

## Notes

### Kolbeinsey: Iceland's Arctic island

Troels Jacobsen

Poppelhaven 118 1B, DK-5240 Odense NØ, Denmark

Ian R. Stone

Scott Polar Research Institute, University of Cambridge,  
Lensfield Road, Cambridge CB2 1ER

Received October 2005

doi:10.1017/S0032247406215298

**ABSTRACT.** Kolbeinsey is a tiny volcanic island to the north of Iceland within the Arctic Circle. It has been much reduced in size in historic times due to erosion. It has considerable geopolitical importance with regard to fishery zones and the exploitation of other natural resources. It is, therefore, in Iceland's interests to ensure that it continues to exist, and measures have been taken to ensure this.

Kolbeinsey is located some 74 km (46 miles) northwest of the small, inhabited island of Grímsey, and 105 km (65 miles) from mainland Iceland. It is located at 67°08.9'N, 18°41.1'W, and hence is north of the Arctic Circle and well within the maximum extent of the winter drift ice in the North Atlantic. The island is Iceland's only wholly Arctic island: its other Arctic territory, Grímsey, is bisected by the Arctic Circle. Despite its small size, Kolbeinsey has an interesting history, leading back to the time of the early settlers of Iceland. It also has relevance to present-day geopolitics.

The island, which is now very tiny—as revealed by a photograph taken in 2003 (Fig. 1)—has been much reduced in size by erosion in historic times. In 1616 the bishop at Hólar, Guðbrandur Þorláksson (1571–1621), the father of scientific geography in Iceland, dispatched a team of men on an expedition to the islet. This was a great achievement of the day and although the actual account of the expedition is lost, there exists a poem consisting of 75 verses, written in 1665, about it. The poem states that the dimensions of the island were, in present day terms, 690 m (2260 feet) long, 100 m (328 feet) wide, and 100 m (328 feet) high (Einarsson 1665). The height is probably an exaggeration but both width and length are thought to be reasonably accurate (Sæmundsson and Hjartarson 1994). A photograph taken in 1932 (Fig. 2) reveals the reduction in size suffered by Kolbeinsey during the approximately 300 years since the expedition (Eggertsson 1932), and a comparison with Fig. 1 shows the continuance of this process to the present day. An Icelandic survey of the island in 1985 showed it to be 40 m (131 feet) by 42 m (138 feet) at low tide, with the highest point some 5 m (16 feet) above sea level (Sæmundsson and Hjartarson 1994).

Hence, during the last 400 years the island has lost most of its volume due to erosion.

The island was first mentioned in the famous eleventh-century Icelandic saga *Landnámabók* (*Book of Settlement* in English): 'It is a day's sail north from Kolbeinsey to the uninhabited parts of Greenland' (Íslenzk fornrit 1933a). The island was named after Kolbeinn Sigmundarson, the original settler of Kolbeinsdalur in Skagafjörður, who is described in the fourteenth-century *Svarfdæla* saga (*Saga of the Men of Svarfaðardalur*) as having become so infuriated about political reversals in Iceland that he 'jumped aboard ship and sailed out to sea. His ship was wrecked on the rock that lies northwest of Grímsey. Kolbeinn perished there and the island was named after him and called Kolbeinsey' (Íslenzk fornrit 1933b).

Kolbeinsey is of volcanic origin and is located on the active Kolbeinsey Ridge, which is a part of the Mid-Atlantic Ridge system. The island was created quite recently, in glacial or early Holocene time (maximum 7000 years ago), and is an example of a 'table mountain.' These are formed in sub-glacial or sub-aquatic eruptions. Kolbeinsey consists of basaltic lava with very many cracks and vesicles. Forces from the sea and ice act on these weaknesses and lead to substantial erosion both in terms of slow removal of material and the loosening of large boulders. Submarine erosion is also taking place. The erosion zone of the island ends at a depth of almost 40 m (130 feet). At approximately 10 m (33 feet) depth, there is a markedly weak layer of basalt, and the orientation of this has concentrated erosion on the north and north-western side of the island (Sæmundsson and Hjartarson 1994).

The area of the North Atlantic north of Iceland is very important for the fishing industry of Greenland, Iceland, and Norway, and in particular for the capelin fishery. The fishing rights have been contended by Denmark, on behalf of Greenland, since 1975 when Iceland imposed a 200-nautical mile fishing limit (United Nations 1976). Greenland reciprocated with a fishing limit of the same size in 1976, and since the Denmark Strait between Iceland and Greenland is less than 400 nautical miles wide a consensus was reached to use the median line between the two nations. This line was measured by way of base points and baselines in various places on the respective coasts. However, in opposition to the Danish position, Iceland included Kolbeinsey and Grímsey as base points in their own right, and this had the effect of increasing the Icelandic claim by some 11,500 km<sup>2</sup> (4500 square miles) (Denmark 1998a). The Icelandic regulations of 1975 were also protested against by Norway, due to a similar problem with the delimitation with the Norwegian territory of Jan Mayen, but this dispute was settled in 1980 when the two countries established a joint fisheries commission to



Fig. 1. Kolbeinsey. Picture taken on 24 May 2003 at 1:30 am. Photo: T. Jacobsen.

coordinate fishing activities around that island (Denmark 1980).

These valuable assets are the probable reason for the construction in 1989 of a concrete helicopter platform on Kolbeinsey. This is now the highest point of elevation and a prominent part of the island (Fig. 1). This had the effect

of increasing the island's resistance to erosion, thereby helping to avoid its eventual disappearance (Jia 1997). Importantly, international law distinguishes between an 'island' and a 'low tide elevation' when it comes to allowing the use of a structure as a base point in establishing an exclusive economic zone (EEZ). The Convention on

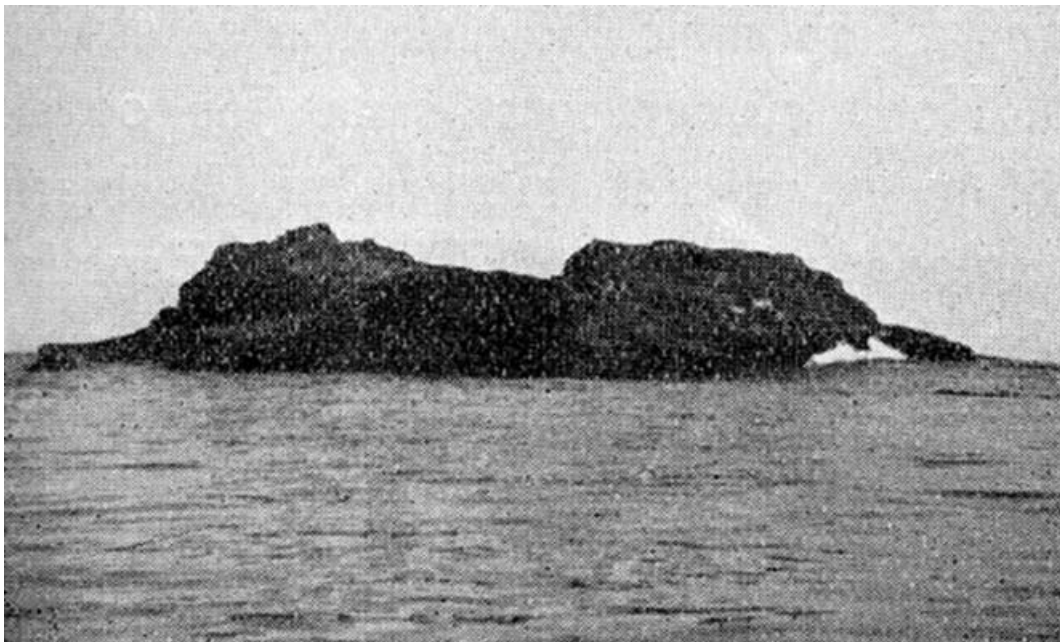


Fig. 2. Kolbeinsey photographed from the north in 1932.

the Law of the Sea states: 'Straight baselines shall not be drawn to and from low-tide elevations, unless lighthouses or similar installations which are permanently above sea level have been built on them or except in instances where the drawing of baselines to and from such elevations has received general international recognition' (United Nations 1982). It seems that Iceland may have constructed the helicopter platform in order to avoid discussions on the status of the slowly crumbling island by making sure that a permanent structure is in place when it inevitably, and by any standard, will become a 'low tide elevation' in the future. Iceland then has a stronger position if claiming Kolbeinsey as a base point in international negotiations.

Since 1980, various attempts have been made to settle the dispute, but with no immediate result. In 1996 matters came to a head, and there were clashes in the open sea between fishing vessels operating on Greenland fishing licences and the Icelandic coast guard. These incidents led to a settlement concerning the position of the median line at a conference on 11 November 1997 in Helsinki, where the Danish Foreign Minister signed an agreement with representatives of Iceland. This was ratified by the Danish Parliament in 1998 along with an amendment concerning the determination of the median line between Greenland and Jan Mayen (Denmark 1998a). The agreement gave Greenland the rights over some 70% of the contested area, whereas Iceland retained some 30% of the area, 'excluding the Grímsey area,' in a direct translation of the Danish text (Denmark 1998b). This formulation indicates that the existence of Kolbeinsey, and of the much larger Grímsey, are no longer of importance in the determination of fishing limits. But at the same time, the agreement stated that the determination of the fishing limits does not preclude fresh negotiations should there arise any other potential natural resources in the area that was formerly under dispute. It is still, therefore, in Iceland's interests to continue to prevent Kolbeinsey from sinking beneath the waves.

### Acknowledgements

The authors express their appreciation to the captain and crew of the vessel *Grigoriy Mikheev* for enabling them to visit Kolbeinsey in 2003, and to Dr R. Ringler of the University of Wisconsin for helpful advice.

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## Observations of juvenile ivory gulls (*Pagophila eburnea*) in Resolute Bay, Nunavut, Canada, August 2005

Jeff W. Higdon

Department of Geography, University of Manitoba, 501 University Crescent, Winnipeg, Manitoba, R3T 2N6, Canada

Stefan Romberg

Department of Fisheries and Oceans, Iqaluit, Nunavut, X0A 0H0, Canada

Received December 2005

doi:10.1017/S0032247406225294

**ABSTRACT.** Canadian ivory gull (*Pagophila eburnea*) populations have declined ca. 80% since the early 1980s, and observations, especially of juveniles, are noteworthy. From 20 to 26 August 2005 adult and juvenile ivory gulls were observed and photographed at Resolute Bay, Nunavut, Canada. The numbers of gulls observed reached a peak on 23 August when 18 birds (13 adults and 5 juveniles) were present. A minimum of 7 juveniles and 13 adults were present on 21 and 23 August, respectively, for a total minimum estimate of 20 ivory gulls. The highest numbers were observed during the stormiest days, suggesting that the gulls were taking shelter in the protected bay. Ivory gulls were observed in close proximity to other seabirds, and one fish capture attempt was observed. These are the first reported juveniles for Resolute Bay since 2000, and the first reported for the Canadian High Arctic since 2002, suggesting that breeding success in 2005 may have been better than in previous years.

### Introduction

The ivory gull (*Pagophila eburnea*), a globally rare species (ca. 14,000 breeding pairs), has always been uncommon in Arctic Canada where it is associated with sea ice throughout the year (Haney and Macdonald 1995). This little known species is considered to be of 'Special Concern' in Canada (COSEWIC 2005), and populations have declined considerably in recent years (Mallory and others 2003; Chardine and others 2004; Gilchrist and Mallory 2005). The Canadian breeding population was estimated at 2400 breeding birds in the early 1980s (Thomas and MacDonald 1987). Recent surveys have indicated a decline of approximately 80% since then (Gilchrist and Mallory 2005), and it is estimated that no more than 250–300 pairs now breed in Canada (Stenhouse and others 2004). For this reason, any observations of ivory gulls in Arctic Canada, and especially observations of juvenile birds, are noteworthy. In August 2005, ivory gulls, including juveniles, were observed and photographed (Fig. 1) on multiple days at the hamlet of Resolute Bay, Nunavut (74°43'N, 94°59'W).

### Observations

The observations, occurring from 20 to 26 August 2005, are summarized in Table 1. The observers, the authors of this note, were first in the area on 17 August 2005, late in the morning, and no ivory gulls were present at this time. The first sightings were opportunistically made on 20 August 2005, in the early evening. Three adults were observed on the east side of the bay, with eight more on a grounded iceberg on the western shore. It was difficult to identify the ages of the birds due to fog, but all appeared to be adults. The observers did not examine the area over the two previous days due to other research commitments, so there is no determination concerning when the ivory gulls first appeared.

The site was returned to repeatedly from 21–26 August whenever the weather and the scheduling of other work permitted. On each visit, a survey was made of that part of the entire harbour area that had road access, on both eastern and western sides. The community dump, which had been used extensively by ivory gulls in the past was also examined (Thomas and MacDonald 1987). On 21 August 2005, the harbour site was re-visited in the early evening and an adult and a juvenile bird were observed on the eastern side, and 12 birds (six adults and six juveniles) were perched on a grounded iceberg and along the shoreline on the western side.

Poor weather conditions prevented a return visit to the site until the morning of 23 August 2005 when 18 ivory gulls (13 adults and five juveniles) were observed on the east side of the harbour. No ivory gulls were observed along the western side, including the community dump. In the afternoon 10 ivory gulls (six adults, and four juveniles) were observed on the east side of the bay. Again no birds were observed on the western side.

The following morning (24 August 2005) only five birds (three adults and two juveniles) were observed, again all on the eastern side. A thorough search in the early evening failed to show any ivory gulls at all. One additional visit to the site was conducted in the afternoon of 26 August 2005, when one adult ivory gull was observed on the eastern side. It seems likely that the majority of the ivory gulls had departed from the area by this time, and that most had probably departed by 24 August 2005 (Table 1).

### Discussion

During migration, ivory gulls generally avoid ice-free water (Haney and Macdonald 1995). Of relevance to the observations set out in this note is the lack of sea ice in the area. The bay was essentially open water, save for several grounded icebergs (where birds were often perched). Our observations were approximately 25 km away from the nearest ice edge, and ice conditions at this time were approximately 40–60% below normal (Canadian Ice Service, Environment Canada 2005).

Chardine and others (2004) noted that birds observed at sea were never feeding on fish behind the boat or associating with other seabirds (also see Haney and MacDonald



Fig. 1. Photographs of ivory gulls (*Pagophila eburnea*) taken by the authors in Resolute Bay, Nunavut, August 2005. In all photographs, both adult and juvenile birds are shown. Juveniles are identified by black on face, wings and tail.

1995). However an adult bird was observed to catch (and then lose) a small (approximately 10 cm) fish (species unknown) close to shore on 23 August 2005. Ivory gulls were observed in close association with glaucous gulls (*Larus hyperboreus*), black-legged kittiwakes (*Rissa tridactyla*) and northern fulmars (*Fulmarus glacialis*).

Weather conditions had been quite variable over the course of the observations, and the highest numbers of birds were observed on stormy days. Wind speed increased from 20–23 August (Environment Canada Weather Office 2005), as did the number of birds

observed. On 23 August 2005 easterly winds were gusting to 59 km/hr, and this was when most birds were seen. On this day a large number (> 100) of black-legged kittiwakes were also observed. The wind speed decreased over the next several days (Environment Canada Weather Office 2005), and so did the number of birds, suggesting that the ivory gulls and kittiwakes observed may have been taking shelter from the storm in this protected bay.

The largest single observations of ivory gulls were 13 adults on 23 August 2005 and seven first year birds on 21 August 2005, giving a minimum of 20 ivory gulls. If

Table 1. Numbers of ivory gulls (*Pagophila eburnea*) observed at Resolute Bay, Nunavut (74° 43'N, 94° 59'W) between 20 and 26 August 2005. Observations were opportunistic and are separated into eastern and western sides of Resolute Bay. No birds were observed in the area on 17 August 2005, during the first visit to the site, and other commitments and inclement weather prevented searches on 18, 19, 22 and 25 August.

Date	Eastern side		Western side	
	Adults	Juveniles	Adults	Juveniles
17 August 2005 (morning)	0	0	NO DATA	
20 August 2005 (early evening)	3	0	8 <sup>1</sup>	0
21 August 2005 (early evening)	1	1	6	6
23 August 2005 (morning)	13	5	0	0
23 August 2005 (afternoon)	6	4	0	0
24 August 2005 (morning)	3	2	0	0
24 August 2005 (early evening)	0	0	0	0
26 August 2005 (afternoon)	1	0	0	0

<sup>1</sup>Dense fog made it difficult to ascertain age, however all birds appeared to be adults.

500–600 adult birds currently breed in Canada (Stenhouse and others 2004), the 13 adults observed here represent approximately 2.5% of the total breeding population. These sightings represent the first reported for young ivory gulls in Resolute Bay since 2000 (Mallory and others 2003; M. Mallory personal communication, August 2005), albeit without a consistent and intensive search effort. Birds were once fairly numerous in this area but have since become quite rare. Pre-breeding aggregations of birds were once common at the community dump (Thomas and MacDonald 1987), but residents of Resolute Bay have noted that birds are not seen there at present (Mallory and others 2003). Ivory gulls had been relatively common in Resolute Bay in late summer/early autumn in the more distant past (Duvall and Handley 1948).

The nearest colony to Resolute Bay, on Cornwallis Island (75°5'N, 94°15'W), is approximately 50 km from the community. This colony was discovered in 2003 and contained seven birds at that time (Gilchrist and Mallory 2005), but none have been observed there since (M.L. Mallory personal communication, August 2005). Colony usage by ivory gulls appears to be intermittent. The possible reasons for this include skipped breeding and/or movement between colonies (Gilchrist and Mallory 2005). The sightings reported here are the first observations of juveniles in the High Arctic since 2002 (M.L. Mallory personal communication, August 2005), and they may indicate that in 2005 ivory gulls had better breeding success than in recent years.

#### Acknowledgements

Logistical support during our stay in Resolute Bay was provided by Natural Resources Canada, Polar Continental Shelf Project. Helen Gordon gave us directions to the community dump site. Mark Mallory provided valuable discussion and a review of an early draft of this manuscript. Helpful comments were also provided

by Steven Gullage, Matt Betts, and two anonymous reviewers.

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