

MEXICO 2014

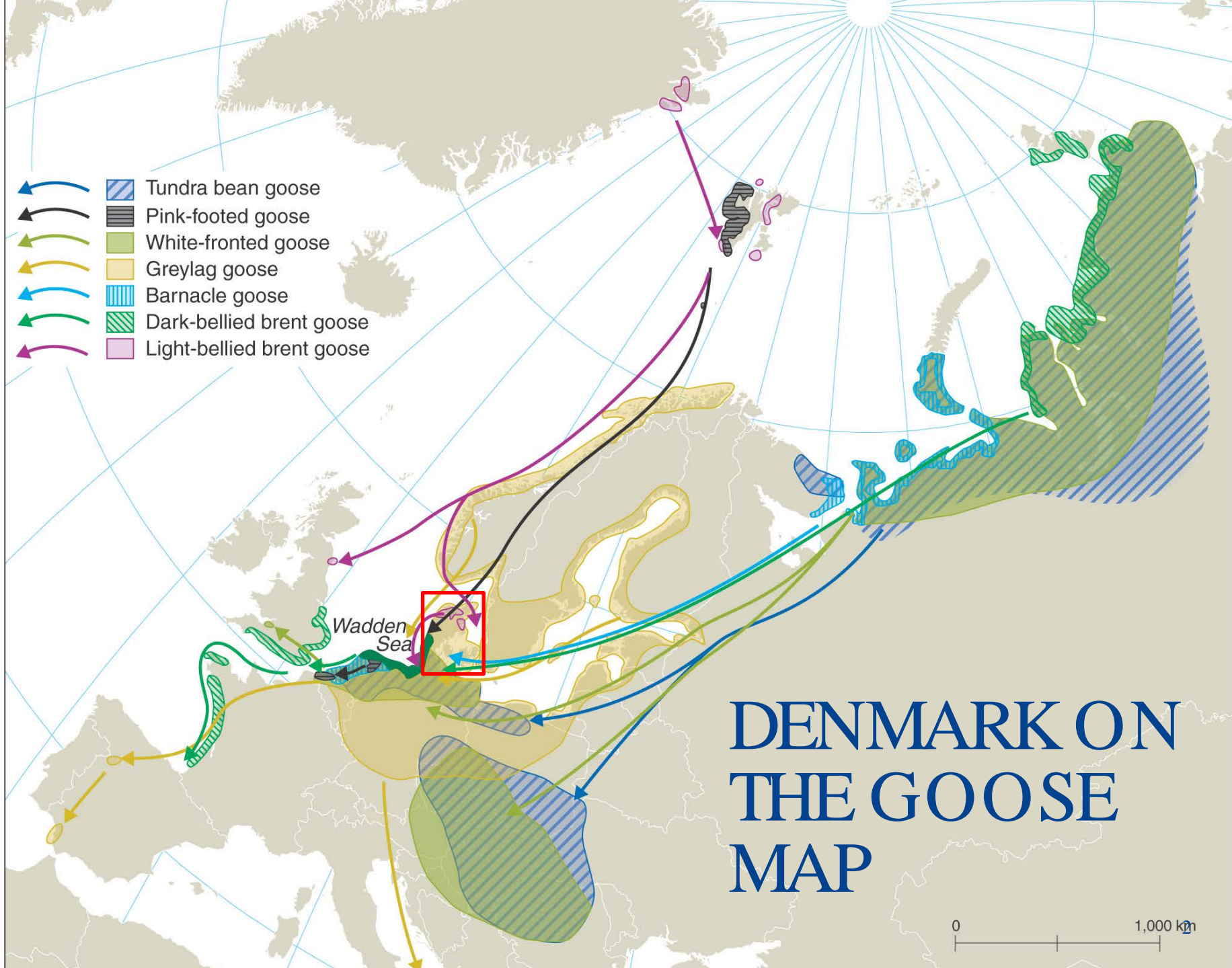
GEESE AND FLIGHT SAFETY IN DENMARK

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Photo: Torben Andersen





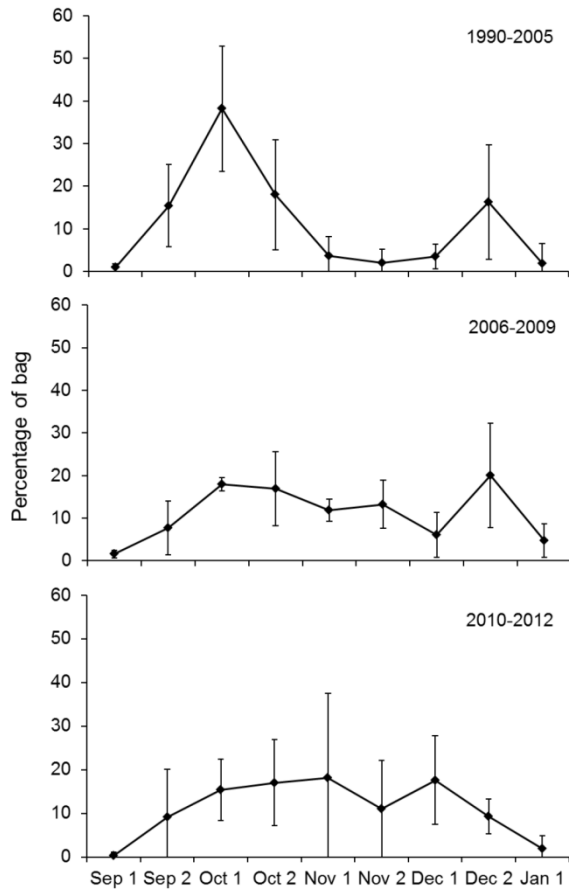
DENMARK ON THE GOOSE MAP

FLYWAY POPULATION SIZE

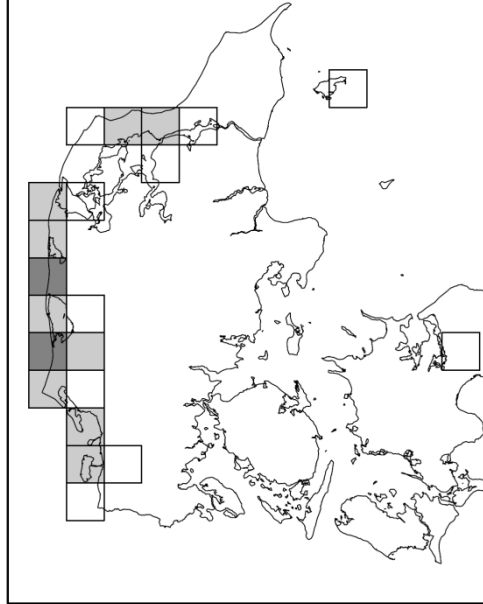
3.3 MILL

Species	<u>Flyway population</u>		<u>Denmark</u>	
	Population	Trend	Breeding	Wintering
Greylag Goose	610,000	+9.1%	c. 10,000	125,000
Bean Goose	585,000	+4.4%		12,000
Pink-footed Goose	80,000	+4.4%		46,000
White-fronted Goose	1,200,000	+2.9%		13,000
Canada Goose	90,000	+10.3%		22,000
Barnacle Goose	770,000	+7.8%	2-3,000?	109,000

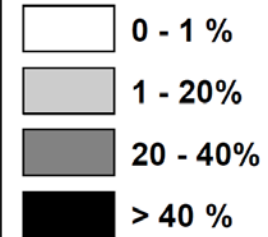
CHANGES IN PHENOLOGY



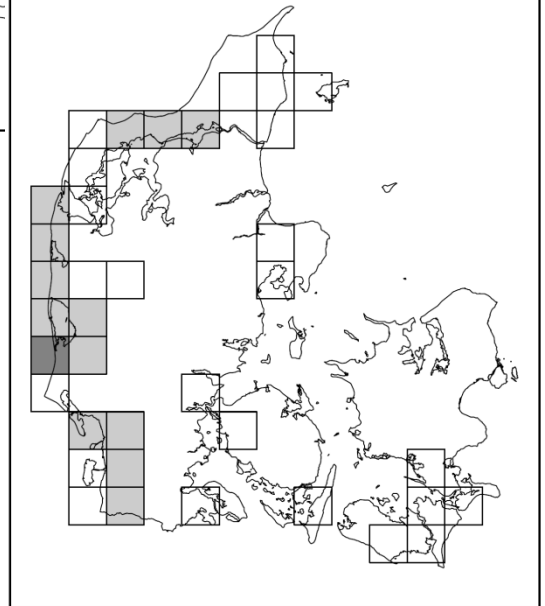
Hunting bag
1990-1999
n = 294



Percent of total



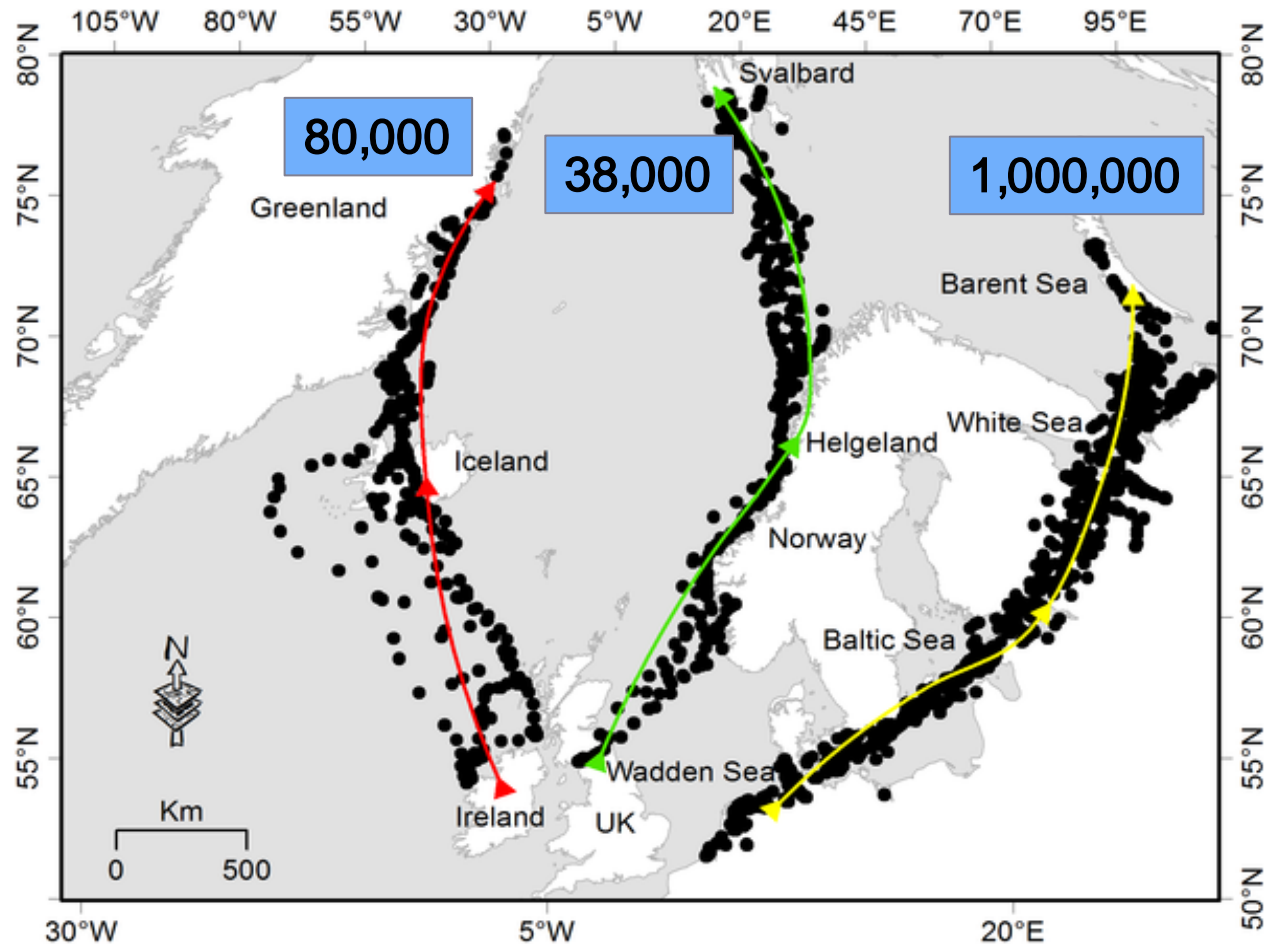
Hunting bag
2000-2012
n = 1312



Pink-footed Goose

BARNACLE GOOSE

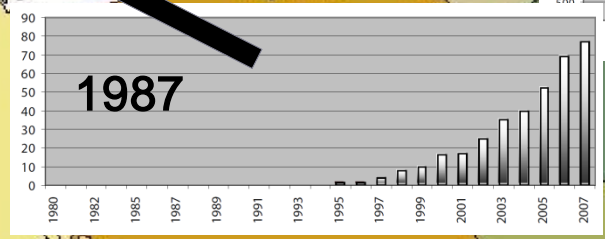
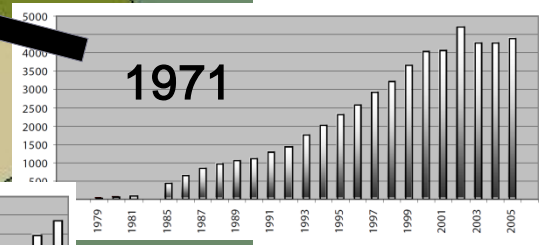
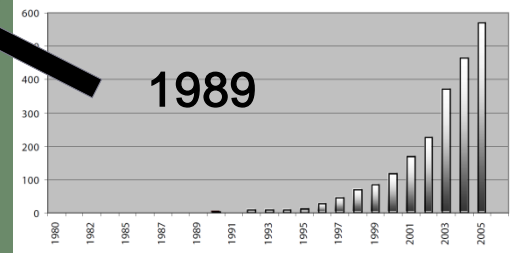
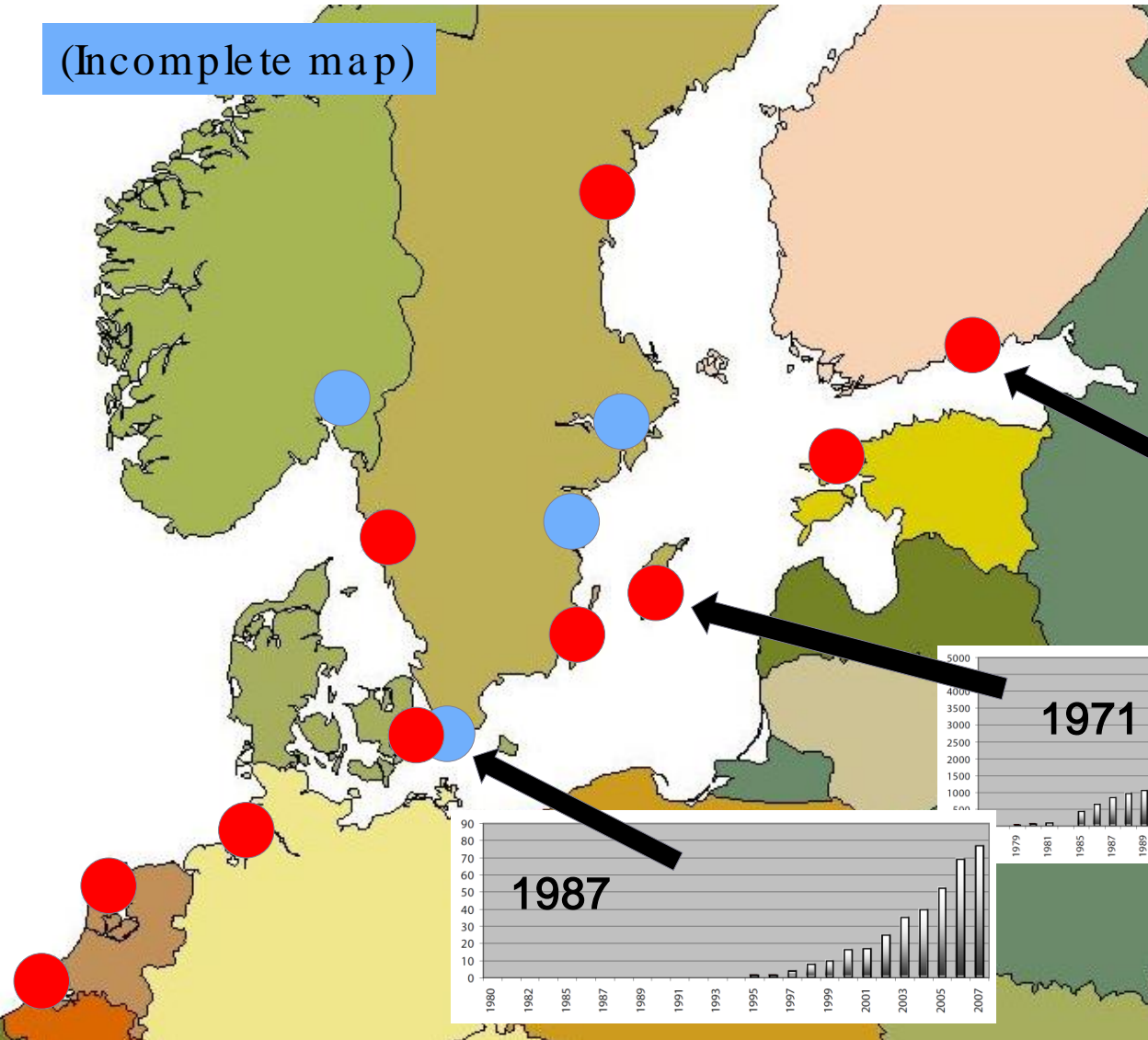
Figure 1. Spring migration route for three barnacle goose populations from their wintering to their breeding sites.



BREEDING BARNACLE GOOSE POPULATIONS

(Incomplete map)

- spontaneous occurrence or unknown origin
- known introduction of birds



THE BARNACLE GOOSE IN DENMARK

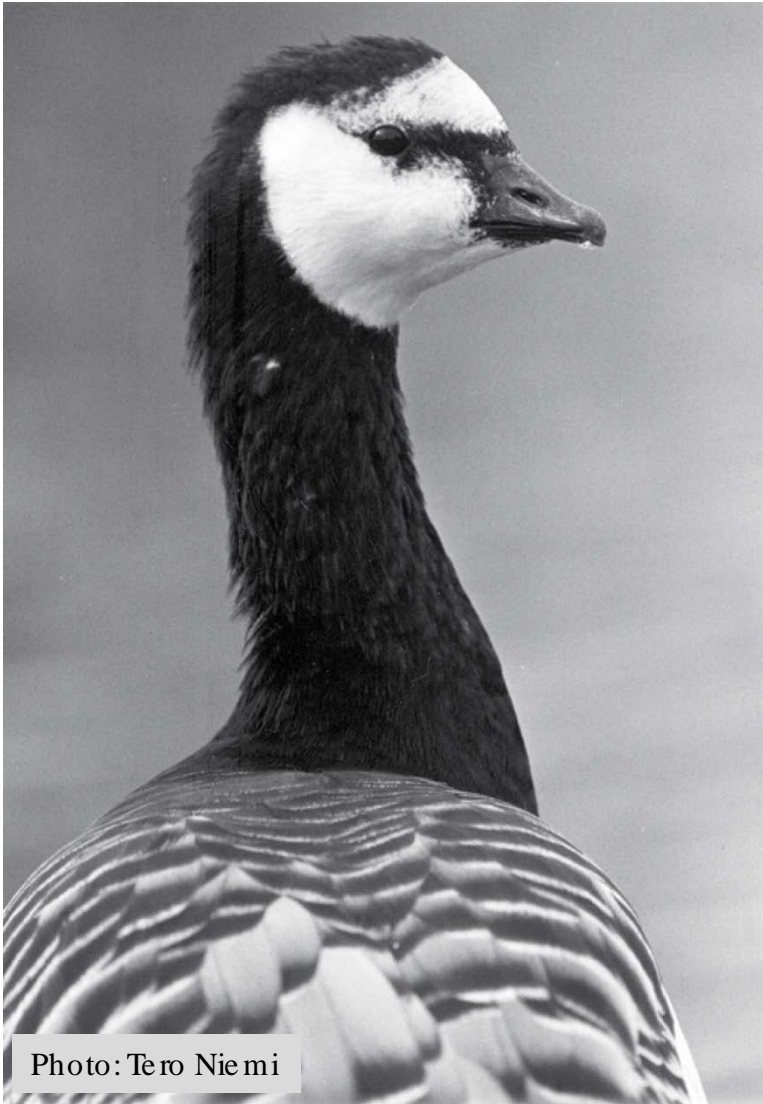


Photo: Tero Niemi

Breeding population

- › Saltholm:
- › 1992: 1 pair
- › 2014: 2,000-3,000 pairs ?
- › Other sites in DK
- › Few sporadic attempts

Occur all year round

- › Moulting, migrating, staging and wintering

Not huntable in the EU

INCREASING PROBLEMS

Urban populations

- › Adapt to human activities

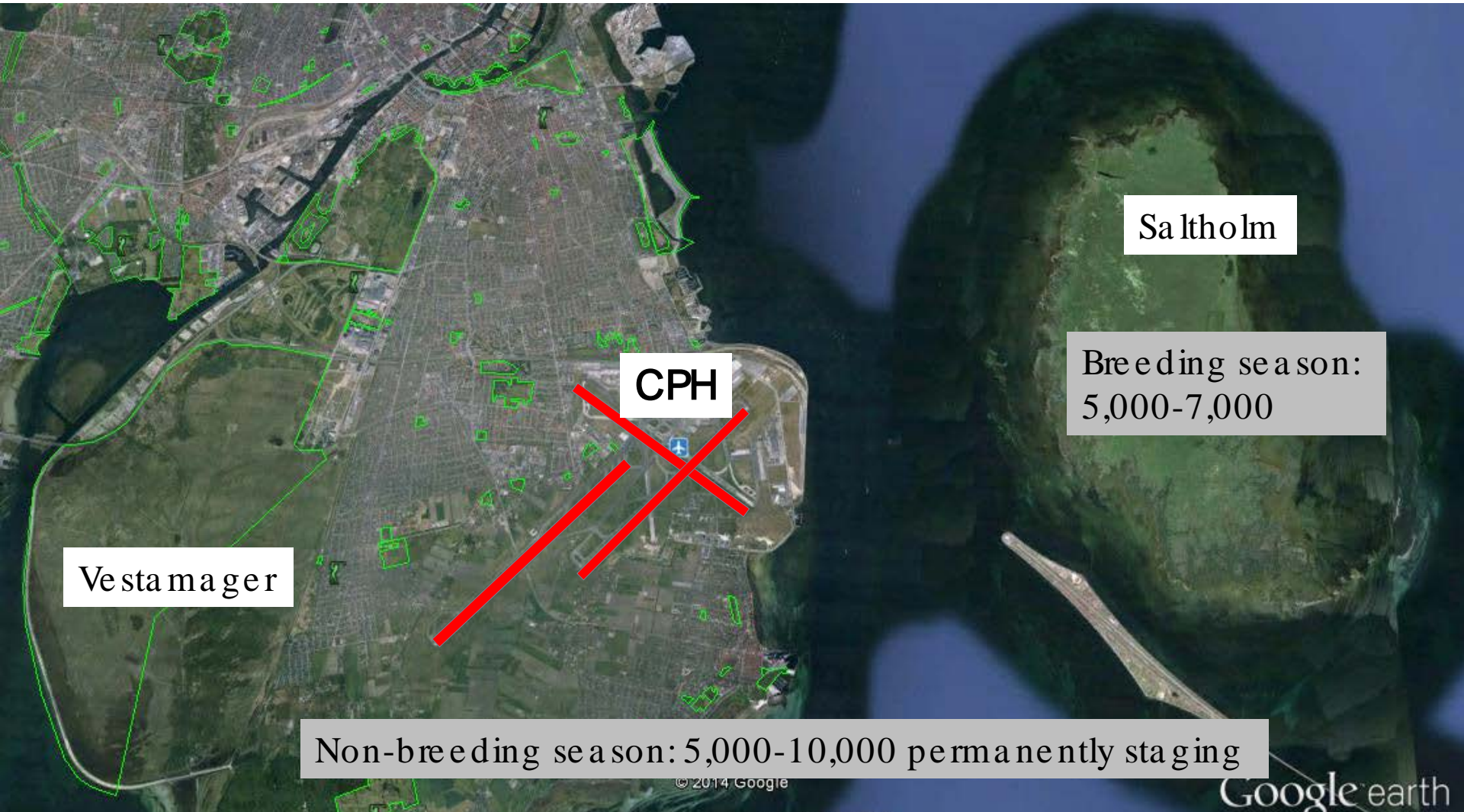
Wild populations

- › Bold or aggressive
- › Predator resistant

- › Damage to agriculture



BARNACLE GEESE AROUND CPH



Vestmager

CPH

Saltholm

Breeding season:
5,000-7,000

Non-breeding season: 5,000-10,000 permanently staging

GROWING CONCERN IN CPH

Locally breeding birds

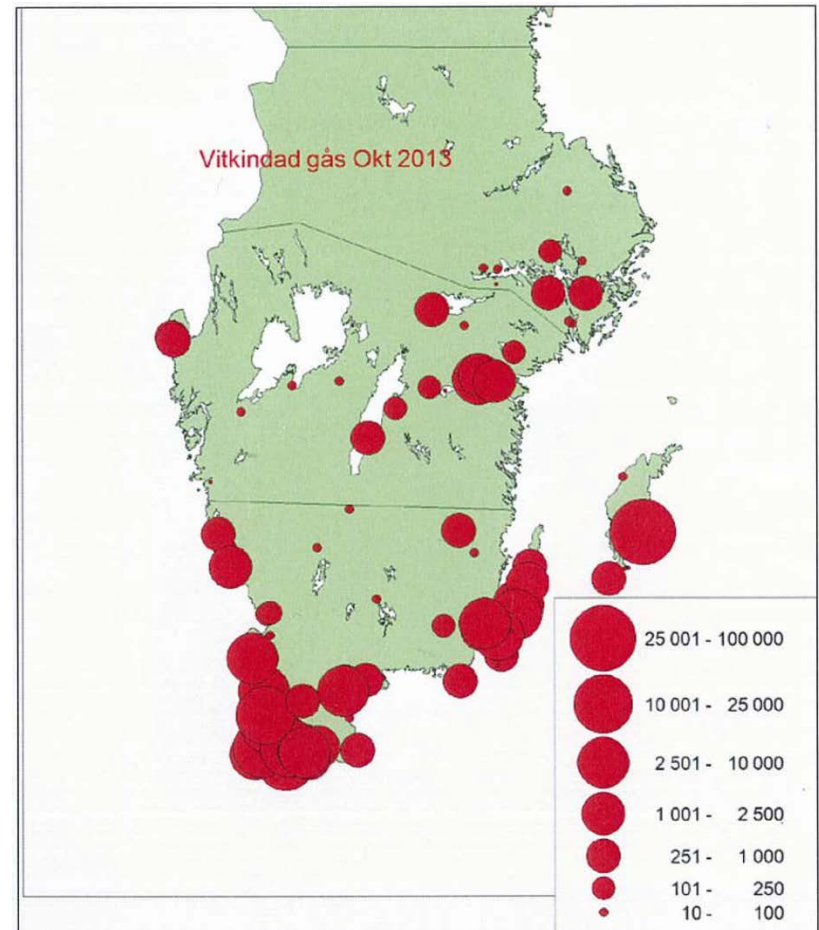
- › Postbreeding dispersal
- › Chance of urbanisation

Staging birds

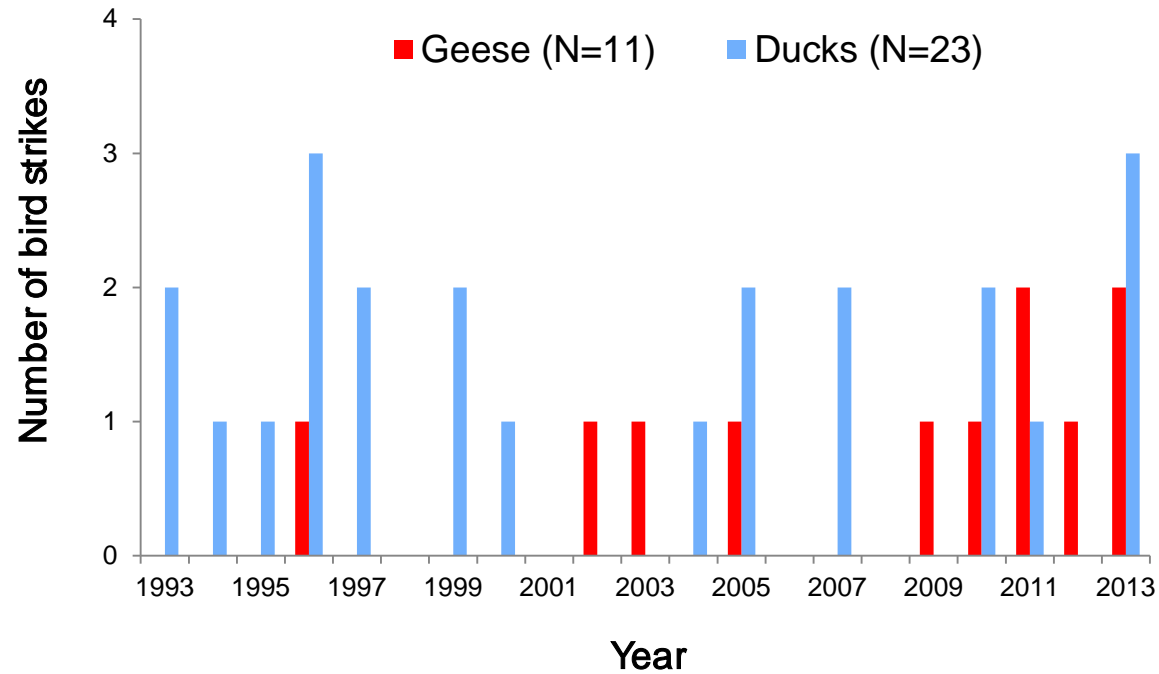
- › Local movements

Migrating birds

- › spring and autumn



BIRD STRIKES WITH GEESE



NEW INITIATIVES

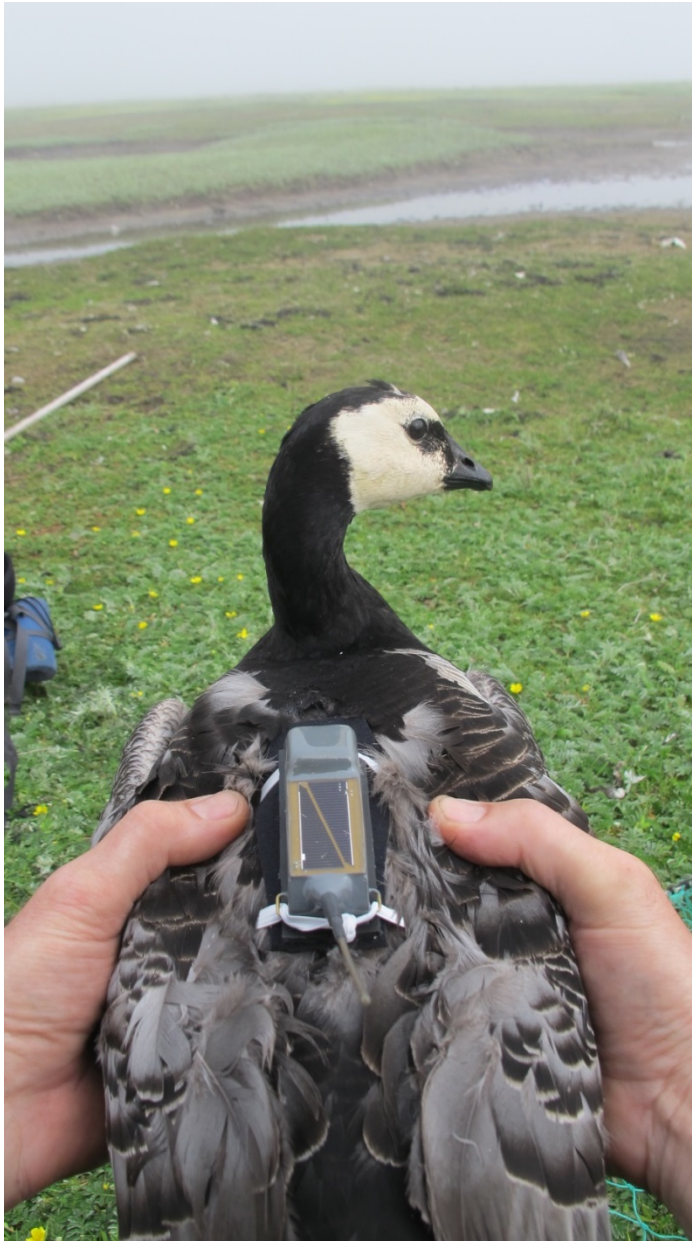
1. Monitoring movements of local breeding birds
10 birds marked with GPS-transmitters (CPH Goose tags)
2. Drafting a manual for wise management within airport safety zones (13 km) to avoid or reduce attraction of geese
3. Evaluate effects of continuously wetland restoration on the risk of bird strikes

GOOSE CAPTURE - MAY 2014



GOOSE CAPTURE - MAY 2014





GPS/ GSM transmitter

- › Position, altitude and speed (once/min.)
- › Powered by solar cell
- › Data download every day via GSM-network
- › Longevity ?

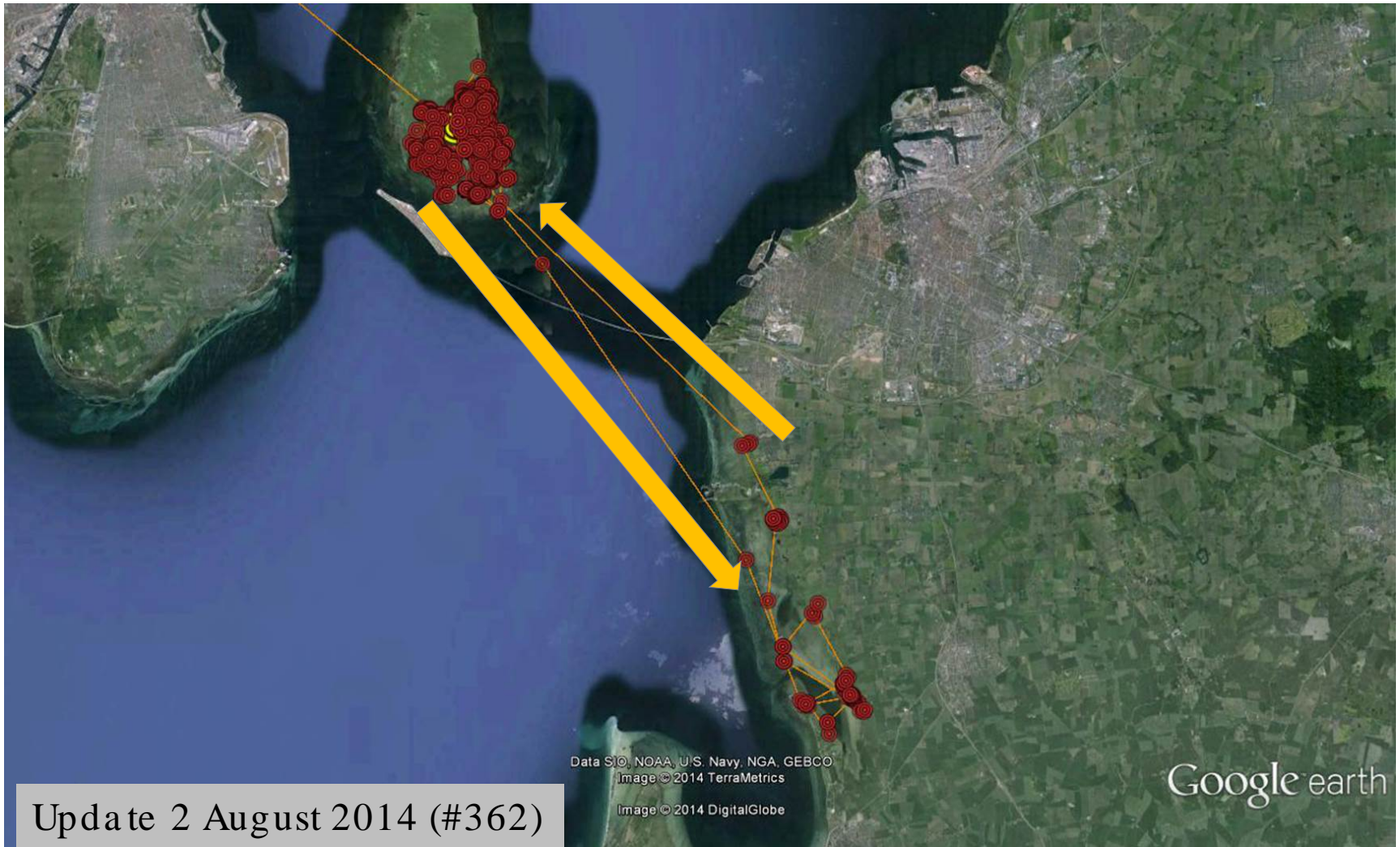
MISSION COMPLETED



LOCATION OF MARKED INDIVIDUALS

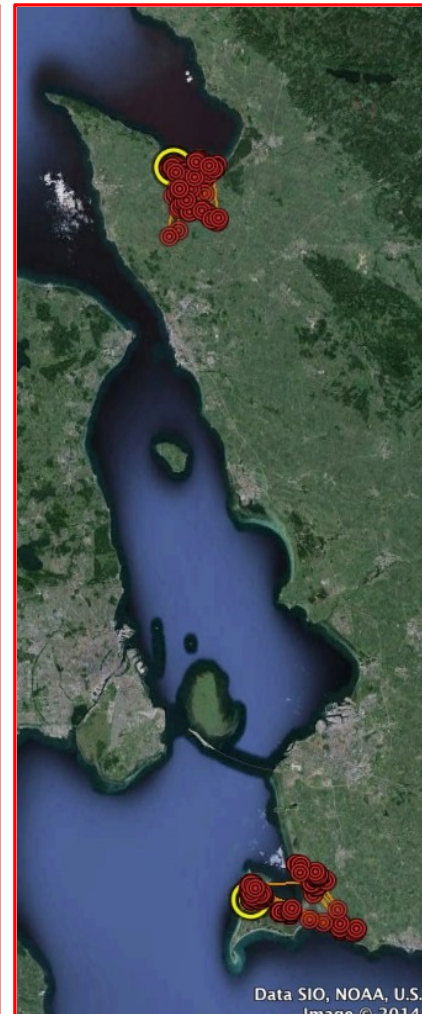
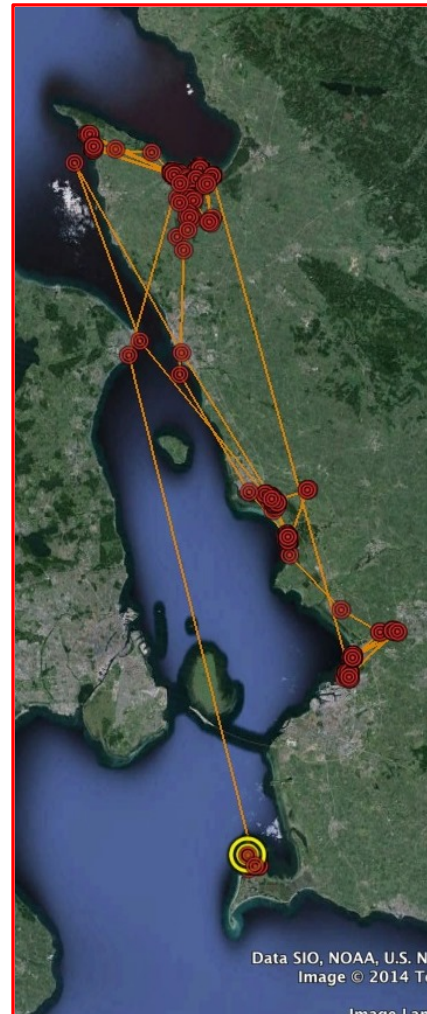
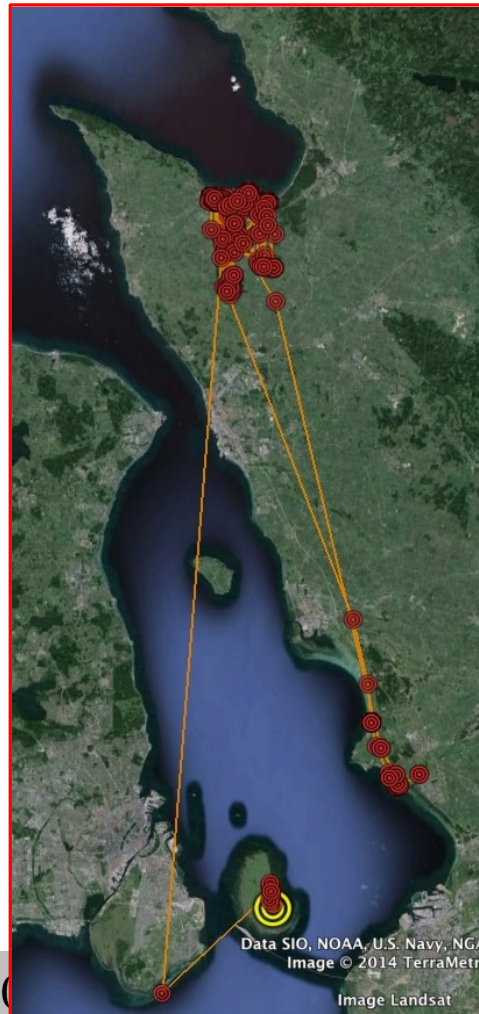
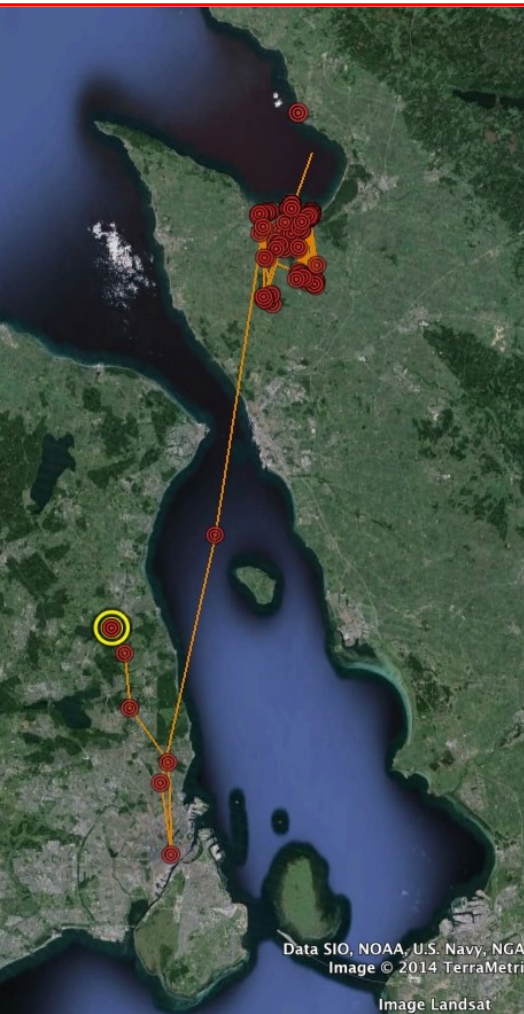


LOCAL MOVEMENTS

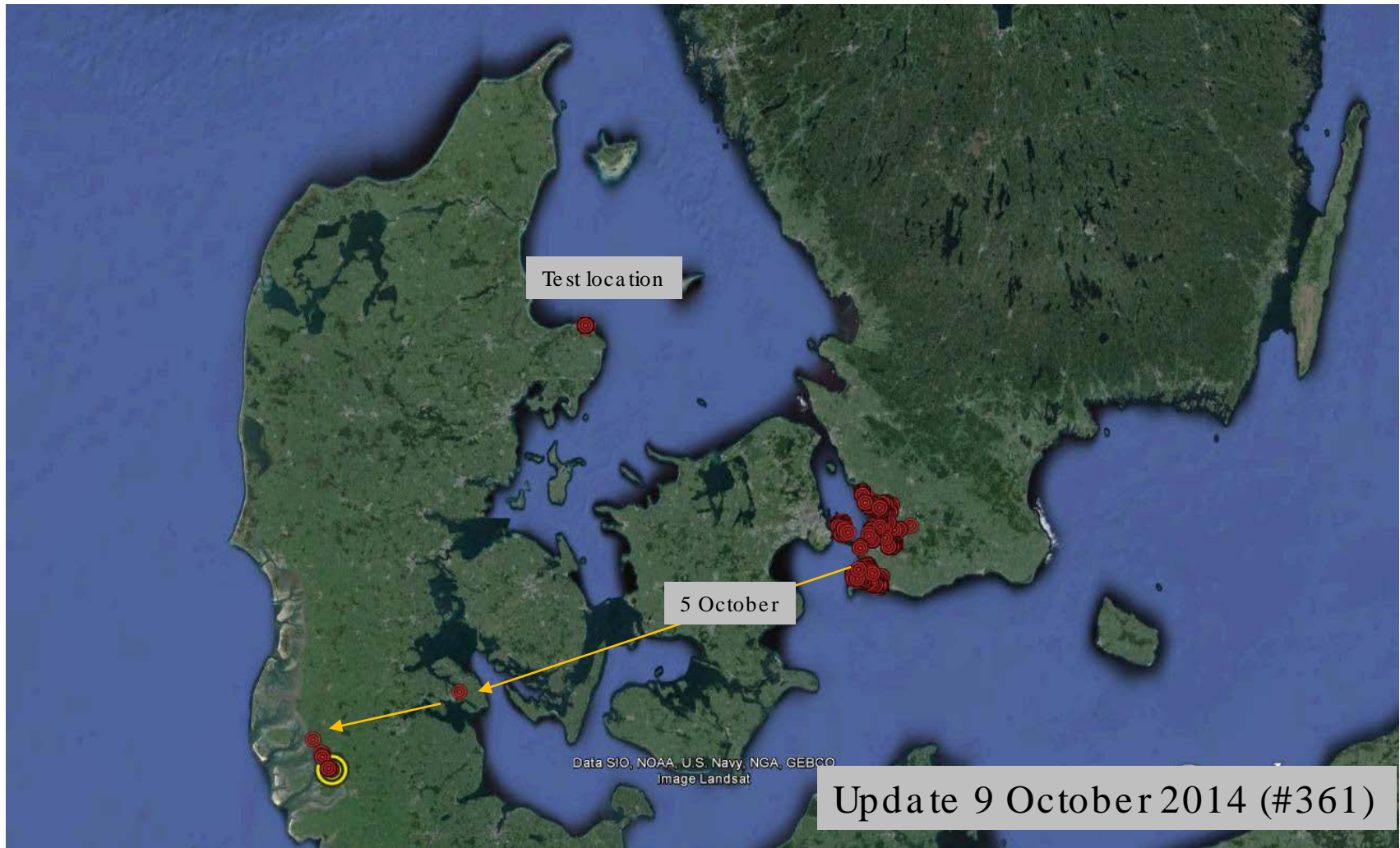


Update 2 August 2014 (#362)

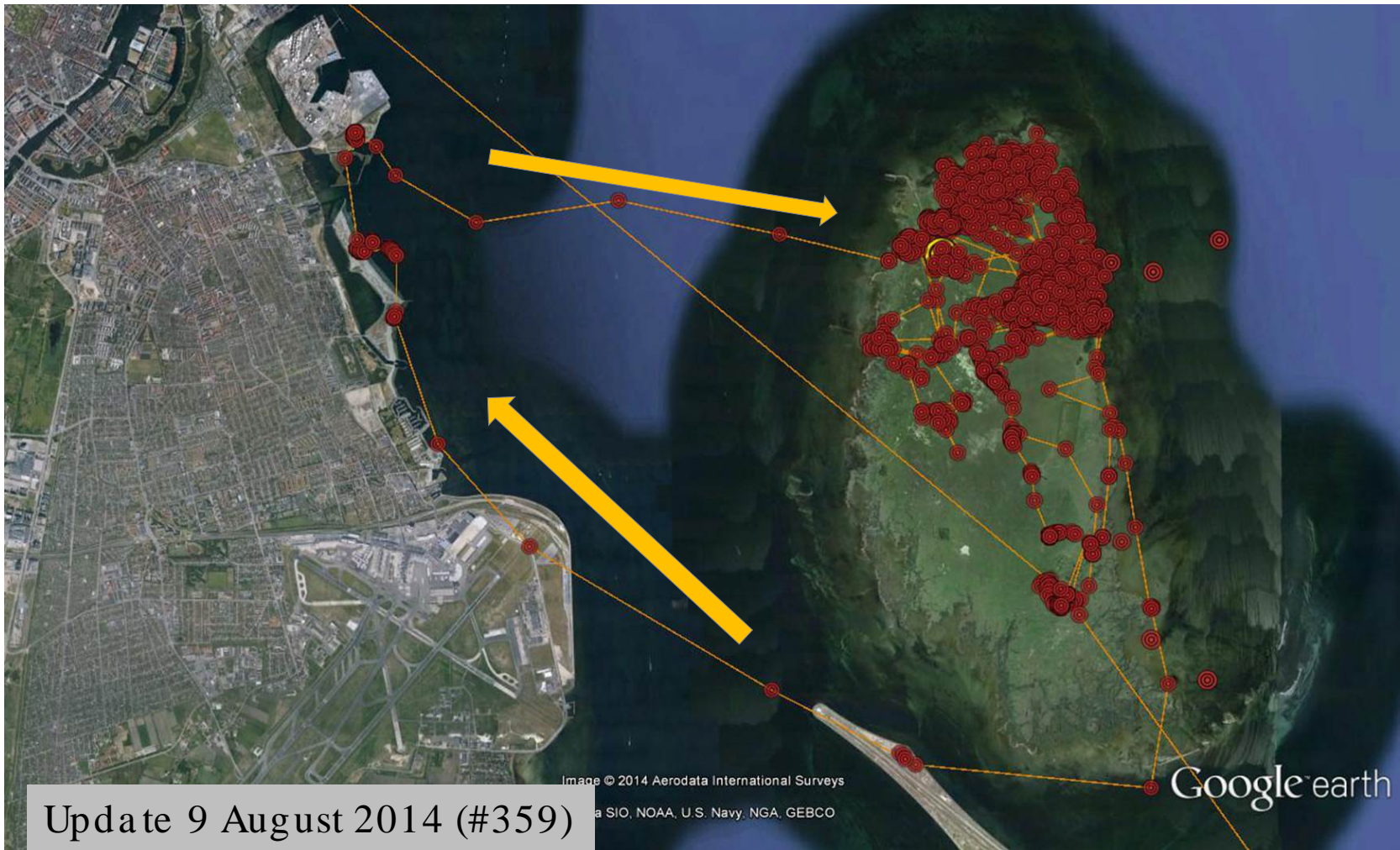
LOCAL MOVEMENTS - SEPTEMBER



MIGRATION



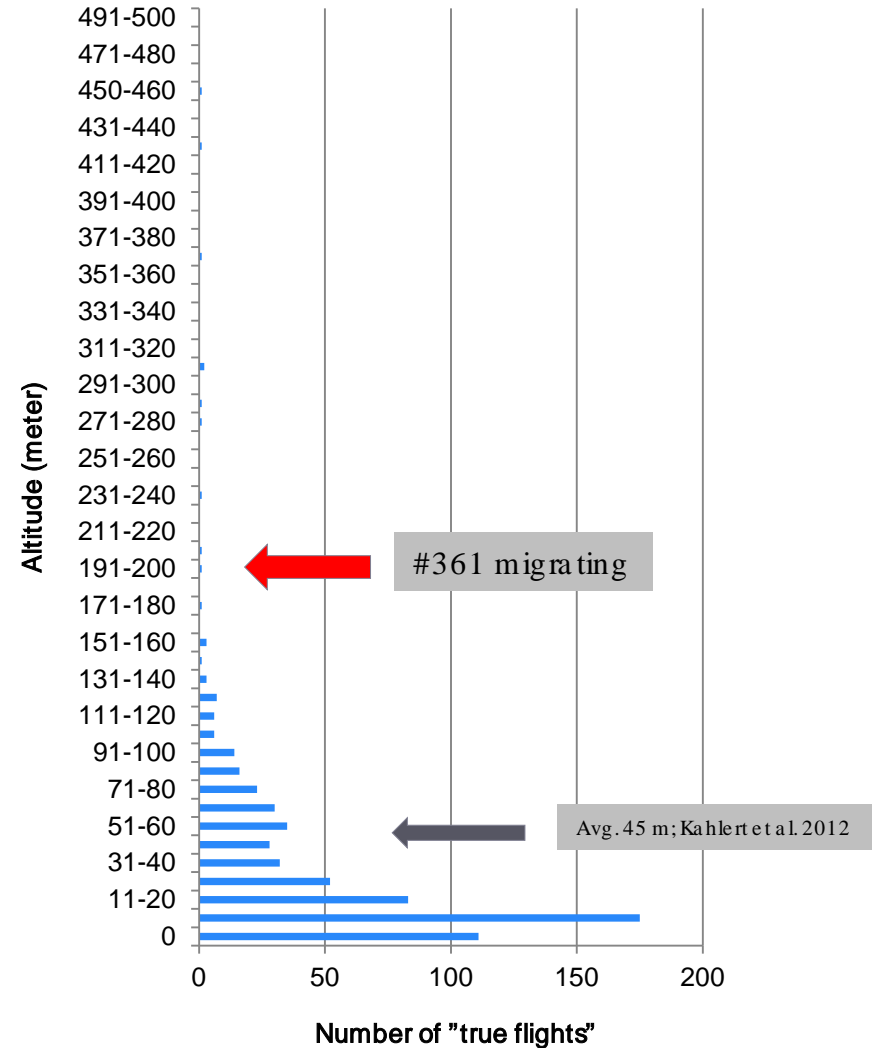
CRITICAL MOVEMENT



FLIGHT ALTITUDE

Pre lim in a ry re sults

N= 636 "true flights"



STATUS

- › Goose populations are exploding
- › Geese pose an increasing risk to flight safety at airports
- › Local breeding Barnacle Geese at Saltholm are a potential but not an immediate threat at CPH
- › Increasing numbers of migrating geese are of concern
- › Future shifts in food availability and behavioural changes/adaptations may change geese distributions

WHAT TO DO

- › Monitor goose populations
 - › Overall populations sizes and phenology
 - › Development of local breeding colonies
 - › Population migratory phenology
 - › Local and regional movements
- › Continuously assess airport bird strike statistics
 - › Number of strikes
 - › Numbers of scaring events
 - › Number of individuals regulated on airports
 - › Assess best and develop new methods to deter geese
- › Potentially reduce geese attraction to airport safety zones
 - › Which farmland crops and practices are least attractive for foraging geese
 - › Effects of SPAs on bird numbers and staging periods
 - › How to manage wetlands (numbers, physical characteristics and occurrence of recreative activities)

THANK YOU FOR LISTENING



CPH – Copenhagen Airports



The Forest and Nature Agency

The Danish Transport Authority



Miljøministeriet
Naturstyrelsen