INDICATOR #19

Seabird harvest

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The use of living resources is fundamental to many regions of the Arctic, and for coastal people, marine mammals and seabirds are among the principal sources of harvest. The human use of seabirds varies between the circumpolar nations, both in scale and in form, but often dates back hundreds of years. Historically, birds were taken for their meat, eggs, skins, and down [1]. With the exception of skins, they are still harvested for these body parts but harvest methods have changed over time to include more efficient tools, making the seabirds more exposed to excessive harvest. By nature, most seabirds are already sensitive to adult mortality since they produce small clutch sizes and have delayed maturity [2, 3]. Further, they are generally challenged by low temperatures and reduced day length at high latitudes and periodically suffer due to extreme weather conditions [4, 5].

Although the impact of harvest on seabird populations is often poorly documented in the Arctic as a result of limited information on both seabird numbers and harvest levels in some areas, there is no question that it has played a key role in the population dynamics for many species. There are both examples of overharvesting causing substantial decreases in breeding populations and rapid population recovery following major changes in harvest regulation [6].

The fact that seabirds in the Arctic are migratory species (e.g., many breed in one country, and overwinter and are harvested in another country) makes management and assessments of harvest more complicated and makes international cooperation necessary. Within the Arctic countries, seabird harvest has been a conservation issue and focus of the Circumpolar Seabird Expert Group (CBird) under CAFF for several years, e.g., producing conservation strategies and action plans for selected seabird species [7–9].

Population/ecosystem status and trends

Until the 20th century, communities were small and hunting was done primarily from non-motorized watercraft and so likely had only a local impact on seabird populations. Since then, human population growth, mechanized transport, and the use of guns has increased the harvest of many species of seabirds. This increase in hunting pressure occurred simultaneously with increases in human disturbance at some seabird colonies related to offshore oil and gas development, commercial fisheries, tourism, and research [1].

Within the Arctic, there is a distinction between subsistence, commercial, and recreational/sports hunting. The line between these categories, however, is not always clear and differs between countries. Commercial hunting is forbidden in most countries, but in the Faroes, Iceland, and Greenland it is legal to supplement other sources of income by some domestic or local sale of "subsistence" seabird harvest [6].

Over the past three decades, depending on the country, harvest levels tended to decline as a result of factors such as more restrictive hunting regulations, declining seabird populations, fewer or less active hunters, or a combination of these factors (Figure 19.1). In some countries, particularly the Faroes, Iceland, and Greenland, the decline in harvest has been drastic. Declines in the harvest of 50% or more have been reported for several species. There is also a tendency that seabirds are increasingly harvested for cultural or recreational reasons, rather than for basic subsistence or commercial purposes. One exception is the collection of eiderdown in Iceland, which currently generates an annual revenue of up to approximately US$4 million per year [6]. In Alaska, Canada, Greenland, and Russia, it is still common practice that more extensive harvest rights apply to indigenous peoples or certain northern communities, acknowledging that subsistence harvest is essential for them to maintain a traditional lifestyle.

The number of birds presently harvested, or believed to be harvested, varies enormously between the nations. In north Norway and Svalbard, the estimated take equals less than 5,000 birds per year, while Canada, Greenland, and Iceland are, or recently were, harvesting in the order of 250,000 seabirds annually. The most common species in the harvest also varies from country to country and depends largely on traditions and accessibility to the seabirds. In a circumpolar perspective, however, murres, *Uria lomvia*, and eiders, *Somateria* sp., constitute by far the most numerous birds harvested, primarily as a consequence of their widespread distribution. Certain species are of major importance for one or two countries, such as puffins, *Fratercula arctica*, in Iceland and the Faroes; fulmars, *Fulmarus glacialis*, in the Faroes; dovekies, *Alle alle*, in Greenland; and auklets, Family Alcidae, in Alaska (Figure 19.1).

Country/Region	No. of species harvested	Most important species	Est. annual seabird harvest
USA/Alaska[1]	>25	Auklets, Murres	30,000 (2001–2005)
Canada	8	Murres, C. eider	260,000 (2002–2008)
Faroes	9	Fulmar, Puffin	65,000–240,000
Finland	6	Oldsquaw, C. eider	31,000 (2000–2004)
Greenland	19	T.-B. murre, C. eider, Dovekie, Terns? (eggs)	153,000–220,000 (2002–2006)
Iceland	19	Puffin, C. murre, C. eider (down, eggs)	158,000–285,000 (2002–2007)
Norway/Svalbard	5/4	Gulls/B. guillemot	4,000/150 (1995–2008)
Russia (West)	~10	Eiders, Murres, Gulls	?
Russia (East)	~20	Eiders, Alcids, Gulls, Terns, Comorants	Eiders (50–62,000), other seabirds (~100,000, mainly illegal) ~100,000 (mainly illegal)

1. Sea ducks not included; 2. Except for Common Eider; * Table updated according to personal communications [10], and [11].
(B. guillemot = black guillemot; C. eider = common eider; C. murre = common murre; T.B. murre = thick-billed murre).

Figure 19.1: Status and trends of seabird harvest in the Arctic (including sea ducks). Information from [6]*.

Concerns for the future

The distribution of some of the Arctic marine food sources upon which seabirds are dependent is changing as a result of climate change. In the North Atlantic, a northward shift in the distribution of *Calanus* copepods is affecting the availability of certain fish species of major importance for the seabirds, particularly sand eels, *Ammodytes* spp. These changes are believed to be involved in massive breeding failures among seabirds in Iceland, the Faroes, Scotland, and Norway, starting in 2004 [12]. This situation is part of the explanation for the declining trend in harvested seabirds in the Faroes and in Iceland (Figure 19.1). Analyses on a larger geographic scale have demonstrated that murre species are sensitive to climate change on a circumpolar level, but also showed that even closely related species may react differently to a given temperature change [13].

Climate change will complicate the sustainable use of seabird populations. Previous harvest levels may no longer be sustained for some species, while sustainable levels may increase for others. Future management of sustainable harvest levels will require better documentation of harvest levels and population numbers in several regions of the Arctic and the need for cooperative research, monitoring, and outreach will further increase [6]. The involvement of local users in collecting information about seabird populations and related biology can be of considerable value for their management. Should stronger harvest restrictions become necessary, direct involvement of coastal communities will facilitate such changes.

If sea ice continues to diminish as a consequence of climate change in the Arctic, access to the region will become easier and less costly in the future. This will likely increase the attractiveness of the region for further oil and gas development and may apply additional stressors to the Arctic environment, including seabirds [14].

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Est. annual egg harvest	Overall trend in harvest	Reason for change
145,000 (2001–2005)	Variable annually, no trend evident (1995–2005)	Survey methods may not be comparable
Some	Decreasing (1980–2002)	Regulation and fewer hunters
1,000–12,000	Decreasing (1980–2006)	Regulation and decreasing pop.
Banned since 1962	Decreasing (1995–2005)	Decreasing pop. and regulation
6,600 (2006)	Decreasing (1993–2006)	Regulation and fewer hunters
Many	Decreasing2 (1995–2007)	Decreasing pop[2].
Some	Stable (1995–2008)	–
Some 1000s (<10,000) (illegal)	Increase in 1990s, now stable or decreasing	Changing law enforcement and social-economic situation
~100,000 (mainly illegal)	Decrease in early 1990s and gradual increase in 2000s	Changing law enforcement and social-economic situation