species factsheet

| species introduction |

Common name: Adelie penguin

Scientific name: *Pygoscelis adeliae*

Description: 71cm high; black back, tail and head; abdomen and breast white; reddish bill, thick covering of feathers; iris dark, white eye-ring; fairly long tail.

Geographical distribution: Circumpolar, largely restricted to Antarctica.

Interesting facts: In 1840, the French explorer Jules Dumont d'Urville named them for his wife, Adèle. Unlike most other species of penguins, the Adelie penguin does not moult when at the colony, but rather on ice floes.

Recent research has revealed that since 1983 the population on the island of Beaufort has increased from 34,000 to almost 64,000. This success is attributed to the local rise of temperature resulting in a more rapid retreat of the glacial-ice and snow. This enables the birds to extend their nesting grounds, which are located on bare rock and sand.

| status in the wild |

According to the IUCN Red-list, the species is listed as Near Threatened (2012).

| species reproduction |

The birds arrive at the colony in September / October. Most laying takes place in November. The species is colonial, on occasions forming enormous aggregations. They sometimes nest beside conspecifics, but usually in discrete sectors. The nests are packed very close together. The nest is a small depression lined with pebbles. They lay two eggs; a replacement laying can occur, but with only one egg. Incubation is carried out by both sexes for 30 to 43 days, with stints of 7-23 days (the females sometimes take a shorter initial shift).

The first down of the chick is coloured pale grey and much darker on the head. The second down is dark brown. They form crèches at 16 to 19 days and the chicks fledge at an age of 50 to 56 days. They reach sexual maturity by 8 years, possibly before, but only rarely at five and exceptionally at three years. The overall breeding success is about 50% (Cape Royds).

| species habitat |

The Adelie penguin is a marine species. It nests on ice-free rocky coasts, tending to occupy higher ground than Gentoo penguins. They can often be found in extensive open areas to accommodate typically large colonies. These colonies can also be far from the open sea.

| species food |

The Adelie penguin is an inshore feeder. Their prey mainly consists of krill (*Euphausia superba, E.crystallorophias*), with smaller quantities of fish, amphipods and cephalopods. They capture their prey by means of pursuit-diving. They normally forage at levels less than 20 meters down. They feed mostly at night.

| threats |

Adelie penguins are thought to be threatened by the effects of projected climate change, primarily through future decreases in sea ice concentration, as affected by wind speed and persistence, as well as associated changes in other climatic variables such as precipitation (Ainley *et al*. 2010). Reduced suitability of nesting habitat could result from an increase in the incidence of severe snowfall. In addition, annual migration and winter survival may be negatively affected by decreases in sea ice coverage at northern latitudes where the species requires a few hours of daylight in each 24-hour period (Ainley *et al*. 2010, Ballard *et al*. 2010).

The numbers are increasing in the Ross Sea region, decreasing in the Peninsula region, with the net global population increasing overall (Ainley *et al*. 2010). However, analyses based on the modelling of climate effects suggest that the population could start to decline in a few decades (Ainley *et al*. 2010, D. Ainley in litt. 2012). These declines may only start after a warming of 2°C above pre-industrial levels are reached however, overall trends will potentially be positive before this point (D. Ainley in litt. 2012). Nevertheless BirdLife International has cautiously projected a population decline approaching 30% over the next three generations, factoring in the potential for negative impacts to take place within this timescale, as well as substantial uncertainties over climate predictions and the adaptability of the species.

The location of research stations near colonies has led to reductions in suitable ground for breeding. Excessive visits to colonies and disturbance caused by aircraft movements can also cause problems (del Hoyo *et al*. 1992), although the impact of disturbance in relation to environmental conditions appears to vary with location (Bricher *et al*. 2008). Oil-pollution and fishing (for krill and finfish) also pose threats (D. Ainley in litt. 2012).

| conservation |

Conservation Actions Underway

This is the most studied penguin species (del Hoyo *et al*. 1992), and is the subject of on-going research. Some colonies are located within protected areas. Human disturbance is strictly regulated.

Conservation Actions Proposed

Carry out surveys to obtain an improved and more up-to-date population estimate. Continue to monitor population trends. Continue to closely monitor trends related to the extent and persistence of sea ice, and associated climatic variables. Carry out further research into the species' ecology to improve understanding of how environmental changes and human activities, such as fishing, will affect the population. Improve predictions of future environmental changes and how these will impact the species' population, and conduct research into the potential effects of fish and krill extraction (D. Ainley in litt. 2012). Continue international work to tackle the drivers of projected climate change.

| find out more |

Bibliography

Ainley, D.; Russell, J.; Jenouvrier, S.; Woehler, E.; Lyver, P. O'B.; Fraser, W. R.; Kooyman, G. L. 2010. Antarctic penguin response to habitat change as Earth's troposphere reaches 2°C above preindustrial levels. *Ecological Monographs* 80: 49-66.

Ballard G.; Toniolo, V.; Ainley, D. G.; Parkinson, C. L.; Arrigo, K. R.; Trathan, P. N. 2010. Responding to climate change: Adélie penguins confront astronomical and ocean boundaries. *Ecology* 91: 2056-2069.

Barbraud, C.; Weimerskirch, H. 2006. Antarctic birds breed later in response to climate change. *Proceedings of the National Academy of Sciences of the United States of America* 103(16): 6248-6251.

Bricher, P. K.; Lucieer, A.; Woehler, E. J. 2008. Population trends of Adélie penguin (*Pygoscelis adeliae*) breeding colonies: a spatial analysis of the effects of snow accumulation and human activities. *Polar Biology* 31: 1397-1407.

del Hoyo, J.; Elliot, A.; Sargatal, J. 1992. *Handbook of the Birds of the World, vol. 1: Ostrich to Ducks*. Lynx Edicions, Barcelona, Spain.

Forcada, J.; Trathan, P. N.; Reid, K.; Murphy, E. J.; Croxall, J. P. 2006. Contrasting population changes in sympatric penguin species in association with climate warming. *Global Change Biology* 12: 411-423.

Fretwell, P. T.; LaRue, M. A.; Morin, P.; Kooyman, G. L.; Wienecke, B.; Ratcliffe, N.; Fox, A. J.; Fleming, A. H.; Porter, C.; Trathan, P. N. 2012. An Emperor Penguin Population Estimate: The First Global, Synoptic Survey of a Species from Space. *PLoS ONE* 7(4).

Hinke, J. T.; Salwicka, K.; Trivelpiece, S. G.; Watters, G. M.; Trivelpiece, W. Z. 2007. Divergent responses of *Pygoscelis* penguins reveal a common environmental drive. *Oecologia* 153: 845-855.

IUCN. 2012. IUCN Red List of Threatened Species (ver. 2012.1). Available at: http://www.iucnredlist.org. (Accessed: 19 June 2012).

Trathan P. N.; Fretwell P. T.; Stonehouse, B. 2011. First Recorded Loss of an Emperor Penguin Colony in the Recent Period of Antarctic Regional Warming: Implications for Other Colonies. *PLoS ONE* 6(2).

Turner, J.; Comiso, J. C.; Marshall, G. J.; Lachlan-Cope, T. A.; Bracegirdle, T.; Maksym, T.; Meredith, M. P.; Zhaomin Wang; Orr, A. 2009. Non-annular atmospheric circulation change induced by stratospheric ozone depletion and its role in the recent increase of Antarctic sea ice extent. *Geophysical Research Letters* 36.

Weimerskirch, H.; Inchausti, P.; Guinet, C.; Barbraud, C. 2003. Trends in bird and seal populations as indicators of a system shift in the Southern Ocean. *Antarctic Science* 15: 249-256.

Woehler, E. J. 1993. *The distribution and abundance of Antarctic and Subantarctic penguins*. Scientific Commission on Antarctic Research, Cambridge, U.K.

Woehler, E. J.; Cooper, J.; Croxall, J. P.; Fraser, W. R.; Kooyman, G. L.; Miller, G. D.; Nel, D. C.; Patterson, D. L.; Peter, H.-U.; Ribic, S. A.; Salwicka, K.; Trivelpiece, W. Z.; Weimerskirch, H. 2001. *A statistical assessment of the status and trends of antarctic and subantarctic seabirds*.

Woehler, E. J.; Croxall, J. P. 1997. The status and trends of antarctic and sub-antarctic seabirds. *Marine Ornithology* 25: 43-65.

Zwally, H. J.; Comiso, J..C; Parkinson, C. L.; Cavalieri, D. J.; Gloersen, P. 2002. Variability of Antarctic sea ice 1979–1998. *Journal of Geophysical Research* 107.

Websites

http://www.birdlife.org/datazone/sowbsearchresults.php?a=st&SearchTerms=sphenisci

http://ibc.lynxeds.com/family/penguins-spheniscidae

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