Circumpolar Biodiversity Monitoring Programme - Terrestrial EMG

Terrestrial Expert Monitoring Group:

Developing a Plan for the Circumpolar Arctic

By:

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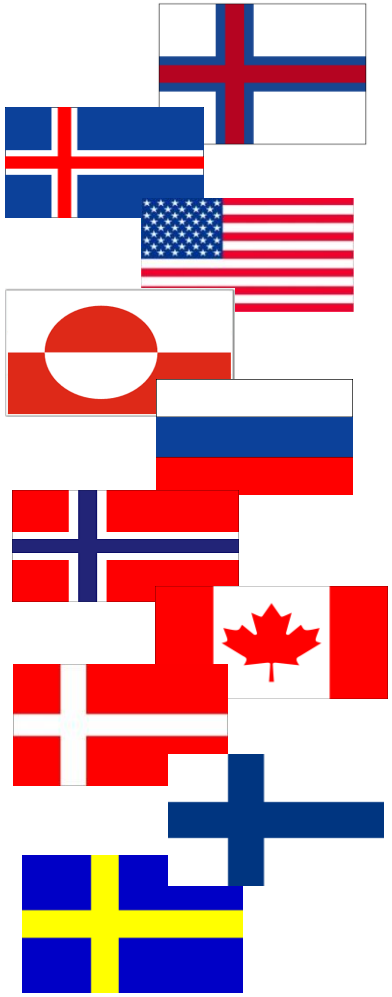
Terrestrial Expert Monitoring Group

CIRCUMPOLAR BIODIVERSITY MONITORING PROGRAM – Terrestrial EMG

- TEMG is a working group established under Circumpolar Biodiversity Monitoring Program (CBMP)
- Approved by Arctic Council
- Leads are Greenland/ Denmark and US.
- One member from each of the Arctic countries and also Permanent Participants.
- **GOAL** is to promote, facilitate, coordinate and harmonize terrestrial biodiversity monitoring activities among circumpolar countries, and to improve ongoing communication amongst and between scientists, community experts, managers and disciplines both inside and outside the Arctic.
- Main output will be an integrated ecosystem based monitoring plan for the monitoring of terrestrial ecosystems in the Arctic.



What is CBMP and TEMG

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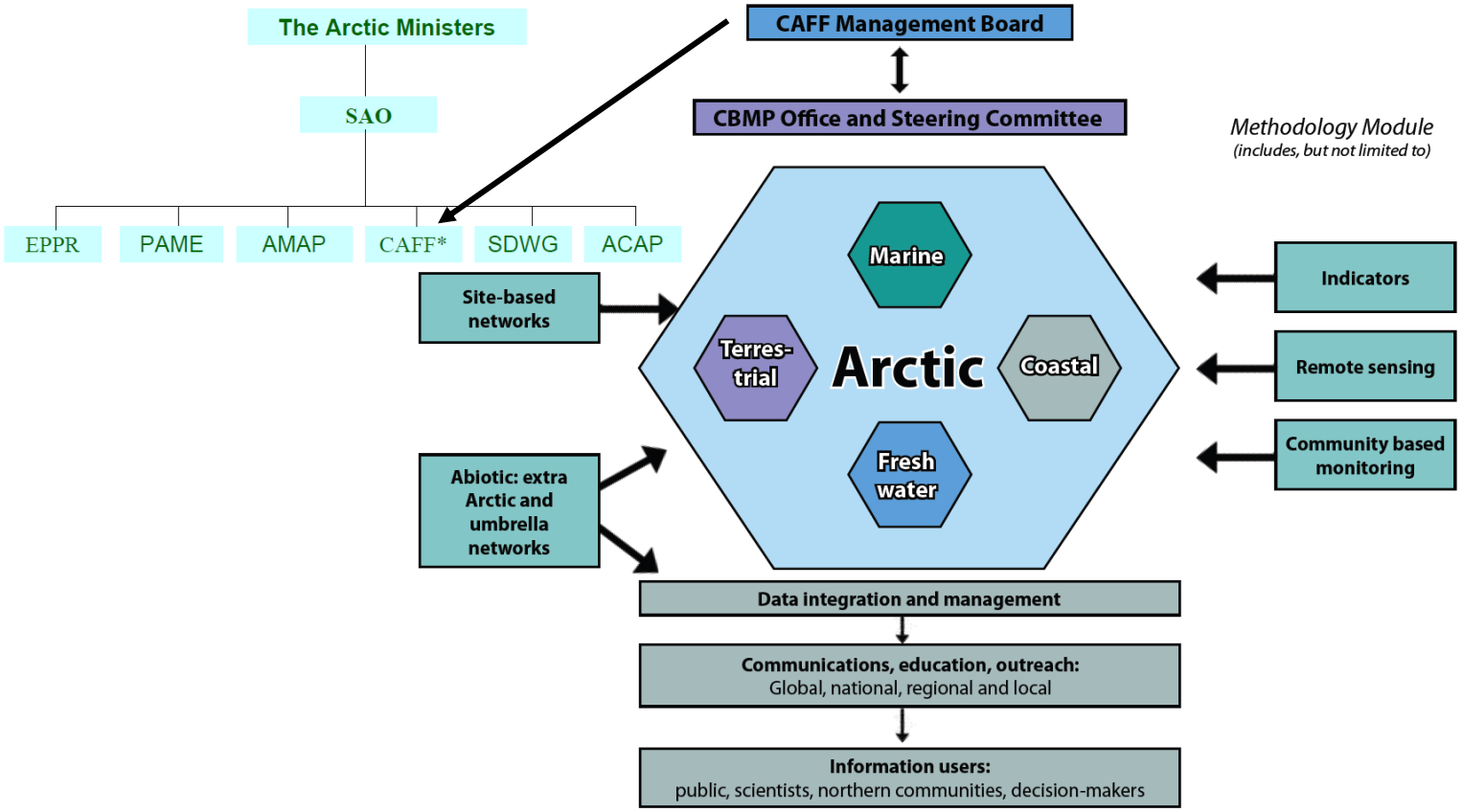

Figure 1. Relationship of Expert Monitoring Groups to the Circumpolar Biodiversity Monitoring Program of the Conservation of Arctic Flora and Fauna. Outputs of a coordinated monitoring approach for Arctic terrestrial ecosystems will serve a number of mandates at various scales, and build on a network of networks.

Purpose and need of TEMG

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Purpose: To ensure more efficient and effective delivery of the results of the terrestrial biodiversity monitoring in the Arctic to decision makers, stakeholders and the general public and to ensure better coordination between existing terrestrial monitoring networks.

Need: Originally CAFF had a narrow species focus. But a broader and more integrated approach is now essential in order to develop effective conservation and adaptation strategies. In relation to biodiversity this approach includes;

- A more functional species and ecosystem aspects
- The development of a better understanding of how the Arctic's living resources are responding to changes, and how these changes compare with global biodiversity trends

Early decisions and linkages

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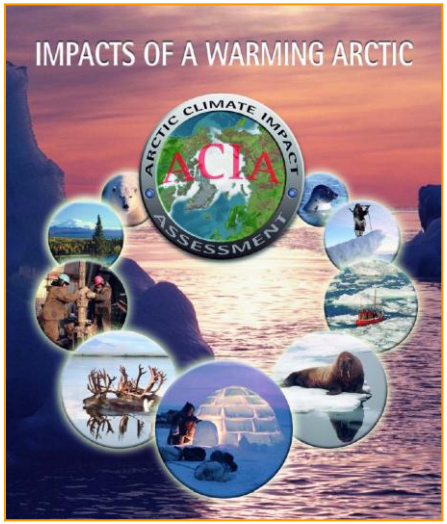

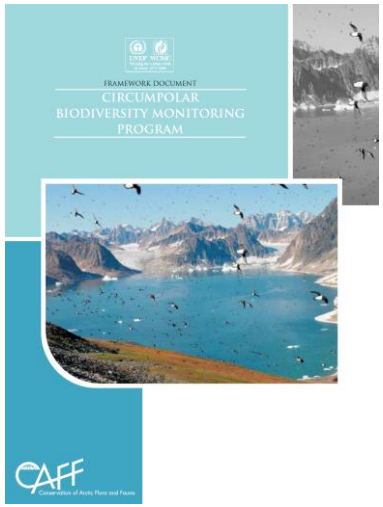

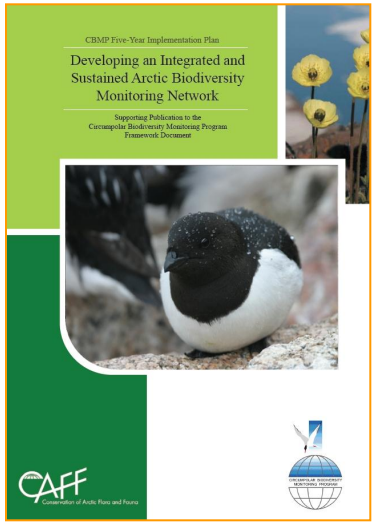

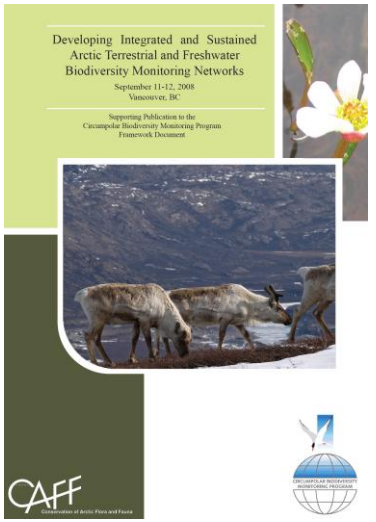

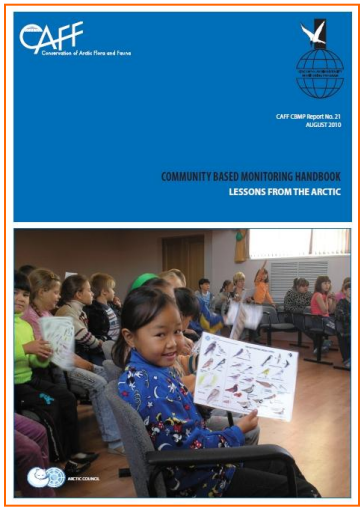

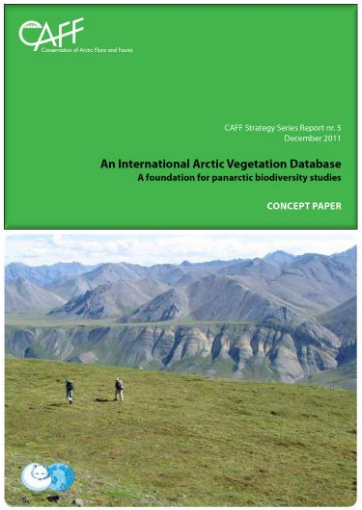

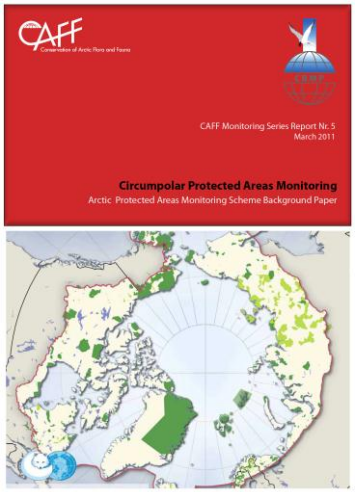

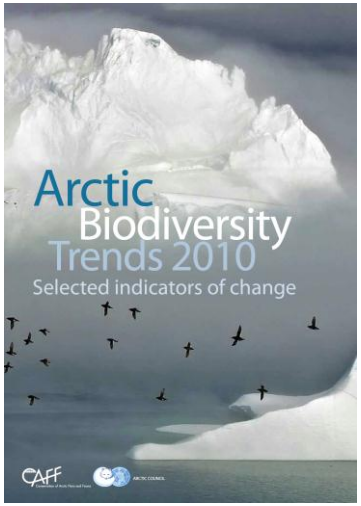

Geographic boundaries

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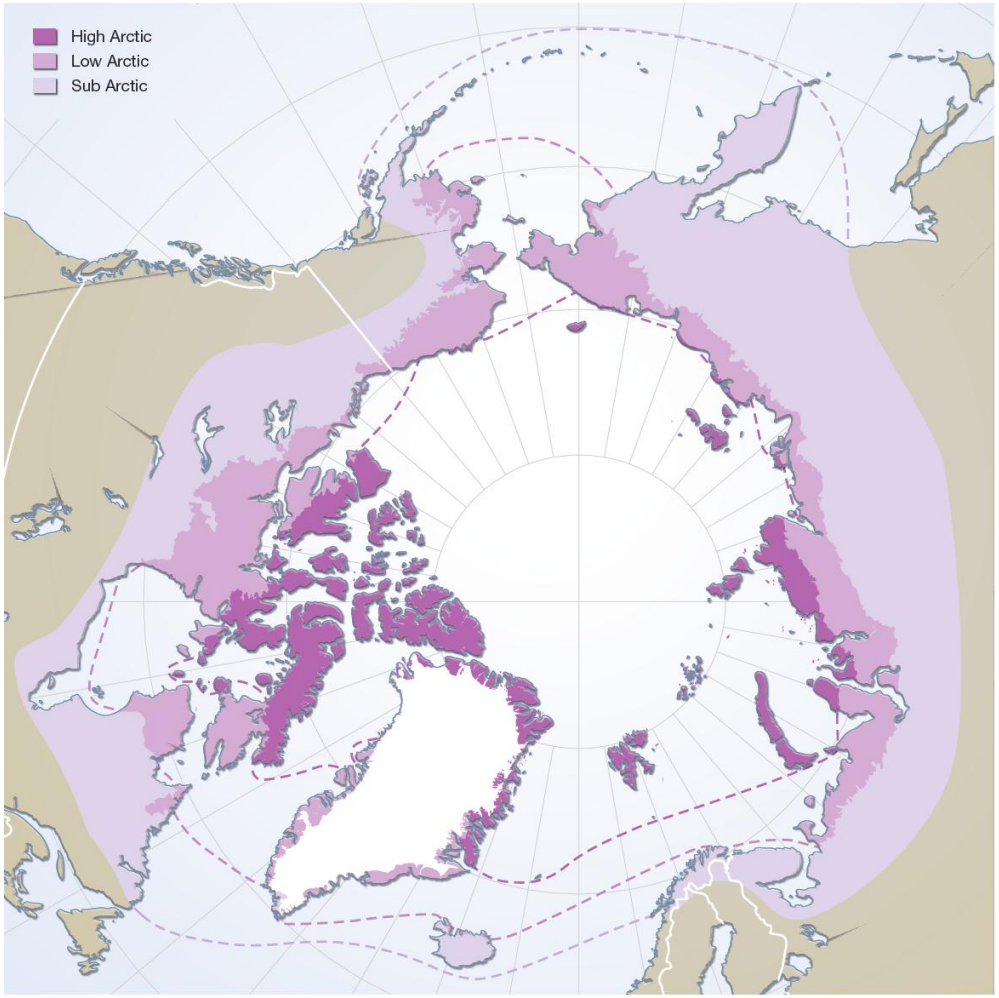

Boundaries of the geographic area covered by the Arctic Biodiversity Assessment
(Source: CAFFs Arctic Biodiversity Trends 2010: selected indicators of change)

Boundaries of the geographic area:

We use the same as is covered by the Arctic Biodiversity Assessment defined by the division between high Arctic, low Arctic and sub Arctic according to the Circumpolar Arctic Vegetation Map. In principal, only high and low Arctic is covered; however, with the inclusion of alpine sub-Arctic regions in proximity of the Arctic proper

Work-plan status

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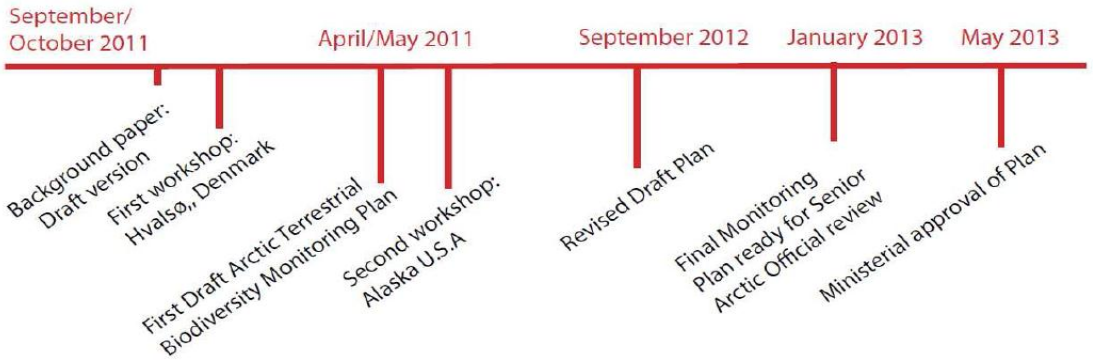
- Lead countries identified – autumn 2010 at CAFF biennial
- Steering committee activated – winter 2010/ 2011
- All Arctic countries represented in the TEMG - spring 2011
- ToR approved by CBMP steering committee – spring 2011



- Terrestrial IMP Drafts for Country and Peer Review - autumn 2012
- Final Terrestrial Biodiversity Monitoring Implementation Plan for Arctic Council Endorsement – spring 2013
- Implementation period – 2013 forward

Platform for the work in TEMG

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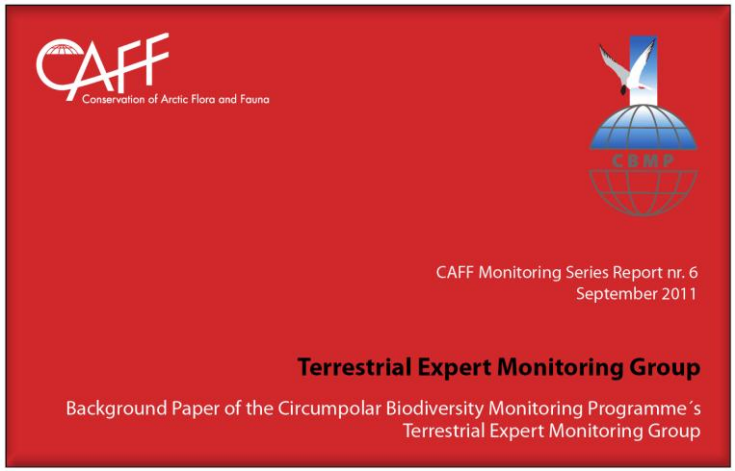
Backgroundpaper:

- Developed by the TEMG:
- Gives guidelines for the frames for the monitoring approach and methods
- Based on preliminary inventory of existing monitoring
- Used as platform for the work at the two workshops



Existing monitoring (preliminare inventory)

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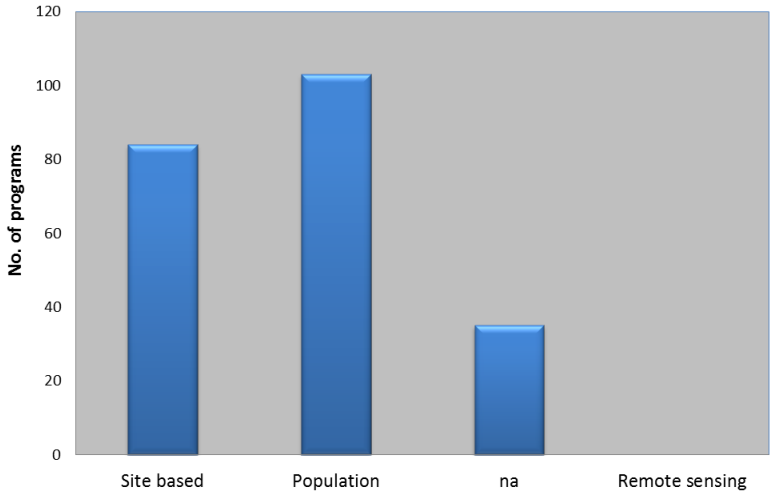

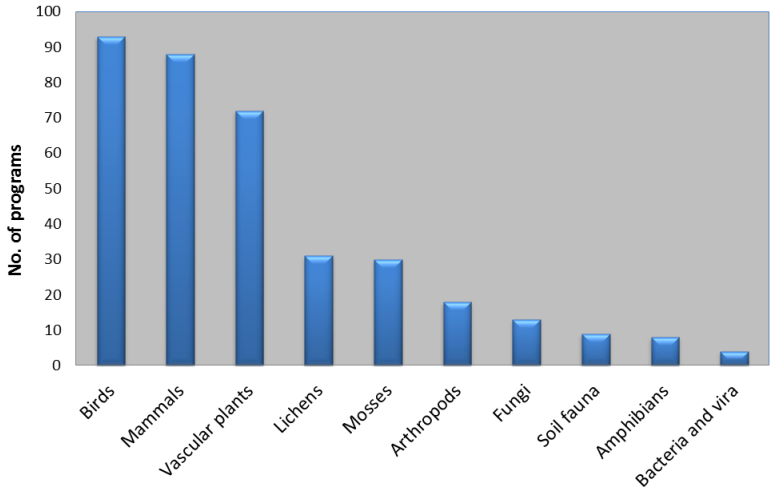

Thematic groups established

Focused discussion on monitoring plan components is structured through five groups:

- Avian
- Mammals
- Vegetation
- Invertebrates
- Fungi

TEMG – Backgroundpaper & workshops

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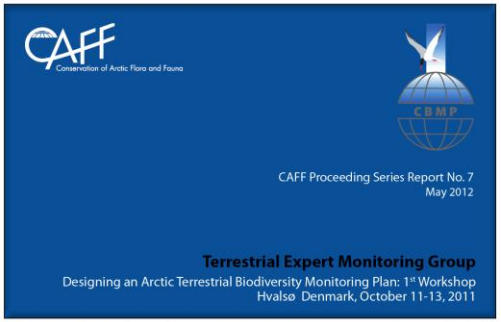
The first workshop in Hvalsø in 2011helped TEMG to:

- Discuss questions that we can expect the main users (administrators, politicians, local communities etc.) to ask us.
- Initiate the design of a framework for an integrated monitoring strategy
- Identify many of the ongoing monitoring activities/programs (inventory of existing monitoring & common workshop with IASC & INTERACT)
- Identify some of the key elements, attributes and parameters that should be monitored (incl. vegetation).



The second workshop in Anchorage helped TEMG to:

- Rank the key elements / components based on defined criteria for selection, and describe selection criteria for each component.
- Direct input into a first draft of the IMP including a description of the priority key biodiversity elements and indicators, and start defining a design for future coordinated pan-arctic samplings.
- Give a description of issues related to data management, data harmonization and reporting

How to design a protocol for adaptive (model based) monitoring

(Lindenmayer & Likens)

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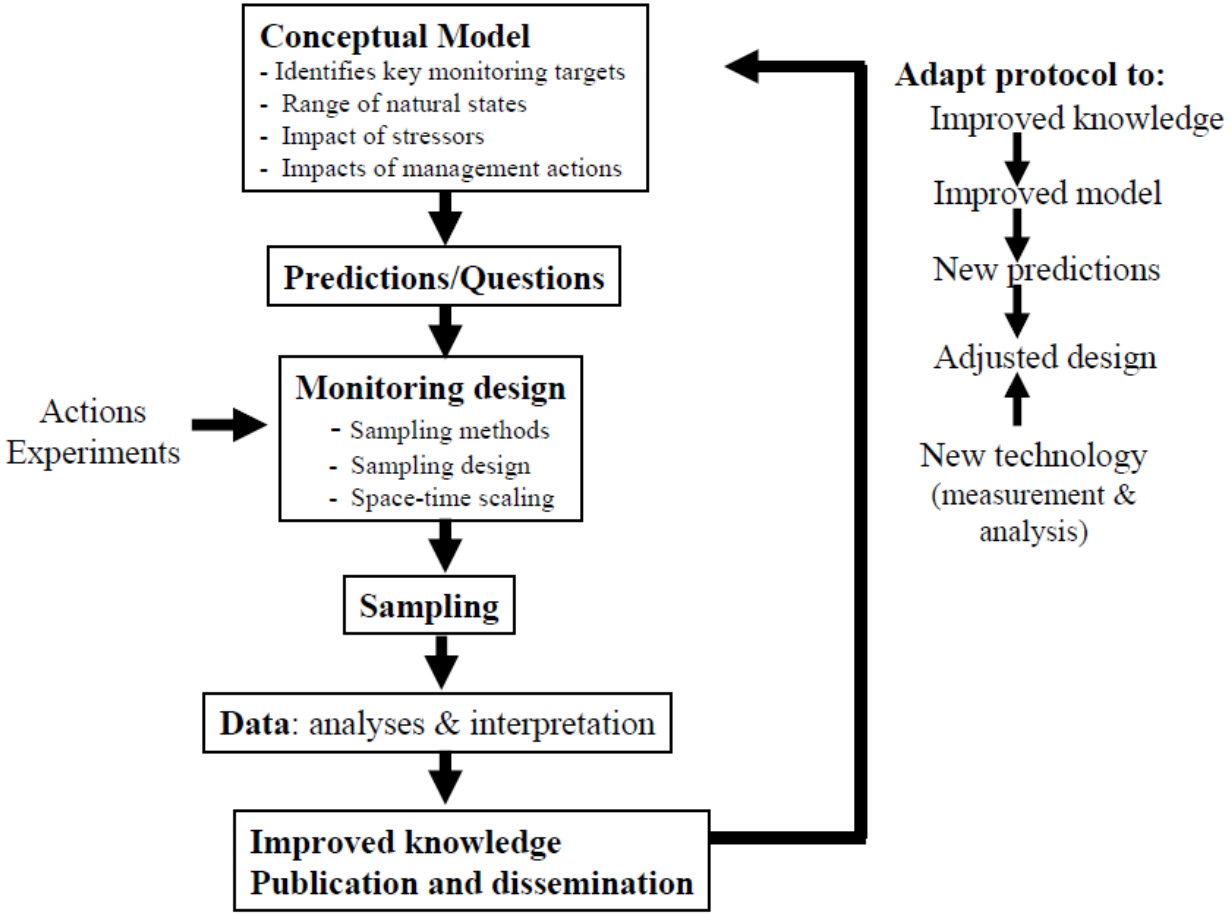

Important preconditions when designing a circumpolar monitoring plan are among others:

- Good questions
- A conceptual model of an ecosystem or population
- Strong partnerships between scientists, policy-makers and managers
- Frequent use of data collected.

Lindenmayer and Likens Argue that the major characteristics of effective monitoring programs typically include:

•Define common understood criteria to identify key monitoring targets

•Define scale of the monitoring programme

The TEMG conceptual figure

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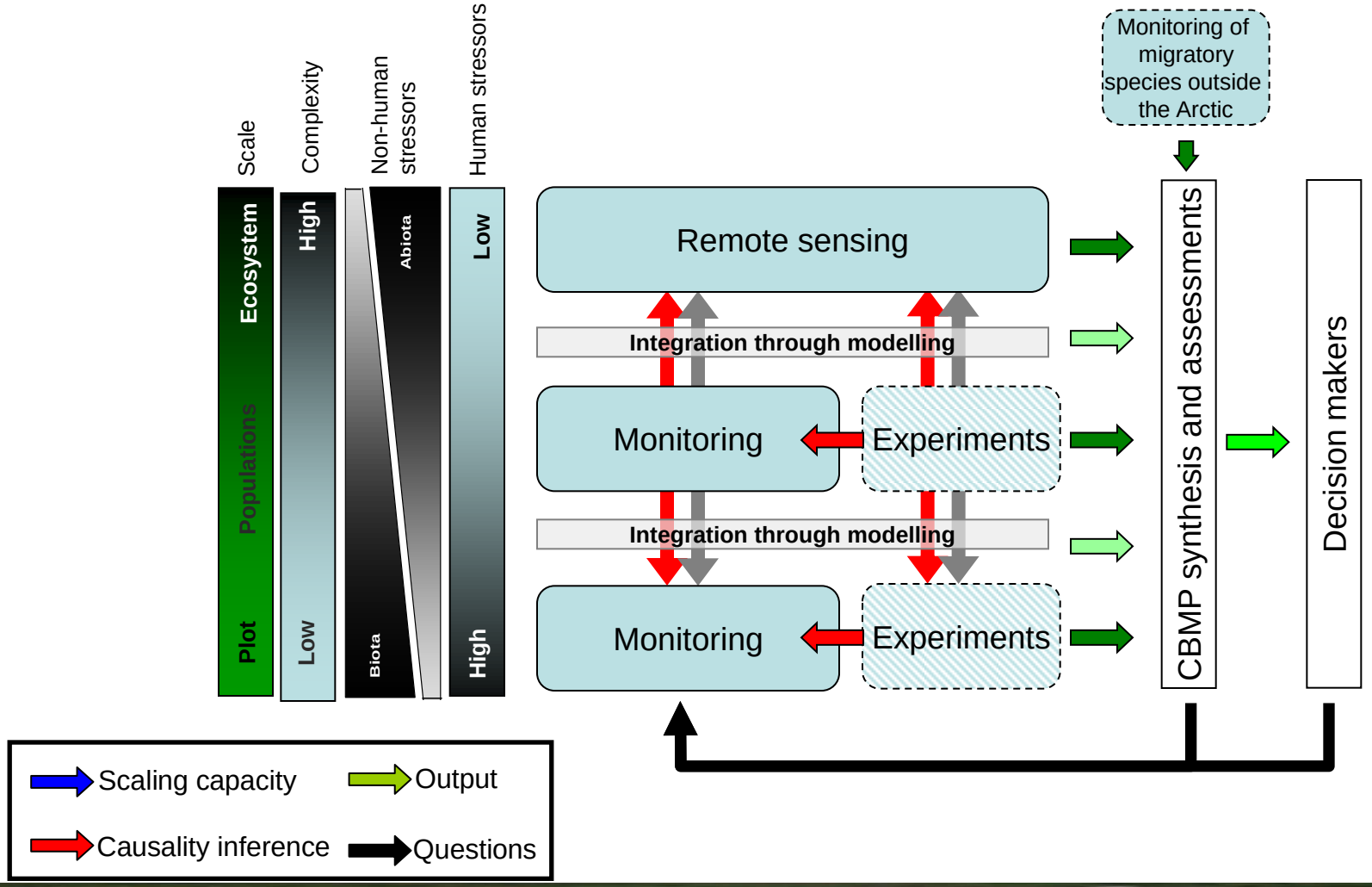

The conceptual figure

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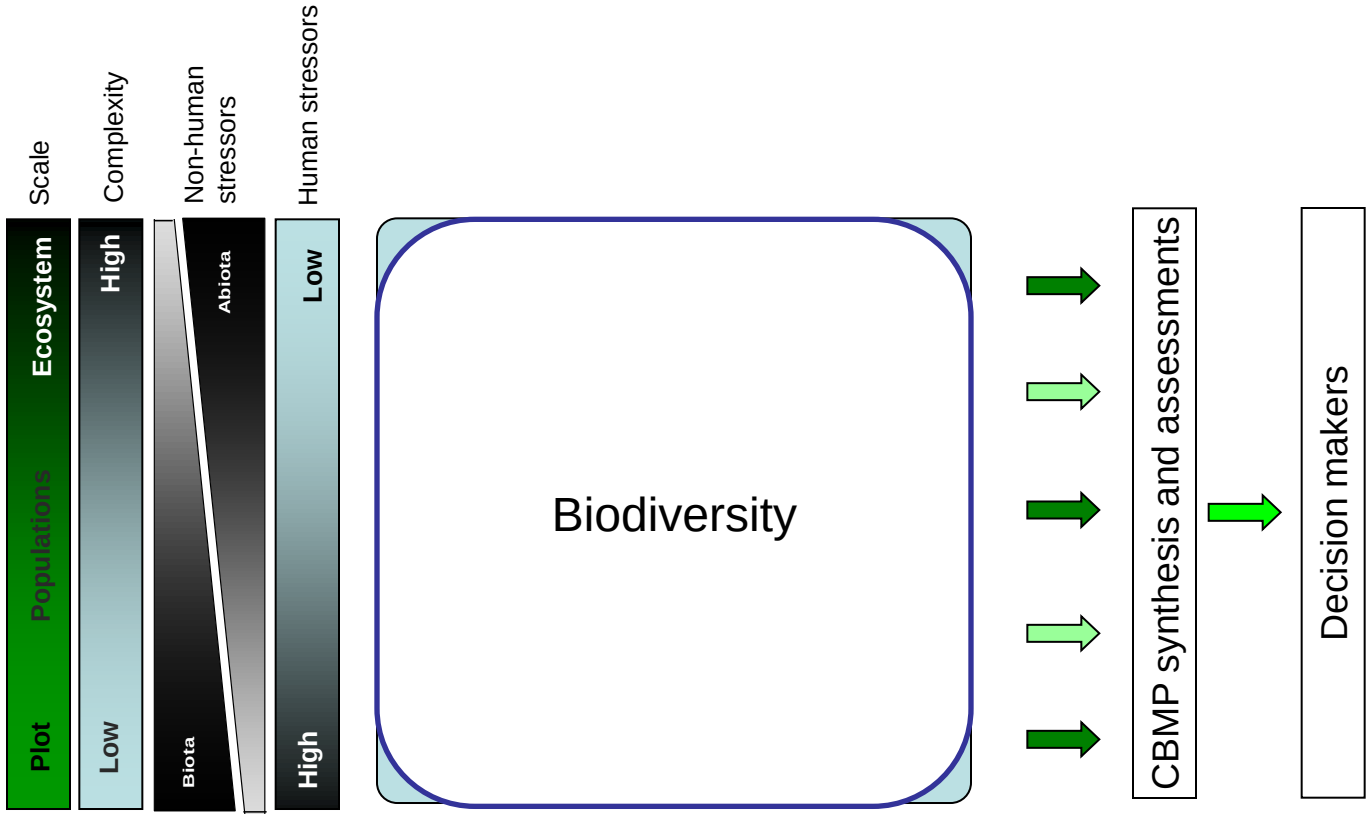

Scaling capacity
Output
Causality inference
Questions

The conceptual figure

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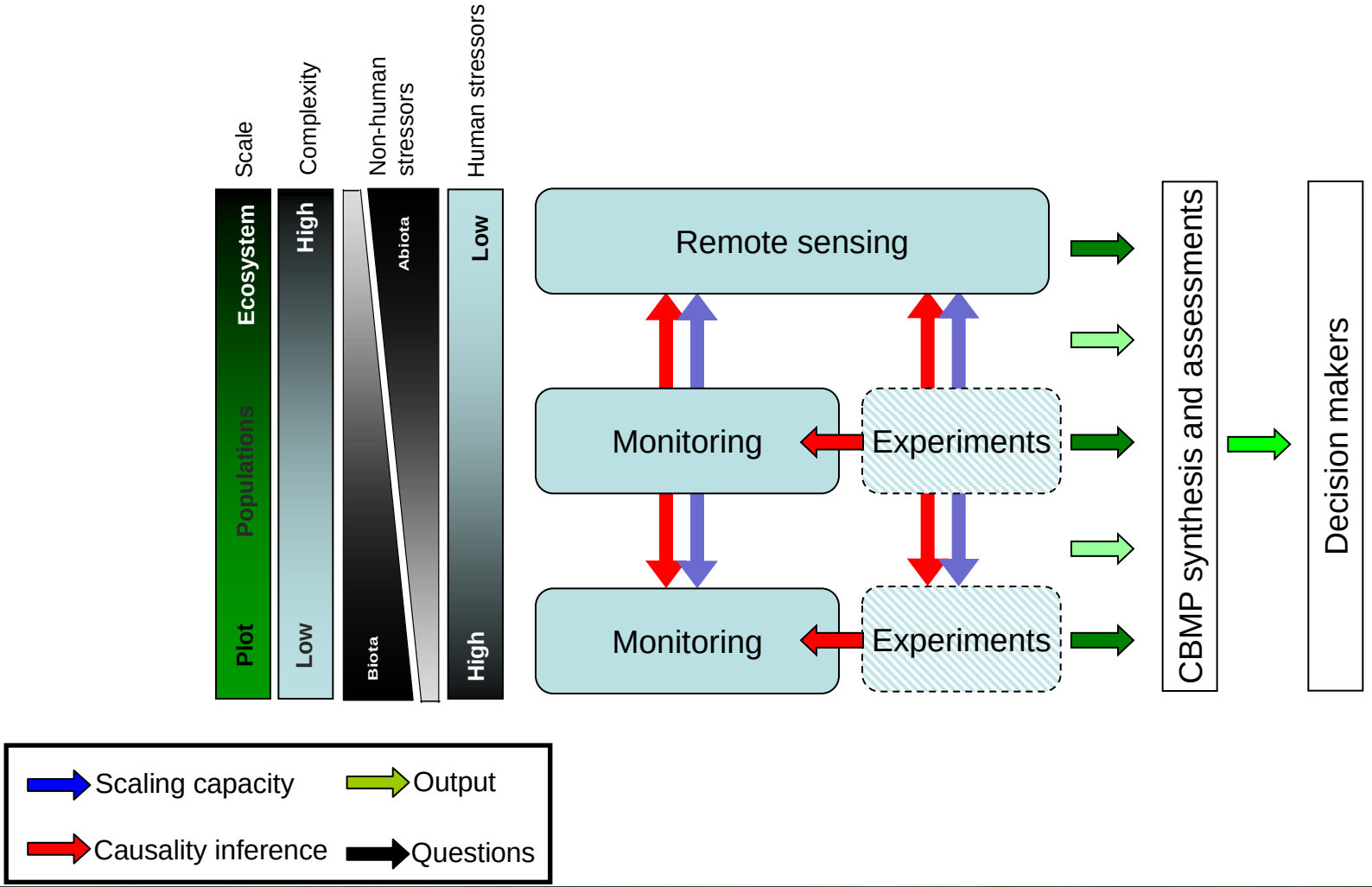

The conceptual figure/ Integrating among methods and scales

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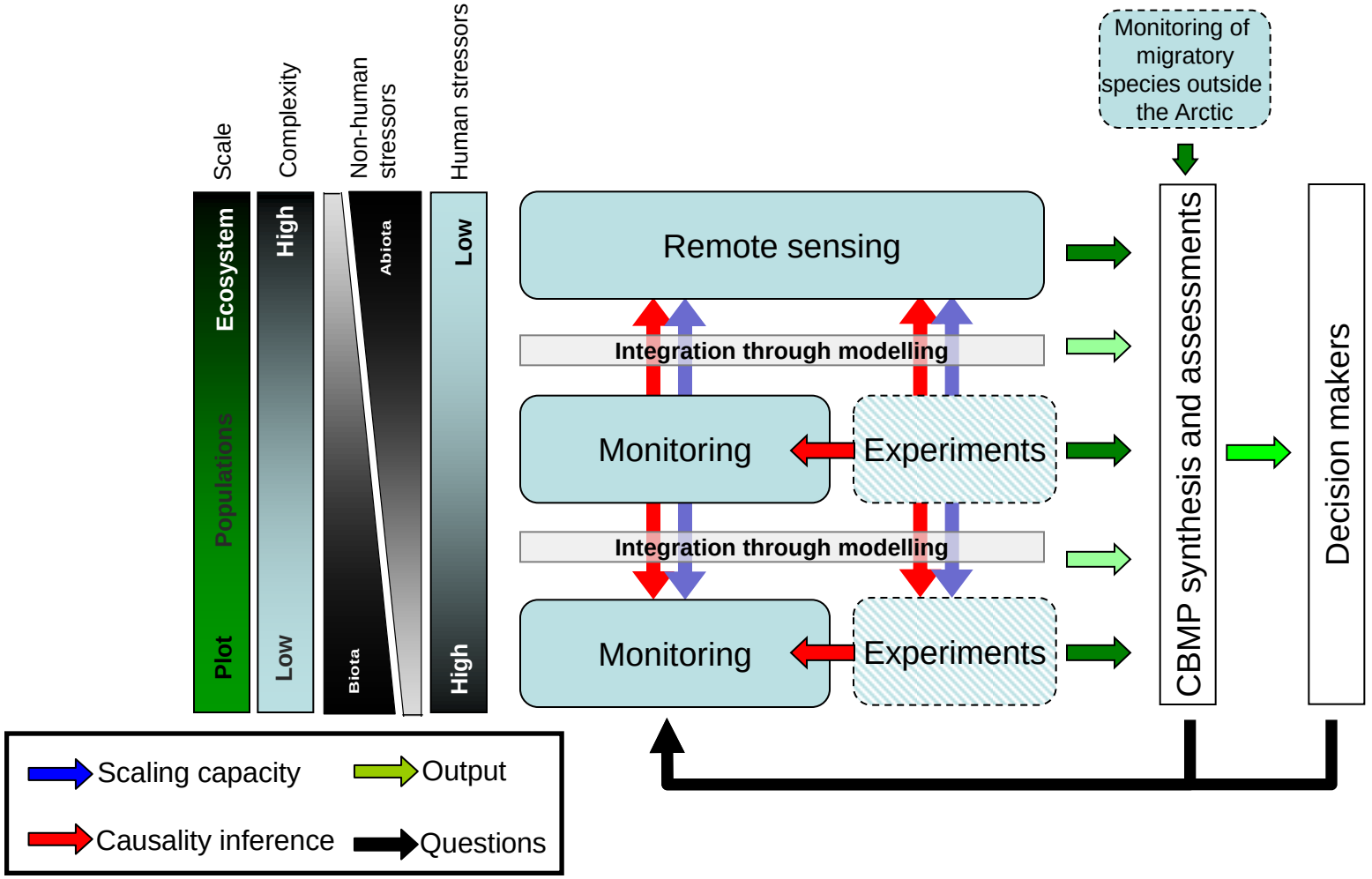

Based on Conceptual Models

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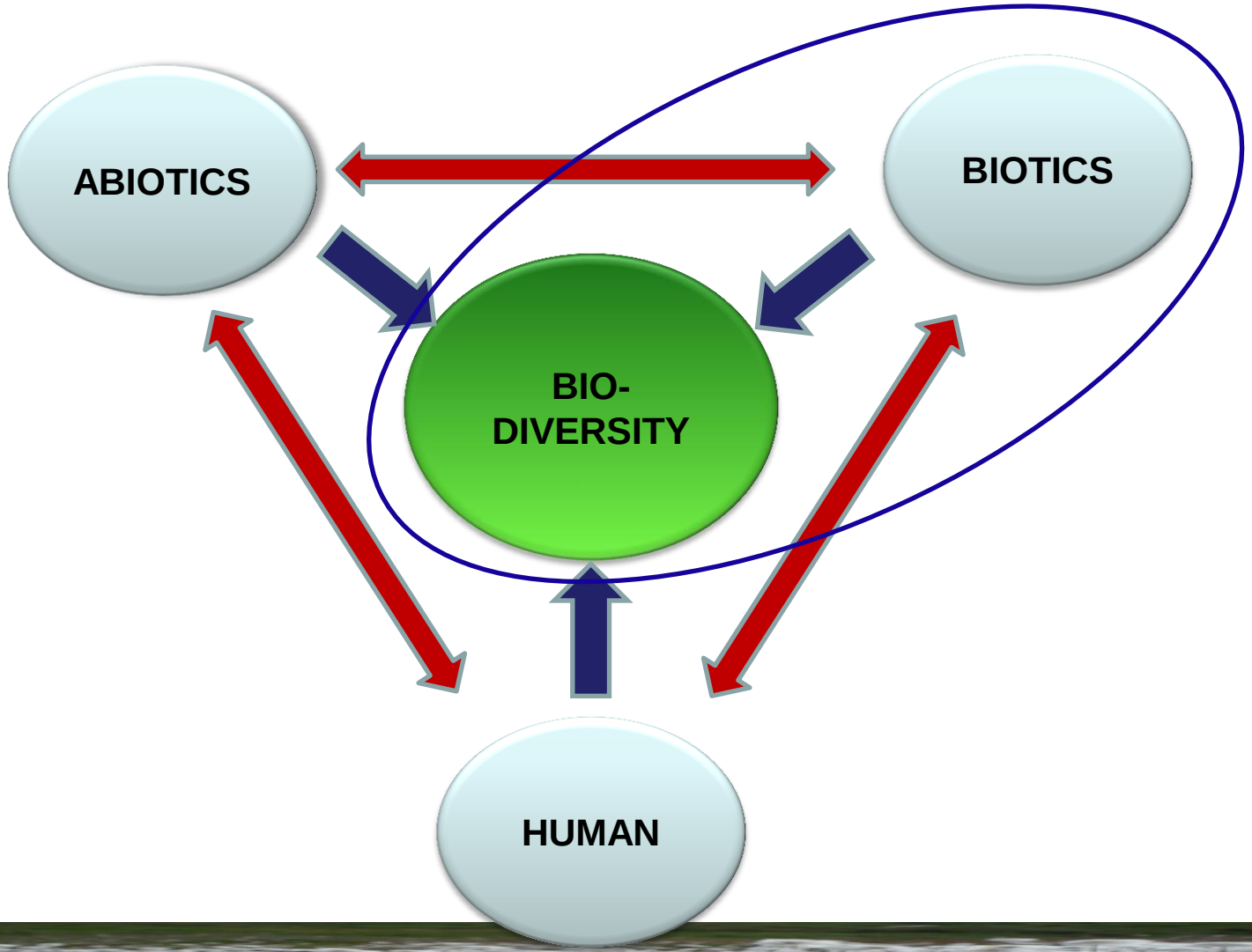

CAFF
Conservation of Arctic Flora and Fauna

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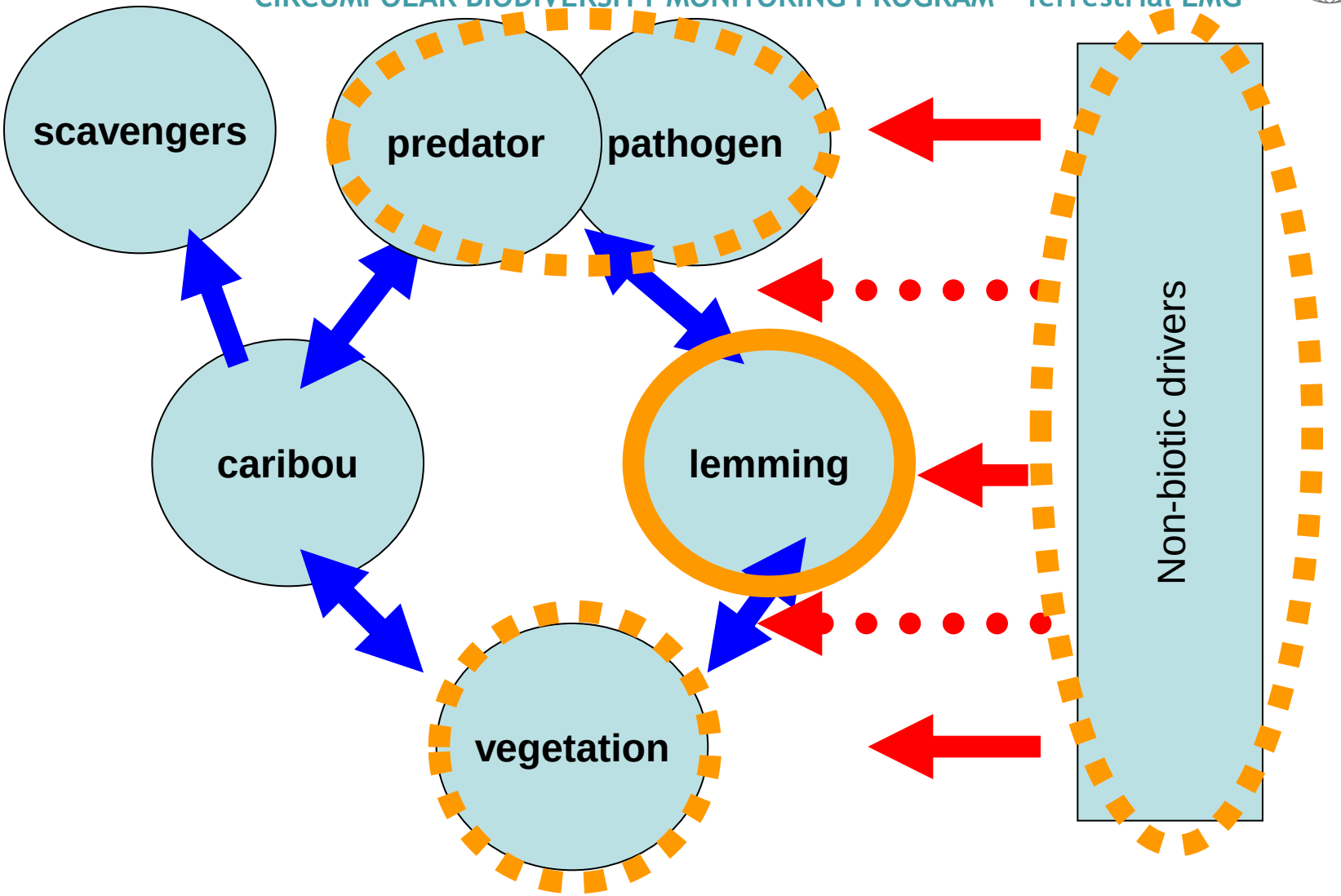
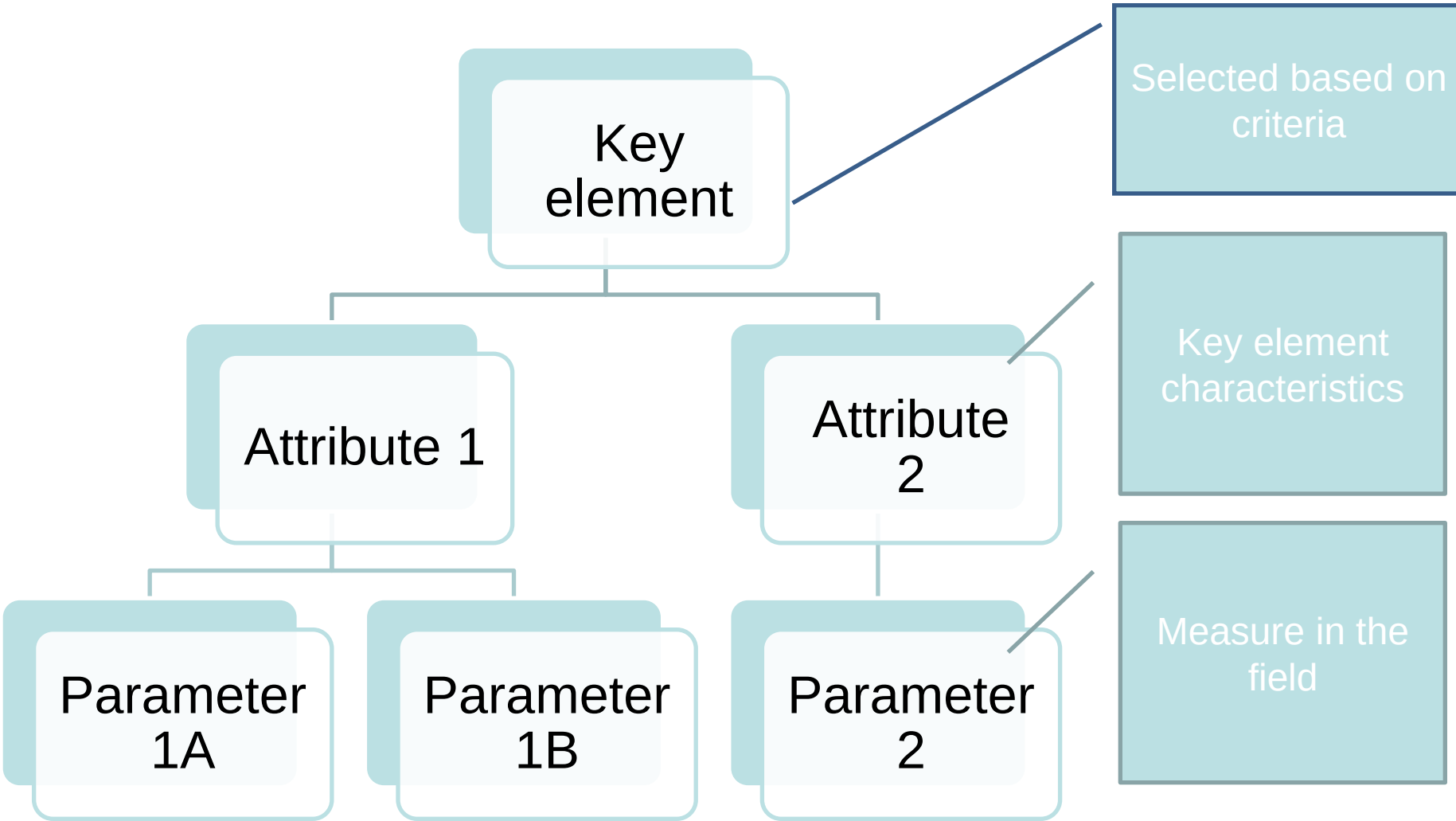


Hierarchial approach



From conceptual model to actual monitoring

Key element	Attribute	Parameter
Caribou	Abundance	Number
	Demographics	Calf percentage
		Age composition
		…
	Health	Prevalence
		…


Thank You

Integrated Monitoring Plans (IMPs) in CBMP

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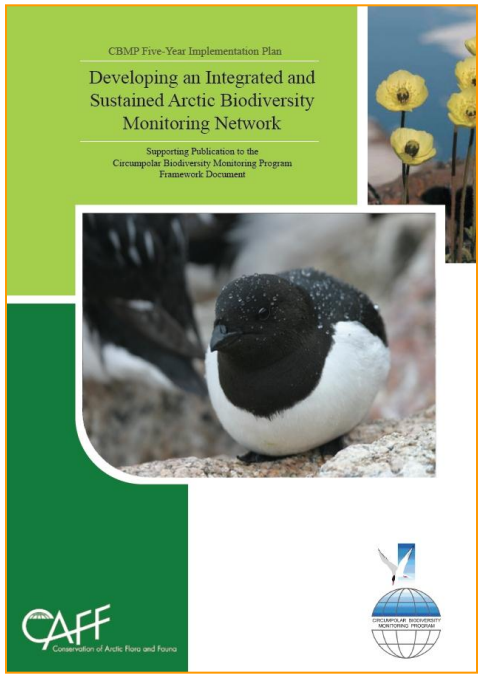

- Respond to **'clients' needs**
- **Small set of** circumpolar, plus regionally specific **parameters**
- **Linked to** relevant and multiple **drivers**
- **Simple**, based on existing capacity & info
- **Identifying gaps**, and promote missing monitoring
- **Optimal sampling** and **partners** identified
- Establish **baselines** and **assessments**
- Using both **community-based** and **scientific** approaches

Monitoring based on key ecosystem elements identified through conceptual models

An integrated monitoring approach needs to reach across programs, jurisdictions, stakeholders, and agencies to manage for ecosystem sustainability (i.e., capacity).

The TEMG will use the following steps to identify monitoring key elements for consideration – the two workshops will help us:

- Identify management questions to be answered;
- Develop a high-level conceptual ecological model for the Arctic to identify terrestrial ecosystem "themes" and stressors
- Develop a conceptual ecological model(s) for each of the ecosystem "themes". and,
- Identify a suite of key ecosystem elements, attributes, and parameters to report on status and change across Arctic terrestrial ecosystem attributes.