Arctic Migratory Birds Initiative (AMBI)

Circumpolar Flyway Work Plan

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Introduction
The Arctic Migratory Birds Initiative (AMBI) is a project undertaken by the Arctic Council, through its Conservation of Arctic Flora and Fauna (CAFF) working group. The overall objective of AMBI is to improve the status and secure the long-term sustainability of declining Arctic breeding migratory bird populations. The Arctic Council recognizes that much of the conservation action needed to meet this objective will occur outside of the Arctic. Therefore the AMBI is organized around flyways that arctic migratory birds traverse throughout their life cycles.

AMBI’s work is guided by a steering committee, and specific goals and actions are developed through flyway-specific work plans.

The Circumpolar Flyway

In addition to the traditional flyways identified as areas of concern, the AMBI Expert Group identified a “circumpolar” flyway that covers focal species (seabirds and seaducks) that spend most or all of their life cycle in Arctic regions, and migrate east-west rather than north-south. At a meeting of experts in Montreal in February 2014, by-catch, overharvest, and habitat degradation were identified as the priority conservation issues for focal species on this flyway.

The Montreal expert’s meeting gave direction for the development of this work plan, which was undertaken by CBird, CAFF’s seabird expert group.

The circumpolar flyway is considered to be the area within the CAFF boundary.
Circumpolar Flyway Workplan Objective

Since most of the threats to marine birds in the circumpolar flyway are place-based, the most pressing need is for research action to identify where and when these birds congregate during their life cycle (particularly during the non-breeding season) and how these areas overlap with established and emerging commercial fisheries.

The 3 issues identified by the AMBI expert group as priorities for the Circumpolar workplan include:

1. critical lack of information on key at-sea sites for marine bird congregations,
2. habitat degradation, and
3. seabird bycatch in commercial fisheries

Issues and Actions

Issue 1: critical lack of information on key at-sea sites for marine bird congregations

Birds at sea are proxies for ecosystem health and indicators of environmental change (Frederiksen et al. 2007, Piatt and Sydeman 2007). Identifying Arctic marine areas that support high numbers of birds will help to flag shifts in seabird and seaduck distribution relative to changes in habitat, as well as aid managers in prioritizing marine conservation areas.

Several research methods will be employed to identify marine areas that support large numbers of marine birds. These include colony-based and at-sea surveys, at-sea tracking, and analyses of harvest statistics. The distribution of seabirds at sea changes as water masses change so the survey results need to be compared to physical characteristics of the water, i.e. sea surface temperature (SST) and salinity, and biotic factors e.g. primary production and zooplankton data. At-sea monitoring allows population trends and especially changes in distribution throughout the range of a species to be determined for many species simultaneously.

Action 1.1: Develop and implement at-sea surveys

At-sea surveys address the full scale of seabird biodiversity present in a respective area at given time of year, and surveys can in theory be carried out at any time of year.

Winter surveys of seabirds are inevitably carried out at sea but can sometimes be difficult to execute due to poor weather conditions, limited light conditions and few working research vessels. Because of these factors, transects could concentrate on high density areas, which are often coastal and which in some locations can be done from small boats or from the shore. Important data can also be collected from aerial surveys, which are also weather-dependent and costly, but have shorter sampling times and much larger coverage than vessels.
Collaborative ventures with research and fisheries monitoring vessels can provide platforms of opportunity, especially during seasons difficult to survey from smaller vessels.

Recently the following ideas have been discussed by the CBird group for at-sea surveys:
- start with 10 to 15 pilot areas
- monitor every 1-5 years
- monitor selected coastal and open sea areas
- use local ferries and research vessels for permanent transects
- use vessels of opportunity for one-time transects
- use observers on vessels with continuous plankton recorders
- liaison with existing global monitoring programs

Measureable Target to Evaluate Action – at-sea surveys
- improved temporal and spatial coverage of seabird habitat use
- analysis of habitat use in relation to biotic and abiotic factors

Action 1.2: develop and implement at-sea tracking
With the advent of light weight inexpensive tracking devices we are now able to define areas used by seabirds at sea, both during the breeding season and the non-breeding season. Importantly, tracking data will fill gaps in temporal and spatial coverage as at-sea surveys generally cover a small portion of seabird habitat. This information is extremely important in understanding which parts of the oceans are important to seabirds as well as timings of movements over different scales. Over time tracking studies will demonstrate changes in areas used by seabirds in relation to changes in the ocean productivity that may be caused by overfishing, pollution or climate change.

At-sea tracking should target species vulnerable to fisheries by-catch (identified in Zydelis et al. 2013), and indicator species that occupy areas throughout their lifecycle that are not likely to be monitored by ship-based or aerial seabird surveys.

Measureable Target to Evaluate Action – at-sea tracking
- improved temporal and spatial coverage of seabird habitat use
- analysis of habitat use in relation to biotic and abiotic factors

Action 1.3: Identify areas where key marine seabird habitats intersect with current and especially emerging commercial fisheries, resource exploration and shipping developments
Existing seabird distribution data can be combined with results of at-sea surveys, at-sea tracking, colony-based research, and ship tracking data from organizations such as the Marine Security Observations Centres (MSOC) in Canada to map the overlap of coastal and pelagic seabird hotspots with ship activity, resource exploration and commercial fisheries (focusing down to fisheries in which specific species – or groups – are most susceptible). Special planning and efforts will have to be made to obtain fishing effort data, particularly for smaller vessels, which tend to be poorly monitored compared to larger vessels. This

Comment [BL4]: Important to have standard protocol for recording sightings, otherwise transects won’t be comparable. BirdLife South Africa AS@S database has established a simple reporting format.

Comment [r5]: Need to add a timescale to this? Not sure what is reasonable, depends how much data is already out there...

Comment [AB6]: CBird has plans to coordinate tracking studies – Grant please elaborate.

Comment [BL7]: Need a baseline for this as well. BirdLife recently compiled 1000 tracks from 19 datasets on 14 Arctic species.

Comment [r8]: As above – need a timescale to make it truly measurable

Comment [r9]: This has been, and is, notoriously hard to get a hold of – we should make specific reference to this – it will affect the ability to do meaningful analysis.
Exercise would identify target geographic areas and associated resource users for community outreach exercises and policy and regulation development.

Measureable Target to Evaluate Action – overlap of key marine bird areas and resource development activities

- Identification of areas where research and management priorities should take place
- Areas where longline and trawl fisheries and marine bird hotspot overlap are identified
- Best practice mitigation measures adopted where marine birds and ships or resource development overlap

**Action 1.4: Guidelines should be developed for reporting harvest so that any link to seabird bycatch is detectible** (Merkel 2011) (need to develop this section more)

**Issue 2: habitat degradation**

Seabird colonies are generally located in coastal areas which are the interface between marine and terrestrial ecosystems. This, in addition to their propensity to congregate in large numbers, makes them vulnerable to disturbance related to human activities (e.g. shipping, resource extraction infrastructure, tourism, natural resource development).

**Action 2.1: identify and participate in current initiatives to facilitate protection of marine birds and marine bird habitat**

Within the circumpolar flyway there are several global and regional initiatives underway that have the potential to facilitate habitat protection and minimize disturbance for focal circumpolar flyway species. These initiatives should be identified and engaged in to ensure that critical breeding and wintering areas for seabirds and seaducks are taken into account when planning for resource extraction activities, commercial fishery exploration, and shipping developments. Initiatives that endeavor to coordinate conservation across boarders could be prioritized as it is often much more difficult to implement.

**Current initiatives to engage with include:**

- **Ecologically and Biologically Significant Marine Areas (EBSA, global)**
- **Strategic Environmental Assessment for Baffin Bay/Davis Strait (Canada)**
- proposed Lancaster Sound National Marine Conservation Area feasibility assessment (Canada)
- **Important Bird Area identification**

**Action 2.2: ensure that appropriate guidelines for seabird colony viewing are identified and adopted**

The Protection of the Arctic Marine Environment (PAME) working group of the Arctic Council is leading the Arctic Shipborne Tourism Initiative (ASTI). The ASTI aims to promote sustainable tourism across the circumpolar Arctic through the development of best practices for a suite of shipborne tourism activities.
Seabird colony viewing should be flagged as an activity of interest and input into the drafting of best practices should be provided to ASTI and adopted by member states.

**Issue 3: bycatch**

Gillnet fisheries globally are estimated to kill 400,000 birds every year (Zydelis et al 2013), with a substantial proportion of this mortality coming from higher latitudes, particularly in the northern hemisphere (estimated annual bycatch mortalities from Iceland, the Baltic Sea and NW Pacific are 100,000, 76,000 and 140,000 respectively). An estimated 300,000 seabirds are killed in longline and trawl fisheries each year. While there is a suite of best practice mitigation measures to reduce this toll in longline and trawl fisheries, the same does not exist for gillnets fisheries (e.g. see ACAP Best Practice mitigation advice for longline and trawl fisheries) and, to date, there has been little research in this regard.

In addition to the limited research into mitigation, the lack of directly observed bycatch data coming from gillnet fisheries (and other commercial fisheries) is another barrier to achieving progress in bycatch reduction. Broadly speaking, observer effort in fisheries worldwide is far below minimum levels (20% of the fleet) that would give satisfactory estimates of seabird bycatch, and data collection protocols are frequently not well-designed for the purpose of estimating fishery-wide bird mortality. Further, observer coverage in gillnet fisheries is often even lower than in other fleets because they tend to be (though are not always) smaller-scale operations with lower quota shares, making them a lower priority for national monitoring programmes.

The recent Zydelis et al (2013) review of seabird bycatch in gillnets acknowledge this data deficiency: "*In general, knowledge of seabird bycatch in gillnet fisheries is highly fragmented. Even from regions where numerous reports are available, e.g. the Baltic Sea, information often originates from short-term studies and opportunistic observations. Bird bycatch in gillnets is rarely the subject of systematic and continuous monitoring. Better knowledge is needed from every region where seabird bycatch is known or could be anticipated*".

To being to deal with the issue of bycatch around the Arctic, three broad actions are proposed:

- Better understand the scale of seabird bycatch (particularly gillnets) on the circumpolar flyway
- Develop and test mitigation measures to reduce seabird bycatch in gillnet fisheries
- Implement best practice mitigation measures in Arctic longline and trawl fisheries

**Action 3.1 gill net bycatch assessments in key regions**

It is proposed that further efforts are made to elucidate the scale of gillnet bycatch on the Circumpolar flyway, particularly in the identified hot-spots of the NW Pacific, Iceland and Baltic Sea. Given evidence of seabird (particularly eider) bycatch in the Icelandic lump sucker fishery, gaining further data from this, and similar fisheries in Greenland and Newfoundland, is considered important.
Identifying the scale of bycatch in these key areas/fisheries could have several aspects:

- Assess existing data on gillnet bycatch from national observer programmes, independent studies, grey literature (i.e. any update on the Zydelis et al review, or any national data that has not been made available to date?)
- Encourage contracting parties to share (anonamized) gillnet fishing effort data to examine overlaps with bird distribution (links to issue 1)
- Assist national governments in incorporating seabird bycatch data collection into existing observer programmes through updating protocols and providing training and expertise [NB: something I am sure BirdLife can assist with!]
- Identify key fisheries where observer coverage is lacking and prioritise capacity increases in these fisheries

Measureable Target to Evaluate Action – gill net bycatch assessments in key regions

- Existing bycatch data reviewed/updated
- Observer programmes updated to incorporate seabird bycatch data collection
- Observer programmes implemented to collect seabird bycatch (and other) data in gillnet fisheries

**Action 3.2: development and testing of bycatch mitigation measures**

In order to reduce seabird bycatch in gillnet fisheries, mitigation measures must be investigated. One emerging and one established Arctic fishery are proposed to test and develop technical mitigation measures. Utilisation of spatial/temporal fisheries management measures is proposed for the wider Arctic, in areas with known bycatch problems. Finally, the implementation of existing best practice seabird bycatch mitigation measures in Arctic longline and trawl fisheries should be promoted.

a) Technical Mitigation Measure Development in an emerging fishery– Nunavut, Canada

In Canada, Nunavut has an emerging fishery for turbot (Greenland Halibut, *Reinhardtius hippoglossides*) and shrimp (Northern, or Pink, Shrimp, *Pandalus borealis*; striped shrimp, *Pandalus montagui*), though other species are being examined for their marketability. These species are fished commercially using long lines and gillnets, and fishing activities are concentrated in Baffin Bay and Davis Strait. Though fishing levels are currently low, it is expected that the industry will grow quickly as quotas increase and new fisheries develop (Aarluk Consulting Inc. 2014). This presents an incredible opportunity to research, develop and implement bycatch mitigation measures early in the development of Nunavut’s fishery, thereby normalizing conservation-oriented standard operating procedures.

Though seabird bycatch in Canadian Arctic waters is known to exist (Mallory 2006) there is a paucity of data on bycatch levels and the species involved. Despite this, efforts to test the effectiveness of experimental mitigation measures such as gear type and sensory alerts (visual and audio) in Arctic waters should be made in areas where species that are susceptible to gillnet bycatch (identified in
Zydelis et al. 2013) congregate in large numbers (see Issue 1 above). Seabird bycatch reduction measures should be developed alongside the expansion of Nunavut fisheries, allowing for local and regional resource users and managers to actively participate and perhaps lead in experimental trials and policy implementation.

Measureable Target to Evaluate Action - Technical Mitigation Measure Development in an emerging fishery

- Mitigation measure testing experiments established in collaboration with fishing industry
- Mitigation measure that successfully reduces seabird bycatch identified

b) Technical Mitigation Measure Development in an established fishery—Lumpsucker gillnet fishery

As in Nunavut, experimental gillnet fishery mitigation measures (gear type and sensory alerts) should also be tested for effectiveness in an area with established fisheries that has both high bycatch (to ensure large sample sizes) and local enthusiasm for the project. Prospective options: Icelandic lumpsucker gillnet fishery; same fishery in Greenland; any options in Norway.

Measureable Target to Evaluate Action - Technical Mitigation Measure Development in an established fishery

- Mitigation measure testing experiments established in collaboration with fishing industry
- Mitigation measure that successfully reduces seabird bycatch identified

c) Spatial/temporal measures – Arctic-wide

In the absence of tried and tested best practice seabird bycatch mitigation measures for gillnets, spatial and temporal management of fishing activity has a clear role to play in reducing the impact of gillnet bycatch, particularly in the short-term. Developing a meaningful system requires: knowledge of existing key areas for susceptible seabirds (migration routes, breeding sites, foraging areas, moult sites – see issue 1), overlaps with gillnet fishing effort and some knowledge of the scale of gillnet bycatch in these areas. Work could be prioritised on the basis of conservation status of potentially impacted species, risk of population-level impacts and intensity of bycatch rate (where known).

Measureable Target to Evaluate Action - Spatial/temporal measures

- Key habitat sites for susceptible species identified and management measures implemented (spatial/temporal measures)

Action 3: Implement best practice bycatch mitigation measures in Arctic longline and trawl fisheries that overlap with bycatch-vulnerable species habitat.

Best-practices for longline and trawl fisheries have been developed (see ACAP Best Practice mitigation advice), so efforts should be made to engage with resource managers in all CAFF contracting parties and
regional fisheries management organizations to have these recommendations implemented as fisheries continue to expand and overlap with areas of large seabird concentrations.

Measureable Target to Evaluate Action – best practices in long-line and trawl fisheries

- Best practice mitigation measures adopted by key Arctic longline fleets
- We need a measurable to reflect the engagement with resource managers – this could be number of mitigation trials, or development of bycatch estimates for X fleets, or number of meetings held with management authorities/industry...this all links with the first measurable target of identifying key areas of overlap...

Data Management

The CBird Working Group plans to develop data-management systems that facilitate improved access to existing data and integration of this data between disciplines, while maintaining the data holders’ ownership and control of the data. It is expected that each country would still be responsible for supporting data management (e.g. quality control of data and compilation of existing national datasets) and contributions from their individual monitoring networks (i.e., the data holders), whereas the CBird Group will focus its efforts on building the mechanisms to access and integrate this data across countries and networks, as well as promoting a common, standardized data-management approach among the countries. For this approach to be successful, it is imperative that national datasets are made available.

The CBird Group has already made good progress on developing the Seabird Information System (SIN). SIN is online and currently has much of the colony locations in the Arctic, the CBird Group is still working on getting the productivity and population trends current.

Agencies Involved

Conservation of Arctic Flora and Fauna, CBird Expert Working Group
Royal Society for the Protection of Birds/BirdLife International
Environment Canada (Science and Technology and Canadian Wildlife Service)

Potential Agencies Involved

Nunavut Wildlife Management Board
Department of Fisheries and Oceans Canada
Environment Canada-Department of Fisheries and Oceans Incidental Take Group
Canadian High Arctic Research Station
PEW Foundation
WWF
References


