

The Ivory Gull: « the 21st century Dodo »

The Ivory Gull is the most emblematic bird of the Arctic, but also the least-known one.

Nowadays, it is certainly the most endangered species in the Arctic, together with the polar bear, facing a real risk of rapid extinction.

The Ivory Gull, or «21st century Dodo» as called by Ecopolaris, is one of the species best adapted to the most extreme ecosystems of the planet, but ironically on the verge of extinction due to global warming.

As it only breeds in the most extreme zones of the high Arctic (on some Nunataks and on

the most northernmost islands of Siberia and Greenland), it will not be able to find surrogate areas in case of severe habitat changes.

As the polar bear (on whom the Ivory Gull probably depends for feeding during a part of the year), it can only live in zones of permanent

pack ice, an environment which could completely disappear before 2050.

The world population, probably overestimated, does not exceed 10-25.000 individuals.

The fact that 80% of the Canadian population has already been lost within 20 years is highly concerning. Also at

Svalbard, the population seems to have dropped by two thirds within 10 years (1995-2006).

The study of the movements and dynamics of their populations, not only at their breeding colonies, but also in the pelagic zones of the arctic polar seas, represents a crucial issue.

What we still don't know...

- What is the current status of the species in Greenland and Siberia where the largest colonies are located?
- What is its exact distribution in Greenland?
- What is the recruitment rate (replacement of the adults through juveniles) in these colonies?
- Is the decrease observed in Canada a general phenomenon?
- How fast is this decline occurring?

- Where do they forage during the reproduction period?
- Can they change their breeding sites from one year to another?
- When do they leave their reproduction areas and what do they do in fall?
- Where are their wintering grounds?
- What are their migration routes?
- How exactly does the species depend on the frozen sea?
- ... and consequently what will be the impact of climate change on its future?

The ECOPOLARIS missions to Greenland are looking for answers to these mysteries

Goals

EXPLORE: complete the maps and censuses of the Greenland colonies by visiting the most remote and inhospitable zones of the island: the Nunataks of the East coast and the region of Prince Christian Land in the extreme NE Greenland.

MONITOR: proceed with new censuses of known colonies in Greenland to assess the overall population trends and to compare it with populations of other regions (especially Canada).

UNDERSTAND: describe the species' spatio-temporal use of the pack ice habitat by comparing the birds' localisations (through Argos locations) with satellite maps of the sea ice.

MODELLING: the species' demography, estimated through the re-sighting of young birds banded in 2003, will allow us to start modelling the long-term dynamics and thereof estimating the extinction risk of the species in Greenland.



DOCUMENT: the birds' fidelity to their colonies, the exchange rate between colonies, their migration routes, foraging areas in winter, wintering grounds, etc.

Methods

A programme of SATELLITE TRACKING has been initiated this year by fitting 13 Ivory Gulls with smalls Argos transmitters.

Two types of tags were used: eight tags of 12g operating

current record is 7 years on a stork), but they only work when the sun shines (so they do not work in high latitudes during the polar night).

Five tags of 20g operating on batteries. These heavier tags were put on the heaviest birds captured (the weight of the tag should not exceed 3% of the birds body weight). At best, they will emit for 5h a week until October 2008, but have the advantage of functioning independently of the weather and light conditions.

At the colonies, we also continued our BANDING programme started in 2003. The captured birds were equipped with an aluminium ring consecutively numbered and with a colour coded plastic ring. The first one can only be checked after recapturing the birds, but with the advantage of lasting the entire gull's life. The second one, less resistant, can be lost after some years, but it might be read from a distance using simple binoculars.

Preliminary Results

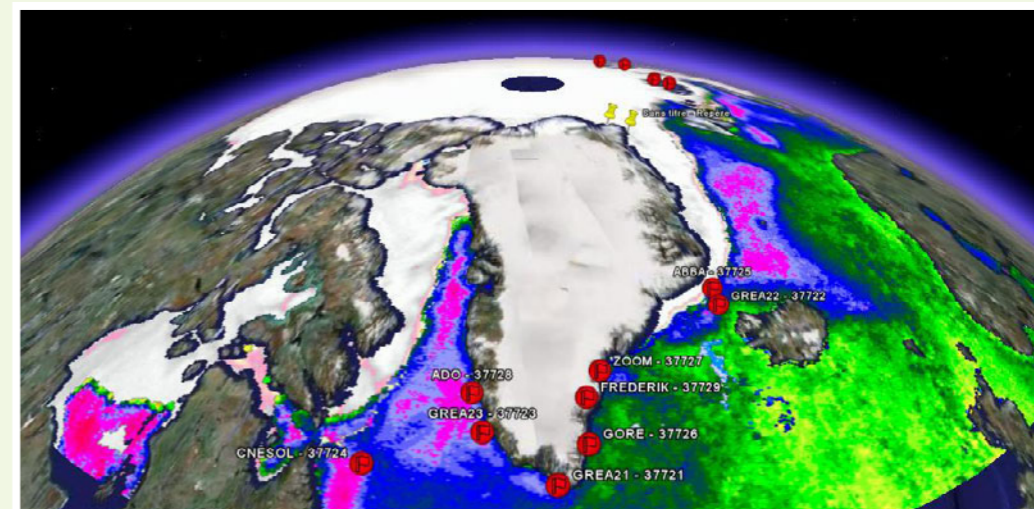
... and figures

In numbers...

The ECOPOLARIS 2007 mission yielded an impressive amount of scientific data. Below are a few results for the "Ivory Gull" part only (for the other research topics, see scientific report):

SATELLITE TRACKING of 13 adult birds captured in two colonies in North Greenland. After less than six months of monitoring, more than 16'000 localisations had already been obtained.

While breeding, the adults regularly leave for a few days and fly as far as 400 km from the colonies to forage. In August, some already started to disperse towards the North of Svalbard and further West along the Siberian coast, but never leaving the sea ice. Once the polar night arrives, they follow the ice-edge to its southern end, between SE Greenland and Iceland. At the beginning of December, some leave the ice for the first time (but only shortly), in order to reach the western coast of Greenland from south. On this migration route of more than 5000 km (after c.5 months), the birds mostly fly at an average speed of 20 km/h with peaks of 50 km/h or more.



LAST KNOWN POSITIONS OF THE 13 IVORY GULLS ON 14-12-07 (THE 2 CAPTURE SITES MARKED IN YELLOW)

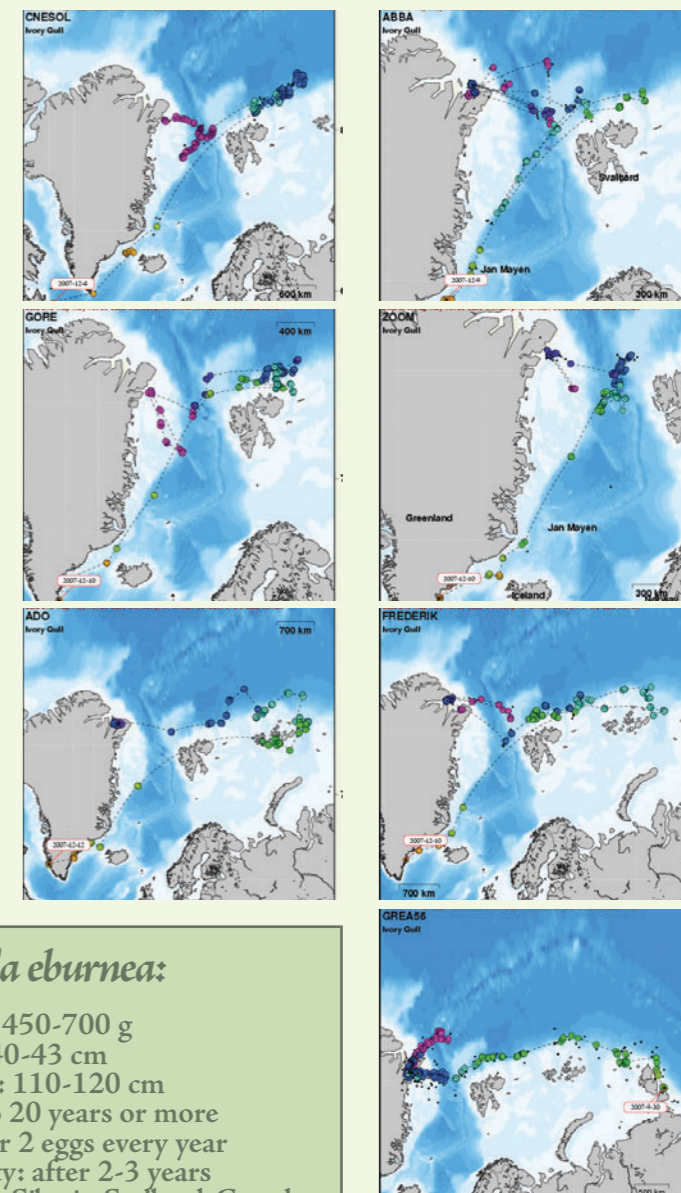
VISITING & COUNTING

50% of the known colonies of Greenland, including the four largest ones. The population seems stable or slightly decreasing in the North, but declining in the South. The entire Greenland population does probably not exceed 1000 - 1500 individuals!

DISCOVERY of two new colonies (only 15 colonies known in the 20th century).

BANDING, BIOMETRY and DEMOGRAPHY.

To date, nearly 300 Ivory Gulls have been ringed in Greenland by the missions ECOPOLARIS 2003 & 2007, which makes it the best "marked" population. The ratio of annual turnover of the adult population seems to be close to 3-4 %.



MOVEMENTS OF 7 IVORY GULLS MONITORED SINCE JULY 2007



Pagophila eburnea:

- Weight: 450-700 g
- Size: 40-43 cm
- Wing span: 110-120 cm
- Life span: up to 20 years or more
- Clutch size: 1 or 2 eggs every year
- Sexual maturity: after 2-3 years
- Distribution: Greenland, Siberia, Svalbard, Canada
- World population: 10-25.000 individuals
- Status: in danger of extinction due to melting of sea ice

The 2007 mission

16 June: Paris-Reykjavik-Akureyri (Iceland)

18-25 June : Camp 1 in Greenland (69°45' Lat. N)
Exploring by ski a zone of Nunataks (cliffs emerging from the icecap) at an elevation of 2-2500 m. A colony of Ivory Gulls was suspected there in 1984.

25-29 June: Camp 2 (68°55'N)

Exploring the Gunbjorn Fjell region (3700m: the highest summit of the Arctic) to collect mosses, lichens and vascular plants.

30 June -9 July: St. Nord-Bliss Bugt (>83°40'N, northernmost tip of Greenland). First Ivory Gulls banded and fitted with satellite tags at Station Nord. Five days of surveys at Bliss Bugt.

9-19 July: St. Nord-Henrik Kroyer H. (80°38'N)
Census, banding and satellite tagging of adult birds at the two largest colonies of Ivory Gulls in Greenland.



20 July - 21 August: Fjord Region (72-73° Lat. N)

Continuation of the other goals of ECOPOLARIS, especially the census of seabirds and the study of the lemming cycles.

Back to France on August 25.



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Prix Gore-Tex Initiative
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Scientific Partners:



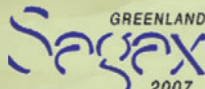
Universities Helsinki (FIN), Bremen (D), Bern (CH)

Norwegian Polar Institute (NO)

Arctic and Antarctic Research Institute (Russia)



Other partners:



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The results of the satellite monitoring can be seen at:

http://www.seaturtle.org/tracking/?project_id=233

http://www.jason.oceanobs.com/html/argonautica/donnees_2007-2008_fr.html



Groupe de Recherche en Ecologie Arctique

ECOPOLARIS
missions

In search of the Ivory Gull

Scientific Newsletter n°1 - dec. 2007

goals – methods – preliminary results

Olivier Gilg - Brigitte Sabard - Adrian Aebischer



ECOPOLARIS Mission 2007-08

Winner of the "Prix Gore-Tex Initiative"