Monitoring Plan provides suggestions for standardised methods to facilitate future comparisons.

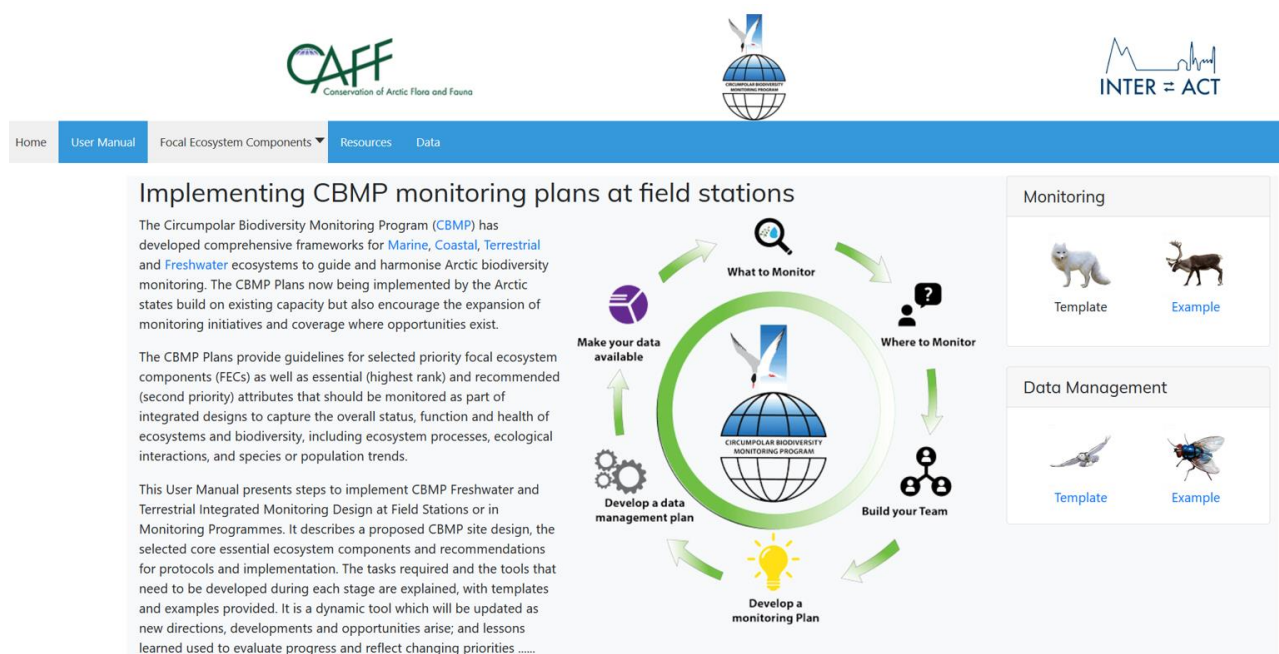


Figure 1. CBMP User-Manual to facilitate implementation of the Freshwater and Terrestrial Arctic Biodiversity Monitoring Plans.

2.2. Arctic Council biodiversity assessment – important background information

A primary objective of Arctic Council assessments on biodiversity are to provide a baseline of knowledge, which then provides a synthesis and assessment of our knowledge on status and trends of biodiversity. An up-to-date baseline understanding of status and trends and gaps in our knowledge is needed to support the development of management advice and policy recommendations on Arctic biodiversity.

The Arctic Biodiversity Assessment (ABA; Figure 2) released in 2013 provided the first circumpolar synthesis and assessment of the status and trends of biological diversity in the Arctic. It identified the current status of and historical trends in population size and distribution of Arctic species and, where available, presented projections of future change. As data on this scale are only available for a few well-known species and ecosystems, it was not possible to provide a comprehensive accounting of status and trends of all Arctic biodiversity. It was possible, however, to discuss broad trends in habitat



Figure 2. Arctic Biodiversity Assessment released in 2013

condition and extent, ecosystem function, and overall biodiversity. The ABA provided a much-needed description of the state of biodiversity in the Arctic. It:

- created a baseline for use in global and regional assessments of Arctic biodiversity to inform and guide future Arctic Council work;
- provided up-to-date knowledge gathered from scientific publications supplemented with insights from traditional knowledge holders;
- identified gaps in the data record;
- described key mechanisms driving change; and
- presented science-based suggestions for action on addressing major pressures on Arctic biodiversity.

In order to keep the baseline created by the ABA up-to-date CAFF through the Circumpolar Biodiversity Monitoring Programme (CBMP) (CAFF 2018a) is implementing a series of ecosystem-based monitoring plans (Marine (Gill *et al*, 2011), Freshwater (Culp *et al*, 2012), Terrestrial (Christensen *et al*, 2014) and Coastal (Jones *et al*, 2019)) which represent agreements across Arctic states to compile, harmonize and compare results from Arctic biodiversity and ecosystem monitoring efforts. Each plan identifies key elements, FECs where changes in their status likely indicates changes in the overall environment (CAFF 2018a). The first outcomes (Figure 3) from implementation of these plans are a series of State of Arctic Biodiversity reports (CAFF 2017a), State of the Arctic Freshwater Biodiversity report (CAFF 2019a), State of the Arctic Terrestrial Biodiversity report (scheduled for release in 2020) responding to ABA recommendation #13¹ on the need to fill gaps in our knowledge and detect trends.

¹ ABA recommendation 13: *“Increase and focus inventory, long-term monitoring and research efforts to address key gaps in scientific knowledge identified in this assessment to better facilitate the development and implementation of conservation and management strategies. Areas of particular concern identified through the ABA include components critical to ecosystem functions including important characteristics of invertebrates, microbes, parasites and pathogens”* (CAFF 2013a).



Figure 3. Outcome from implementation of ecosystem-based monitoring plans is presented in a series of “State of the Arctic Biodiversity” reports.

2.3. How can INTERACT Stations provide data to assessments - Arctic Biodiversity Data Service (ABDS)

The ABDS is the online, interoperable data management system for biodiversity data generated via the Conservation of Arctic Flora and Fauna (CAFF), the Arctic Council’s biodiversity working group (<https://www.abds.is/>; Figure 4). Its goal is to facilitate access, integration, analysis and display of biodiversity information for scientists, practitioners, managers, policy makers and others working to understand, conserve and manage the Arctic's wildlife and ecosystems. ABDS ensures that biodiversity data provided to CAFF are organized to guarantee a lasting legacy in a manner that facilitates data discovery; increased understanding; more informed and rapid decision-making; and ongoing research. Partnerships have been established with other international platforms, including the Arctic Spatial Data Infrastructure (Arctic SDI), Group on Earth Observations Biodiversity Observation Network (GEOBON), the International Network for Terrestrial Research and Monitoring in the Arctic (INTERACT) and the Global Biodiversity Information Facility. As an Arctic node within GBIF, any data added to the ABDS is automatically harvested and accessible via GBIF. It is furthermore anticipated that the information generated by the Monitoring Plans will be used to inform sub-global and global assessments (e.g. CBD Global Biodiversity Outlooks (SCBD 2010, 2014) and global IPBES assessments (2019), and to bring monitoring data collected at the local scale into international reporting. In order for data generated at INTERACT stations to inform Arctic Council biodiversity monitoring and assessment activities either 1) the metadata repository for an INTERACT station should be interoperable with the ABDS; or 2) data should be submitted directly to the ABDS.

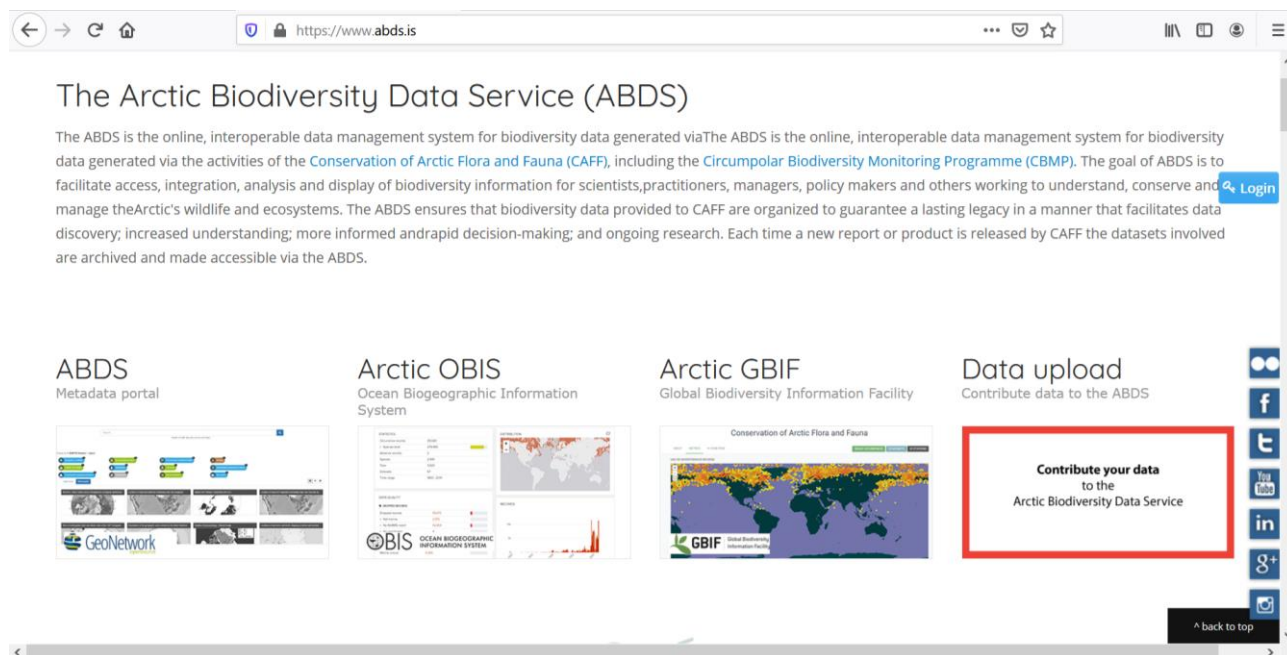


Figure 4. To ensure that data from INTERACT stations can contribute to the Arctic Council Biodiversity monitoring and assessments, the station need to upload their data in a repository that is either interoperable with the Arctic Biodiversity Data Service (ABDS) or the data should be submitted directly to ABDS.

3. Arctic Biodiversity Assessment and ICARP III recommendations

During the INTERACT programme Work Package 7 informed INTERACT participants including station managers on relevant Arctic Biodiversity Assessment (see above) and The third International Conference on Arctic Research Planning (ICARP III) recommendations. ICARP III provides a framework to identify Arctic science priorities for the next decade; to coordinate various Arctic research agendas; to inform policy makers, people who live in or near the Arctic and the global community and to build constructive relationships between producers and users of knowledge. ICARP III does not undertake the development of new science plans but rather builds on the many comprehensive science plans that exist already and compliments those with processes to identify gaps that may need attention. More information about ICARP III can be found at <https://icarp.iasc.info/icarp>. Information about the Arctic Biodiversity Assessment and the ICARP III recommendations was done through direct emails to station managers and presentations both at the annual INTERACT meetings and the annual Station Managers' Forum.

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