**AEWA Species Conservation Guidance for the**

**Atlantic Puffin**

***Fratercula arctica***

Agreement on the Conservation of

African-Eurasian Migratory Waterbirds (AEWA)

**AEWA Species Conservation Guidance** **for the**

**Atlantic Puffin**

***Fratercula arctica***

**May 2022**

**Produced by the AEWA Technical Committee**

**Compiled by Paul Buckley**

*This guidance has been produced to facilitate the implementation of the*

*AEWA Strategic Plan 2019-2027 (Objective 1, Target 1.3)*

*Prepared with funding from the Department for Environment, Food and Rural Affairs, United Kingdom*

Contents

[SUMMARY AND FUTURE PRIORITIES 4](#_Toc109817510)

[1. BASIC DATA 4](#_Toc109817511)

[2. THREATS/PROBLEMS AND RECOMMENDATIONS FOR CONSERVATION ACTION 5](#_Toc109817512)

[3. BIOLOGICAL ASSESSMENT 8](#_Toc109817513)

[4. REFERENCES 8](#_Toc109817514)

**SUMMARY AND FUTURE PRIORITIES**

The Atlantic Puffin is a globally threatened (listed as Vulnerable on the IUCN Red List) seabird whose decline is increasingly driven by the impacts of climate change, interfacing with an already stressed population. It is subject to historical, and in some cases, current over-exploitation of prey stocks by fisheries as well as more local impacts such as invasive non-native predators and a recent expansion of offshore wind energy and other marine infrastructure projects.

Much national and local conservation effort is underway to improve the conservation status of this popular species. This needs to be backed by international collaboration in a number of key areas, most of which will benefit a host of seabirds and other marine biodiversity. In particular:

* Develop climate change adaptation measures to mitigate against the effects of ongoing impacts of climatic change, principally through reducing other parallel threats to key populations.
* Designation and management of additional Marine Protected Areas, including those in international waters, most urgently the proposed North Atlantic Current and Evlanov Seamount MPA (NACES) where an estimated 1 million Puffins feed.
* Collaboration in fisheries management to reduce the most damaging exploitation, and better manage and recover remaining fish populations, including through closures and catch limits.
* Mitigating the impacts of offshore wind energy development through mapping of feeding area and careful siting of new infrastructure and using new technologies to enable energy generation further away from the most sensitive breeding and feeding areas.
* International collaboration to research and ensure better understanding of their movements within and outside the breeding season, and the survival and productivity of breeding populations. Puffin is a key target in the Action Plan for Seabirds in Western-Nordic Areas (TemaNord 2010).

**1. BASIC DATA**

Species name: Atlantic Puffin (*Fratercula arctica*)

Range States for the East Atlantic population (Principal range states in **Bold**)

**Denmark (Faroes,** East Greenland**),** Finland, France, **Iceland, Ireland, Norway** (including Svalbard**)**, Russia (including Novaya Zemlya), Spain, Sweden, **United Kingdom,** International Waters (and some wintering and as vagrants in other states).

The West Atlantic population outside of the AEWA area, encompasses NE North America, through to West Greenland and together holds less than 10% of the global population (Harris and Wanless 2011).

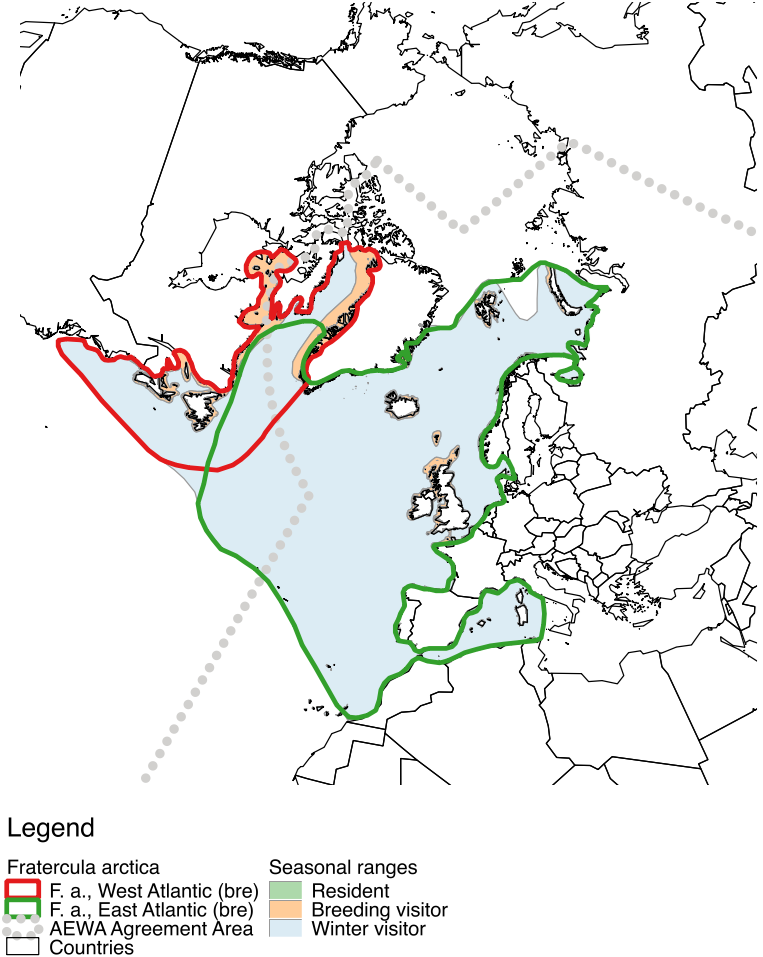
Range map copied from AEWA Technical Committee document [AEWA/TC 15.9](https://www.unep-aewa.org/sites/default/files/document/aewa_tc15_9_delineation_biogeographic_populations_atlantic_puffin_en.pdf).

International legal status

Global IUCN Status: Vulnerable (Criteria A4abcde) (last reviewed 2018).

AEWA Table 1: Column A 1b

Bern Convention: Annex III



*Range map of the Atlantic Puffin (Fratercula arctica).*

**2. THREATS/PROBLEMS AND RECOMMENDATIONS FOR CONSERVATION ACTION**

**Table 1. Threats/problems and Recommendations for Action**

\* Information in Table 1 adapted from BirdLife International threat assessment: [Atlantic Puffin (*Fratercula arctica*) - BirdLife species factsheet](http://datazone.birdlife.org/species/factsheet/atlantic-puffin-fratercula-arctica/details). Amended Threat codes are highlighted in in Red, based on discussions with species experts. These scores/ratings are for the species as a whole, while for individual local and national populations a higher level may apply.

|  |  |  |
| --- | --- | --- |
| ***Threat/problem & description*** | ***Threat/problem level[[1]](#footnote-1)*** | ***Recommendation for Action*** |
| Biological resource use - Fishing & harvesting aquatic resources - Unintentional effects: large scale (species is not the target) (5.4.4):  Fish populations fluctuate for many reasons inc. natural and man-induced temperature change and fishing pressure. Loss of fish stocks is key in North Sea. (Sandvik *et al* 2005, Hansen *et al* 2021).  There may be an impact of by-catch although the scale is unknown.  Biological resource use Hunting & collecting terrestrial animals - Intentional use (species is the target) (5.1.1) | Medium 7  Unknown  Low 5 | Manage fisheries to ensure long-term sustainability of key stocks (e.g., sand eels, sprats, herring, capelin, krill). This to include area closures and commensurate reductions in total harvest, and allowance for seabird feeding needs in setting commercial catch limits.  Further identify important sites for this species, particularly in offshore regions and designation as marine protected areas, including in international waters (priority is NACES).  Establish observer schemes for seabird bycatch and prepare National/Regional plans of action on seabird bycatch. (All countries but esp. North Sea area)  Iceland and Norway initiated voluntary hunting bans when populations declined although continues in North Iceland, and at reduced level in Faroes. Monitor use and impact and seek legal assurances of sustainable hunting (Iceland, Denmark - Faroes) |
| Climate change & severe weather – temperature extremes (11.3)  Climate change is the primary pressure on the population through changing patterns of food availability forcing adults to fly further for fewer prey, leading to lower productivity, and in some cases higher adult mortality (Sandvik et al 2005, Hansen et al 2021).  Climate change & severe weather – storms and flooding (11.4)  Winter storms increasing the severity of seabird die-off events (Harris and Elkins 2013, Anker-Nilssen *et al* 2017). | High 8  High 8  Medium 6 | Protect prey by other means e.g., Fisheries regulation and control in MPAs around breeding colonies. Continued protection of prey habitat such as sandbanks.  Ensure that spatial and temporal protection (national laws and international agreements) takes account of changes in seabird migration routes and timing.  Maintain beached-bird monitoring and colony census to understand adult survival/mortality rates. Continue to use GPS and geolocators to increase knowledge of feeding near breeding colonies and use of wintering areas respectively (All countries). Use new techniques to improve knowledge of productivity e.g. time lapse cameras and utilise citizen science where possible. |
| Energy production & mining – renewable energy (3.3)  Windfarms projected to potentially have a major impact through collision and displacement from feeding areas. Impact could be high in some areas e.g., North Sea, less so elsewhere (Searle *et al* 2014). | Medium 6 | Further identify important sites for this species, particularly in offshore regions and designation and management as marine protected areas. (All countries). Longer term, improve technology to enable wind energy to decrease impact e.g., floating turbines (All countries but esp. UK) |
| Human intrusions & disturbance – recreational activities (6.1)  Breeding colonies are vulnerable to human disturbance which can cause desertion (Nettleship *et al* 2014). | Low 4 | Develop codes-of-conduct for more organised recreational activities. Control close access by boats during breeding season (e.g. tourism, research). (All countries) |
| Invasive and other problematic species, genes & diseases - Invasive non-native/alien species/diseases (8.1.2)  Historically this is a major determinant of Puffin distribution as whole colonies have gone extinct due to rats and (in Iceland) mink (Harris and Wanless 2011). | Medium 6 | Continue eradication of invasive predators from breeding colonies where feasible and in a prioritised order. (All countries) |
| Pollution – Garbage and solid waste (9.4)  Evidence of accumulations of e.g. cadmium and mercury but unclear of toxicity and impact.  Pollution Industrial and Military Effluents – Oil spills (9.2.1)  Locally can be very significant and high profile. Potential increase in future threat with development of arctic shipping routes. | Unknown  Low 5 | Continue Arctic Monitoring and Assessment Programme (AMAP) monitoring of seabird contaminants; include new contaminants and secure communication between seabird and contaminants research. (All countries)  Develop a system to monitor and predict impacts of offshore oil developments on important areas for the species, in particular, key wintering sites. Contingency plans for oil spills. Re-route tankers away from key areas as in Iceland (All countries). |

**3. BIOLOGICAL ASSESSMENT**

Habitat

The species is exclusively marine, found on rocky coasts and offshore islands (Nettleship *et al*. 2014). It nests on grassy maritime slopes, sea cliffs and rocky slopes. During the winter it is wide-ranging, found in offshore and pelagic habitats. Recent research including through GPS and GLS (geolocation) tagging has improved knowledge of movements of this and other seabirds and identified new areas where important concentrations occur (Narris *et al* 2012, Fayet *et al* (2017, 2021).

Population

The East Atlantic population is estimated to be 11,000,000 to 12,000,000 individuals, based on 2018 estimates (UNEP-AEWA 2021). The European population has been estimated at between 7,400,000 and 8,240,000 individuals (BirdLife International 2021). The global population size is estimated at 12–14 million mature individuals (Harris and Wanless 2011; Berglund and Hentati-Sundberg 2014).

This species has experienced rapid declines across most of its European range. The East Atlantic holds >90% of the global population, so the projected declines in Europe are globally significant. In some areas, declines have been severe, for example in Norway where the population in Røst fell from 1.41m to 274,000 between 1979 and 2019. There are an estimated 10,000 pairs maximum in Svalbard and probably a similar number but decreasing in the Russian arctic (Anker-Nilssen et al 2020). There has been a 40% loss in Iceland since 2003 (Keller et al 2020, Hansen et al *in press*). The population size in Europe is estimated and projected to decrease by 50-79% over three generations (BirdLife International 2015).  The much smaller West Atlantic population is believed to be stable or increasing. It is very tentatively suspected that overall declines may fall in the range 30-49% over three generations or c. 42 years (BirdLife International 2021, Bird et al 2020).

**4. REFERENCES**

**Anker-Nilssen, T., Aarvak, T. and Bangjord, G. 2003.** Mass mortality of Atlantic Puffins in Norway. *Atlantic Seabirds* 5(2): 57-72.

**Anker-Nilssen, T.; Aarvak, T. 2006.** Long-term studies of seabirds in the municipality of Røst, Nordland. Results with focus on 2004 and 2005. *Norwegian Institute for Nature Research, NINA Report* 133.

**Anker-Nilssen, T.; Lorentsen, S.-H. 1990.** Distribution of Puffins Fratercula arctica feeding off Røst, northern Norway, during the breeding season, in relation to chick growth, prey and oceanographical parameters. *Polar Research* 8: 67-76.

**Anker-Nilssen, T., Harris, M.P., Kleven, O. & Langset, M. 2017.** Status, origin and population impacts of Atlantic Puffins killed in a mass mortality event in SW Norway early 2016. Seabird 30: 1-14

**Anker-Nilssen, T., Barrett, R., Christensen-Dalsgaard, S., Dehnhard, N., Descamps, S., Systad, G. H., Moe, B., Reiertsen, T. K., Bustnes, J. O., Erikstad, K.-E., Follestad, A., Hanssen, S. A., Langset, M., Lorentsen, S.-H., Lorentzen, E., & Strøm, H. 2020.** Key-Site Monitoring in Norway 2019, Including Svalbard and Jan Mayen. *SEAPOP Short Report*, *1–2020*.

**Barrett, R.T. 2015.** Atlantic Puffin *Fratercula arctica* chick growth in relation to food load composition. *Seabird* 28: 17-29.

**Barrett, R.T., Anker-Nilsson, T., Rikardsen, F., Valde, K., Røv, N. and Vader, W. 1987.** The food, growth and fledging success of Norwegian puffin chicks Fratercula arctica in 1980-1983. *Ornis Scandinavica* 18: 73-83.

**Berglund, P.A.; Hentati-Sundberg, J. 2014.** Arctic Seabirds Breeding in the African-Eurasian Waterbird Agreement (AEWA) Area: Status and Trends 2014. *AEWA Conservation Status Report (CSR6) Background Report.*

**Bird, J. P., Martin, R., Akçakaya, H. R., Gilroy, J., Burfield, I. J., Garnett, S. T., Symes, A., Taylor, J. Şekercioğlu C. H. & Butchart, S. H. M. 2020.** Generation lengths of the world's birds and their implications for extinction risk. *Conservation Biology* 34(5): 1252-1261.

**BirdLife International. 2000.***The Development of Boundary Selection Criteria for the Extension of Breeding Seabird Special Protection Areas into the Marine Environment.* OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic. Vlissingen (Flushing).

**BirdLife International 2021.** *European Red List of Birds.* Luxembourg: Publications Office of the European Union. [BirdLife-European-Red-List-of-Birds-2021.pdf](https://www.birdlife.org/wp-content/uploads/2021/10/BirdLife-European-Red-List-of-Birds-2021.pdf)

**BirdLife International and Handbook of the Birds of the World 2020.** Bird species distribution maps of the world. Version 2020.1. Available at <http://datazone.birdlife.org/species/requestdis>.

**BirdLife International 2022** Species factsheet: *Fratercula arctica*. Downloaded from [http://www.birdlife.org](http://www.birdlife.org/)

**Bradbury, G.; Trinder, M.; Furness, B.; Banks, A.N.; Caldow, R.W.G.; Hume, D. 2014.** Mapping seabird sensitivity to offshore wind farms. *PLoS ONE*9(9): e106366.

**Breton, A.R., and Diamond, A.W. 2014.** Annual survival of adult Atlantic Puffins *Fratercula arctica* is positively correlated with Herring *Clupea harengus* availability. *Ibis* 156(1): 35-47.

**Burger, A.E. and Simpson, M. 1986.** Diving depths of Atlantic puffins and common murres. *Auk* 103: 828-830.

**Camphuysen, K.C.J. 2003.** Characteristics of Atlantic Puffins *Fratercula arctica* wrecked in the Netherlands. *Atlantic Seabirds* 5(1): 21-29.

**Corkhill, P. 1973.** Food and feeding ecology of puffins. *Bird Study* 20(3): 207-220.

**del Hoyo, J.; Elliott, A.; Sargatal, J. 1996.** *Handbook of the Birds of the World, vol. 3: Hoatzin to Auks*. Lynx Edicions, Barcelona, Spain.

**Diershke, V., Furness, R.W. and Garthe, S. 2016**  Seabirds and offshore wind farms in European waters: Avoidance and attraction [*Biological Conservation*](https://www.sciencedirect.com/science/journal/00063207)[Volume 202](https://www.sciencedirect.com/science/journal/00063207/202/supp/C),  Pages 59-68

**Durant, J.; Anker-Nilssen, T.; Stenseth, N. C. 2003.** Trophic interactions under climate fluctuations: the Atlantic puffin as an example. *Proceedings of the Royal Society of London Series B* 270: 1461-1466.

**Durant, J.M., Anker-Nilssen,T. and Stenseth, N.C. 2006.** Ocean climate prior to breeding affects the duration of the nestling period in the Atlantic puffin. *Biology Letters* 2: 628-631.

**Fauchald, P.; Anker-Nilssen, T.; Barrett, R. T.; Bustnes, J. O.; Bårdsen, B. J.; Christensen-Dalsgaard, S.; Descamps, S.; Engen, S.; Erikstad, K. E.; Hanssen, S. A.; Lorentsen, S.-H.; Moe, B.; Reiertsen, T. K.; Strøm,, H.; Systad, G. H. 2015.** The status and trends of seabirds breeding in Norway and Svalbard. *Norwegian Institute for Nature Research, NINA Report* 1151.

**Fayet, A.L et al 2017.** Ocean-wide Drivers of Migration Strategies and Their Influence on Population Breeding Performance in a Declining Seabird. *Current Biology* 27, 3871–3878

**Fayet, A.L et al 2021.** Local prey shortages drive foraging costs and breeding success in a declining seabird, the Atlantic puffin. *Journal of Animal Ecology* 2021;00:1–13.

**Furness, R.W., Wade, H.M.and Masden, E.A. 2013.** Assessing vulnerability of marine bird populations to offshore wind farms [Journal of Environmental Management](https://www.sciencedirect.com/science/journal/03014797) [Volume 119](https://www.sciencedirect.com/science/journal/03014797/119/supp/C), 15, Pages 56-66

**Hansen, E. S., Sandvik, H., Erikstad, K. E., Yoccoz, N., Anker-Nilssen, T., Bader, J., Descamps, S., Hodges, K., Mesquita, M. d. S., Reiertsen, T. K. & Varpe, Ø. V. 2021.** Centennial relationships between ocean temperature and Atlantic puffin production reveal shifting decennial trends. *Global Change Biol* 27(16). <http://dx.doi.org/10.1111/gcb.15665>

**Harris, M. and Elkins, N. 2013.** An unprecedented wreck of Puffins in eastern Scotland in March and April 2013. *Scottish Birds* 33(2): 157-159.

**Harris, M. P.; Bogdanova, M. I.; Daunt, F.; Wanless, S. 2012.** Using GPS technology to assess feeding areas of Atlantic Puffins Fratercula arctica. *Ringing and Migration* 27: 43-49.

**Harris, M. P.; Leopold, M. F.; Jensen, J.-K.; Meesters, E. H.; Wanless, S. 2015.** The winter diet of the Atlantic Puffin Fratercula arctica around the Faroe Islands. *Ibis* 157: 468-479.

**Harris, M. P.; Newell, M. A.; Wanless, S.; Gunn, C. M.; Daunt, F. 2013*.*** *Status of the Atlantic Puffin Fratercula arctica on the Isle of May National Nature Reserve in 2013.* Report by Centre for Ecology & Hydrology to Scottish Natural Hertiage, Cupar (UK).

**Harris, M.P. and Hislop, J.R.G. 1978.** The food of young puffins. *Journal of Zoology* 185: 213-236.

**Harris, M.P. and Wanless, S. 1986.** The food of young razorbills on the Isle of May and a comparison with that of young guillemots and puffins. *Ornis Scandinavica* 17: 41-46.

**Harris, M.P. and Wanless, S. 2011.** *The Puffin*. Poyser.

**Harris, M.P.; Riddiford, N.J. 1989.** The food of some young seabirds on Fair Isle in 1986-88. *Scottish Birds* 15: 119-125.

**Hislop, J.R.G. and Harris, M.P. 1985.** Recent changes in the food of young puffins (Fratercula arctica) on the Isle of May in relation to fish stocks. *Ibis* 127: 234-239.

**Keller,V., Herrando,S.,Vorisek,P., et al 2020.**  *European Breeding Bird Atlas 2: Distribution, Abundance and Change.* European Bird Census Council & Lnyx Edicions, Barcelona.

**Kersten, O. et al 2020.** *Complex population structure of the Atlantic puffin revealed by whole genome analyses* bioRxiv preprint doi: <https://doi.org/10.1101/2020.11.05.351874>

**Lock, J. 2006.** Eradication of brown rats *Rattus norvegicus* and black rats *Rattus rattus* to restore breeding seabird populations on Lundy Island, Devon, England. *Conservation Evidence* 3: 111-113.

**Martin, A.R. 1989.** The diet of Atlantic puffin Fratercula arctica and northern gannet Sula bassana chicks at a Shetland colony during a period of changing prey availability. *Bird Study* 36(3): 170-180.

**Martin, G.R., Wanless, S. 2015.** The visual fields of Common Guilemots *Uria aalge* and Atlantic Puffins *Fratercula arctica*: foraging, vigilance and collision vulnerability. *Ibis* 157: 798-807.

**Melillo, J. M., Richmond T. T. C. and Yohe, G. W. 2014.** Extreme Weather. In: *Highlights of Climate Change Impacts in the United States: The Third National Climate Assessment*. U.S. Global Change Research Program.

**Miles, W.T.S., Mavor, R., Riddiford, N.J., Harvey, P.V., Riddington, R., Shaw, D.N., Parnaby, D. and Reid, J.M. 2015.** Decline in an Atlantic Puffin Population: Evaluation of Magnitude and Mechanisms. *PLoS ONE* 10(7): e0131527.

**Morley, T. I., Fayet, A. L., Jessop, H., Veron, P., Veron, M., Clark, J. A., & Wood, M. J. 2017.** The seabird wreck in the Bay of Biscay and South-Western Approaches in 2014: A review of reported mortality. *Seabird*, *29*, 22–38.

**Nettleship, D.N., Kirwan, G.M., Christie, D.A. and de Juana, E. 2014.** Atlantic Puffin (*Fratercula arctica*). In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D.A. and de Juana, E. (eds), *Handbook of the Birds of the World Alive*, Lynx Edicions, Barcelona.

**Newell, M., Harris, M.P., Gunn, C.M., Burthe, S., Wanless, S. and Daunt, F. 2016.** *Isle of May seabird studies in 2013.* JNCC, Peterborough, UK.

**Pearce-Higgins, J.W. & Green, R.E. 2014.** *Birds and Climate Change: Impacts and Conservation Solutions*. Cambridge University Press, Cambridge.

**Pearson, T.H. 1968.** The feeding ecology of sea-bird species breeding on the Farne Islands, Northumberland. *Journal of Animal Ecology* 37: 521-552.

**Rodway, M.S., Montevecchi, W.A., Chardine, J.W. 1996.** Effects of investigator disturbance on breeding success of Atlantic Puffins *Fratercula arctica*. *Biological conservation* 76: 311-319.

**Rogan, E., and Mackey, M. 2007.** Megafauna bycatch in drift nets for albacore tuna (*Thunnus alalunga*) in the NE Atlantic. *Fisheries Research* 86: 6-14.

**Sandvik, H., Erikstad, K.E., Barrett, R.T. and Yoccoz, N.G. 2005.** The effect of climate on adult survival in five species of North Atlantic seabirds. *Journal of Animal Ecology* 74(5): 817-831.

**Searle, K., Mobbs, D., Butler, A., Bogdanova, M., Freeman, S., Wanless, S. & Daunt, F. 2014.**  *Population consequences of displacement from proposed offshore wind energy developments for seabirds breeding at Scottish SPAs (CR/2012/03)*. Final Report to Marine Scotland Science.

**Stempniewicz, L. and Jensen, J-K. 2007.** Puffin harvesting and survival at Nólsoy, The Faeroes. *Ornis Svecica* 17: 95-99.

**Stone, C.J., Harrison, N.M., Webb, A. & Best, B.J. 1992.** *Seabird distribution around Skomer and Skokholm Islands, June 1990.*

**Stone, C.J., Webb, A., Barton, T.R. & Gordon, J.R.W. 1993.** Seabird distribution around Skomer and Skokholm Islands, June 1992.

**Tasker, M. L., Camphuysen, C. J., Cooper, J., Garthe, S., Montevecchi, W. A., and Blaber, S. J. M. 2000.** The impacts of fishing on marine birds. *ICES Journal of Marine Science* 57(531-547).

**TemaNord. 2010.** *Action Plan for Seabirds in Western-Nordic Areas. Report from a workshop in Malmö, Sweden, 4-5 May 2010.* Nordic Council of Ministers, Copenhagen.

**Thorup, S.H., Jensen, J-K., Petersen, K.T. and Kasper, D.B. 2014.** *Færøsk Trækfugleatlas. The Faroese Bird Migration Atlas*. Faroe University Press, Tórshavn.

**UNEP-AEWA 2019.** Delineation of biogeographic populations of the Atlantic Puffin (*Fratercula arctica*): Proposal to change population delineations in *AEWA Technical Committee recommendations in the 15th meeting of the Standing Committee.*

**UNEP-AEWA 2021.** *Report on the conservation status of migratory waterbirds in the agreement area - 8th Edition* <https://www.unep-aewa.org/en/document/report-conservation-status-migratory-waterbirds-agreement-area-8th-edition>

**Webb, A., Tasker, M.L. and Greenstreet, S.P.R. 1985.** *The distribution of guillemots (Uria aalge), razorbills (Alca torda) and puffins (Fratercula arctica) at sea around Flamborough Head, June 1984*.

**Wetlands International 2021.** [Critical Sites Network Tool 2.0 (wetlands.org)](http://critical-sites.wetlands.org/en/species/22694927?zoom=3&lat=64.19617830800536&lng=-13.652336597442629&view=map)

**Wilhelm SI, Mailhiot J, Arany J, Chardine JW, Robertson GJ, Ryan PC. 2015.** Update and trends of three important seabird populations in the western North Atlantic using a geographic information system approach. *Marine Ornithology* 43: 211-222.

**Conservation Evidence references (**[**https://www.conservationevidence.com**](https://www.conservationevidence.com/)**):**

[Reducing the density of breeding gulls influences the pattern of recruitment of immature Atlantic puffins *Fratercula arctica* to a breeding colony](https://www.conservationevidence.com/individual-study/20)

[Supplementary feeding of young puffins, *Fratercula arctica*](https://www.conservationevidence.com/individual-study/1362)

[Re-establishment of Atlantic puffins (*Fratercula arctica*) at a former breeding site in the Gulf of Maine](https://www.conservationevidence.com/individual-study/1468)

[How to prioritize rat management for the benefit of petrels: a case study of the UK, Channel Islands and Isle of Man](https://www.conservationevidence.com/individual-study/1611)

[Eradication of brown rats *Rattus norvegicus* and black rats *Rattus rattus* to restore seabird populations on Lundy Island, Devon, England](https://www.conservationevidence.com/individual-study/2241)

[Supplementary feeding increases fledging weight, late growth and peak weights in Atlantic puffin *(Fratercula arctica*) chicks](https://www.conservationevidence.com/individual-study/3310)

[Educational programs in Canada significantly increase nesting seabird populations](https://www.conservationevidence.com/individual-study/3159)

1. IUCN (Red List) Threats Classification Scheme [↑](#footnote-ref-1)