

Atlantic Puffin in Iceland: Population changes and main threats

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1. The Icelandic population

The Atlantic Puffin *Fratercula arctica* is believed to be the most common breeding bird species in Iceland. Most recent estimate is 3-4 million pairs, or about half the world population. The population is distributed mostly on islands, among roughly 800 colonies, the largest about 200 thousand pairs. Many of the colonies are very small, only a few pairs. Some islands only have single pairs.

2. Data Availability

We reviewed available unpublished and published information on population changes. Colony sizes were estimated mainly from occupied burrow counts. Population development, ranging from 5 to 33 years, is reviewed for 19 colonies in S-, SW- and N-Iceland within the period 1975-2009. Data also exist on recent colonization at a number of previously unknown sites, such as the new island of Surtsey (Petersen 2009).



5. Main Conclusions

Despite various local threats a general increase took place in last decades of the 20th century, incl. formation of new colonies. The trend reversed in the 21st century, at least in South and West-Iceland. In North Iceland the population has continued to increase, but local movements were noticed. The available information points to different main food in the north compared to the south and west, Capelin vs. Sandeels.

6. Recommendations

- More focused data from a stratified monitoring program is urgently needed to follow trends in the Icelandic population.
- Continued censuses are needed for Icelandic Puffin colonies.
- Historical data sometimes exist and need to be collected.
- Comparative food study needs to be initiated.

3. Population changes

Prior to 2000 mean increase of 4.3%/yr was recorded at ten colonies, including the largest ones studied (>30000 pairs). The greatest increase was 15%/yr, which is exceptional and found in a colony established in 1975 (Petersen 2010).

More recently eight colonies showed a mean decline of 4.9%/yr. Same has taken place on the Westman Islands the largest Puffin colony aggregation in the world (Hansen 2009, Hansen & Gardarsson 2009).

No quantitative data are available for most Icelandic Puffin colonies.

4. Main threats

Historical data show various local factors relate to population declines, such as excessive hunting, introduced predators (Mink *Mustela vison* in particular), shifting sandy coastline, erosion, etc. More recently decline has been seen in Sandeels *Ammodytes* spp., a preferred Puffin food, possibly related to climate change (Gardarsson 2006). This is mostly taking place in South and West Iceland. Regional variations indicate differences in food, in North Iceland the main prey being Capelin *Mallotus villosus*.



Although other factors may also affect individual Puffin colonies, climate change and resulting effects on the food resources is currently the greatest potential threat to Icelandic Puffins.

References

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Changes between counts at some Puffin colonies

Colony	Period (no. yrs)	No. prs first year	No. prs latter year	Changes (%/yr)
North:				
Flatey on Skjálfandi	1980-2007 (27)	c160	6917	+15.00
Lundey on Skjálfandi	1984-2007 (22)	34812	39000	+0.52
Voladalstorfa on Tjörnes	1981-2006 (25)	1988	2600	+1.08
Lágey at Tjörnes	1981-2006 (25)	32957	43036	+1.07
Sandhólastöng on Tjörnes	1981-2006 (24)	520	170	-4.55
Háey by Tjörnes	1982-2006 (24)	4422	3800	-0.63
Bangastaðahöfn on Tjörnes	1981-2007 (25)	25300	15700	-1.89
Southwest:				
Akurey by Reykjavík	1989-2004 (15)	15000	19000	+1.59
Lundey by Reykjavík	1984-2004 (20)	3607	8579	+4.43
West:				
Heimri-Langey by Flatey	1995-2007 (12)	231	217	-0.52
Akurey by Flatey	2000-2007 (7)	118	97	-2.76
Hrólfsklettur by Flatey	2001-2007 (6)	385	197	-10.57
Klofningur by Flatey	2000-2009 (9)	85	26	-12.33
Böðvarsklettaflaga by Hergilsey	1996-2005 (9)	120	70	-5.81
Flataflaga in Sauðeyjar	2006-2007 (1)	30	10	-66.67
Klofningur in Svefneyjar	1982-1997 (15)	150	320	+5.18
Flatey in Breiðafjörður	1975-2008 (33)	17-21	162	+6.71
Akurey by Flatey	1995-2000 (5)	104	118	+2.56
Selsker by Flatey	1995-2009 (14)	55	112	+5.21

(from Petersen, Thorarinsson & Thorstensen, *in prep.*)

