

State of the Arctic Marine Biodiversity Report

UPDATE SEABIRDS

Circumpolar Seabird Expert Group (CBird)
CBMP-Marine

2021



Thick-billed murre perched on glacial ice in Norway, Svalbard. Photo credit: Danita Delimont/Shutterstock.com

In 2017, the State of the Arctic Marine Biodiversity Report (SAMBR) synthesized data about biodiversity in Arctic marine ecosystems around the circumpolar Arctic. SAMBR highlighted observed changes and relevant monitoring gaps using data compiled through 2015 (CAFF 2017). This document provides an update on the status of seabirds in the circumpolar Arctic using data from 2016–2019.

Seabirds are one focus of the Circumpolar Biodiversity Monitoring Program's (CBMP) marine monitoring work, along with sea ice biota, plankton, benthos, marine fishes, and marine mammals. Networks of experts have identified key elements, called Focal Ecosystem Components (FECs), of the Arctic marine ecosystem. Changes in the status of FECs likely indicate changes in the overall marine environment.

These updates were prepared by the Circumpolar Seabird Expert Group (CBird) of the Marine Expert Monitoring Group. CBird works to coordinate seabird monitoring, conservation, management and research activities around the Arctic.

BACKGROUND

Seabirds forage at sea but nest on land, which makes them an important link between the marine and terrestrial ecosystems and also makes them easier to monitor than some marine species. Many countries have long-term monitoring data for at least some of the seabird colonies found across the Arctic.

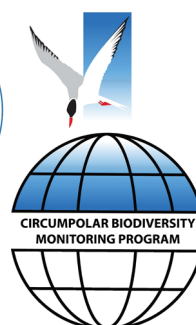
Of the 64 species of Arctic seabirds (Irons et al. 2015), CBird identified eight as priorities for monitoring (CAFF 2017). These eight species can be considered in five groups based on their feeding behavior, with an Atlantic, Pacific and/or circumpolar representative of each (Table 1). The five groups include: diving piscivores (fish eaters), surface piscivores (fish eaters), diving planktivores (plankton eaters), benthic feeders (that eat shellfish and other benthic animals), and omnivores.¹

¹Three of these species have also been identified through CAFF's Arctic Migratory Birds Initiative (AMBI) as priority species i.e., ivory gull, thick-billed murre and common eider.

The Circumpolar Biodiversity Monitoring Program (CBMP) is an adaptive monitoring program based on an international network of scientists, government agencies, Indigenous organizations and conservation groups working together to harmonize and integrate efforts to monitor the Arctic's living resources. The CBMP organizes its efforts around the major ecosystems of the Arctic: marine, freshwater, terrestrial and coastal.

In 2011, CBMP Marine Expert Monitoring Group published a circumpolar monitoring plan that describes how Arctic states would compile, harmonize, and compare results from existing Arctic marine biodiversity and ecosystem monitoring efforts (Gill et al. 2011).

CBMP is a cornerstone initiative of the Conservation of Arctic Flora and Fauna (CAFF), the biodiversity working group of the Arctic Council.



ARCTIC COUNCIL

Table 1. Seabird species selected as priority species for monitoring

FORAGING GUILD	COMMON NAME	SCIENTIFIC NAME	DISTRIBUTION
Omnivore	Glaucous gull	<i>Larus hyperboreus</i>	Circumpolar
	Ivory gull	<i>Pagophila eburnea</i>	Atlantic
Diving planktivore	Least auklet	<i>Aethia pusilla</i>	Pacific
	Little auk	<i>Alle alle</i>	Atlantic
Diving piscivore	Common murre	<i>Uria aalge</i>	Circumpolar
	Thick-billed murre	<i>Uria lomvia</i>	Circumpolar
Surface piscivore	Black-legged kittiwake	<i>Rissa tridactyla</i>	Circumpolar
Benthivore	Common eider	<i>Somateria mollissima</i>	Circumpolar

Seabird population sizes are often rough estimates, and trends may be based on monitored study plots rather than comprehensive counts. During the first SAMBR assessment, several of the monitored species showed widespread declines, particularly in the Atlantic Arctic. These included ivory gulls, which showed evidence of decline throughout most of their Arctic range. Seabird population changes are attributed to reduced ice cover and climate-associated shifts in their food supply (CAFF 2017). Kittiwakes and murres, however, appeared to be stable or increasing through 2015 in the Pacific Arctic. Common eiders were increasing or stable throughout most of their range (CAFF 2017).

UPDATED STATUS OF POPULATIONS AND MONITORING

This SAMBR update for seabirds is based on new information for 2016–2019. Most changes reflect access to improved population estimates, or improved data for monitoring trends, independent of recognized trends in population size. Thus, changes in population size for a given region may not always be consistent with changes in assessed trends.

MONITORING

Generally, the Atlantic Arctic is more intensively monitored than the Pacific, due to greater accessibility of

Please see the last page for photo description and credits.



Glaucous gull



Ivory gull



Least auklet



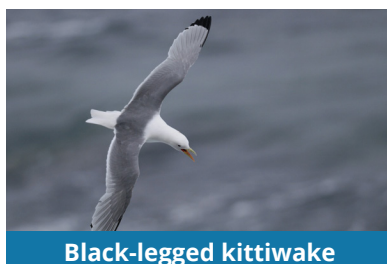
Little auk



Common murre



Thick-billed murre



Black-legged kittiwake



Common eider

colony sites and resources for monitoring, as well as gathering and documenting information. As in the first SAMBR, data gaps are most apparent for population information on planktivorous auklets (least auklet and little auk), and geographically for the Russian Pacific Arctic and Kara-Laptev region.

During the 2020 field season the COVID-19 pandemic restricted monitoring in several countries and regions, for instance in Canada and the United States. The financial aftermath of the pandemic and its implications for future monitoring funding remain a concern.

POPULATIONS

This new assessment continues to show instances of stable or increasing population trends in the Beaufort, Pacific Arctic, Arctic Archipelago, and Davis-Baffin areas, although there are additional unknown trends in those regions. For most of these regions, monitoring is sporadic or sparse.

As reported in 2015 (CAFF 2017), there were more declining population trends in the Atlantic Arctic, particularly for kittiwakes and both species of murres.



Thick-billed murres, Svalbard, Norway.
Photo credit: Philipp Konietzko/
Shutterstock.com



Figure 1. CBird monitors across 22 ecoregions around the Circumpolar Arctic. For the purposes of CBMP-Marine products, these data are compiled into the Arctic Marine Areas (AMAs) used in SAMBR (Gill et al. 2011).²

Ivory gull trends improved in two small populations (Canada and Greenland), but declined in others. Thus, within the Arctic Archipelago and Atlantic Arctic, population trends are different, and the trend is negative in the Kara-Laptev region, which holds the largest population.

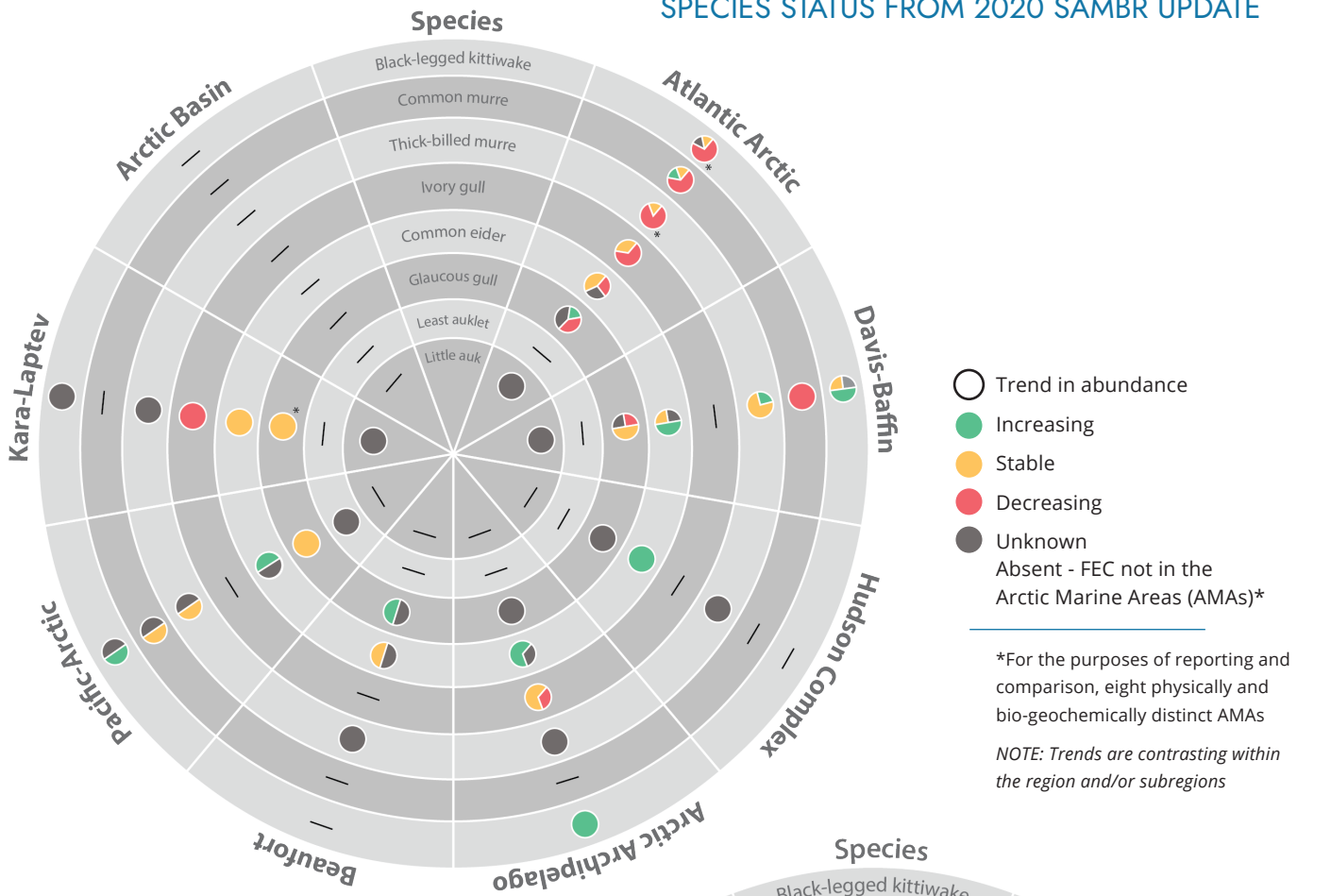
Common eiders, although generally doing well throughout all regions, changed from increasing to decreasing in two regions of the Atlantic Arctic.

The declines observed are consistent with wider changes in the marine ecosystem in the North Atlantic, suggesting that seabirds have been impacted by large scale environmental change (Frederiksen 2010, Frederiksen et al. 2013, Vihtakari et al. 2018). Another factor in more specific locations is fisheries bycatch, which might pose a risk for populations of diving seabirds, although a full assessment of the population consequences is challenging (Christensen-Dalsgaard et al. 2019).

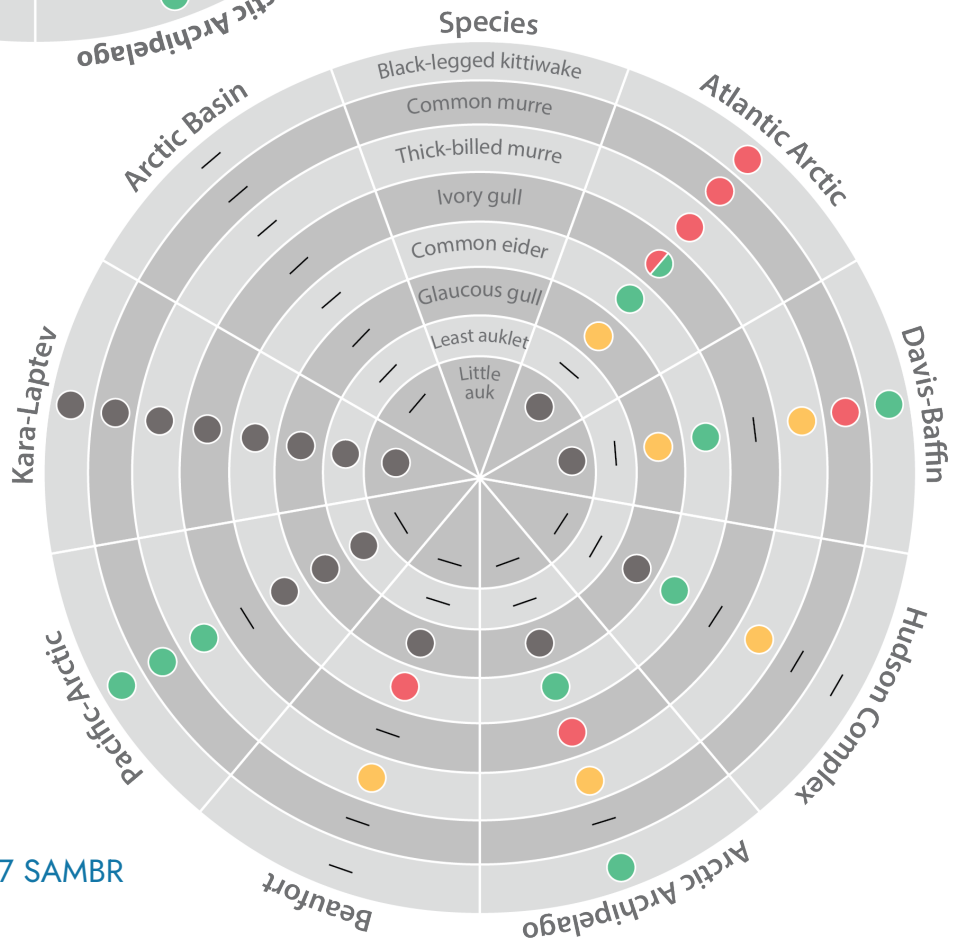
It must be noted that the regions extend over large areas and are not ecologically uniform. As a result, seabird population trends may not be consistent within a region, leading to a 'split' in trends. This applies to such large regions as the Atlantic and Pacific Arctic Arctic Marine Areas (AMAs).² For instance, in the Barents area (Atlantic Arctic) there is a decline of thick-billed murres and black-legged kittiwakes in areas influenced by Atlantic waters, whereas in the north-east, populations are stable or have increased in the short-term (Krasnov & Ezhov 2020).

²For the purposes of reporting and comparison, eight physically and bio-geochemically distinct Arctic Marine Areas (AMAs).

SPECIES STATUS FROM 2020 SAMBR UPDATE



SPECIES STATUS FROM 2017 SAMBR





KEY FINDINGS

The seabirds targeted for monitoring in this circumpolar effort continue to be impacted by climate-driven shifts in their food supplies and by the retreat of sea ice (Descamps et al. 2017, Hunt et al. 2018, Ramírez et al. 2017, Will et al. 2020). From 2016–2019, broad declines in Atlantic Arctic seabirds continued, with new population declines in some previously healthy populations of common eiders. In other cases, some of the previously declining small populations of ivory gulls have stabilized, although larger populations have declined in Kara-Laptev. Large data gaps still prevent a clear assessment of trends in planktivorous seabirds, and most seabirds in the Russian Arctic.

For monitoring and the planning of conservation measures, international collaboration is essential. For example, an Arctic Report Card was produced (Strøm et al. 2019) and an international pan-Arctic ivory gull survey has been conducted within CBird. For the black-legged kittiwake, an international conservation strategy and action plan has been developed by CBird (Johansen et al. 2020).

The views expressed in this peer-reviewed report are the responsibility of the authors of the report and do not necessarily reflect the views of the Arctic Council, its members or its observers, contributing institutions or funding institutions.

REFERENCES

- CAFF 2017. State of the Arctic Marine Biodiversity Report. Conservation of Arctic Flora and Fauna International Secretariat, Akureyri, Iceland. 978-9935-431-63-9.
- Christensen-Dalsgaard, S., Anker-Nilssen, T., Crawford, R., Bond, A., Már Sigurðsson, G., Glemarec, G., Snær Hansen, E., Kadin, M., Kindt-Larsen, L., Mallory, M., Merkel, F. R., Petersen, A., Provencher, J. & Bærum, K. M. 2019. What's the catch with lumpsuckers? A North Atlantic study of seabird bycatch in lumpsucker gillnet fisheries. *Biological Conservation*, Volume 240, December 2019, 108278. <https://doi.org/10.1016/j.biocon.2019.108278>, <https://www.sciencedirect.com/science/article/pii/S0006320719307025>.
- Descamps, S., Aars, J., Fuglei, E., Kovacs, K.M., Lydersen, C., Pavlova, O., Pedersen, Å.Ø., Ravolainen, V. & Strøm, H. 2017. Climate change impacts on wildlife in a High Arctic archipelago – Svalbard, Norway. *Glob Change Biol*, 23: 490-502. <https://doi.org/10.1111/gcb.13381>.
- Gill, M.J., Crane, K., Hindrum, R., Arneberg, P., Bysveen, I., Denisenko, N.V., Gofman, V., Grant-Friedman, A., Gudmundsson, G., Hopcroft, R.R., Iken, K., Labansen, A., Liubina, O.S., Melnikov, I.A., Moore, S.E., Reist, J.D., Sirenko, B.I., Stow, J., Ugarte, F., Vongraven, D., & Watkins, J. 2011. Arctic Marine Biodiversity Monitoring Plan, CAFF Monitoring Series Report No.3, April 2011. CAFF International Secretariat, Akureyri, Iceland. ISBN 1. 978-9979-9778-7-2.
- Hunt, G., Renner, M., Kuletz, K., Salo, S., Eisner, L., Ressler, P., Ladd, C., & Santora, J.A. 2018. Timing of sea-ice retreat affects the distribution of seabirds and their prey in the southeastern Bering Sea. *Marine Ecology Progress Series* vol. 593: 209-230 <https://doi.org/10.3354/meps12383>.
- Irons, D., Petersen, Æ, Anker-Nilssen, T., Artukhin, Y., Barrett, R., Boertmann, D., Gavrilov, M., Gilchrist, G., Hansen, E., Hario, M., Kuletz, K., Mallory, M., Merkel, F., Mosbech, A., Labansen, A., Olsen, B., Österblom, H., Reid, J., Robertson, G., Rönkä, M. & Strøm, H. 2015. Circumpolar Seabird Monitoring Plan. CAFF Monitoring Report No.17. CAFF International Secretariat, Akureyri, Iceland. ISBN: 978-9935-431-47-9.
- Johansen, M., Irgens, M., Strøm, H., Anker-Nilssen, T., Artukhin, Y., Barrett, R., Barry, T., Black, J., Danielsen, J., Descamps, S., Dunn, T., Ekker, M., Gavrilov, M., Gilchrist, G., Hansen, E., Hedd, A., Irons, D., Jakobsen, J., Kuletz, K., Mallory, M., Merkel, F., Olsen, B., Parsons, M., Petersen, Æ., Provencher, J., Robertson, G. & Rönkä, M. 2020. International Black-legged Kittiwake Conservation Strategy and Action Plan, Circumpolar Seabird Expert Group. Conservation of Arctic Flora and Fauna, Akureyri, Iceland. ISBN 978-9935-431-85-1.
- Krasnov, Yu.V. & Ezhov, A.V. 2020. The status of sea bird populations and factors determining their development in the Barents Sea. *Transactions of the Kola Science Centre. Oceanology series* 7: 226–244 (In Russian).

Ramírez, F., Tarrow, A., Hovinen, J. et al. 2017. Sea ice phenology and primary productivity pulses shape breeding success in Arctic seabirds. *Science Report* 7, 4500. <https://doi.org/10.1038/s41598-017-04775-6>.

Strøm, H., Boertmann, D., Gavrilo, M. V., Gilchrist, H. G., Gilg, O., Mallory, M., Mosbech, A. & Yannic, G. 2019. Ivory Gull: Status, Trends and New Knowledge. *Arctic Report Card – Update for 2019*. <https://arctic.noaa.gov/Report-Card/Report-Card-2019/ArtMID/7916/ArticleID/836/Ivory-Gull-Status-Trends-and-New-Knowledge>.

Vihtakari, M., Welcker, J., Moe, B., Chastel, O., Tartu, S., Hop, H., Bech, C., Descamps, S., Gabrielsen, & G.W. 2018. Black-legged kittiwakes as messengers of Atlantification in the Arctic. *Scientific Reports*. 1178. V. 8 (1) [doi.10.1038/s41598-017-19118-8](https://doi.org/10.1038/s41598-017-19118-8).

Will, A., Takahashi, A., Thiebot, J.B., Martinez, A., Kitaiskaia, E., Britt, L., Nichol, D., Murphy, J., Dimond, A., Tsukamoto, S., Nishizawa, B., Niizuma, Y., & Kitaysky, A. 2020. The breeding seabird community reveals that recent sea ice loss in the Pacific Arctic does not benefit piscivores and is detrimental to planktivores. *Deep Sea Research Part II: Volumes 181–182*. <https://doi.org/10.1016/j.dsr2.2020.104902>.

DATA SOURCES AND ACCESS

Data generated by CBMP-Marine are provided in the Arctic Biodiversity Data Service (abds.is).

This report should be cited as: CAFF (2021). State of the Arctic Marine Biodiversity Report Update: Seabirds. Conservation of Arctic Flora and Fauna International Secretariat: Akureyri, Iceland. <https://caff.is/seabirds-cbird>

Photo references for seabird grouping on page three, starting at the top, left to right: Glaucous gull on iceberg. Photo: Kathy Kuletz/USFWS; Ivory gull, Spitsbergen Island, Svalbard. Photo: LABETAA Andre/Shutterstock.com; Least auklet, Alaska. Photo: Nick Pecker/Shutterstock.com; Little auk, Alaska. Photo: Nick Pecker/Shutterstock.com; Group of Common murre. Photo: Arnau Soler/Shutterstock.com; Thick-billed murre, Svalbard, Norway. Photo: Philipp Konietzko/Shutterstock.com; Black-legged kittiwake. Photo: Dan Cushing/USFWS; Common eider brooding on its eggs. Photo: BMJ/Shutterstock.com



Common Eider, Norway. Photo credit: Alatair/Shutterstock.com