(7) Identifying and dealing with potential goose hazards at CPH, Denmark

Mogens Hansen[2], Camilla Rosenquist[2] and Thomas Kjær Christensen[1]
[1]Institute of Bioscience/DCE, University of Aarhus, Grenåvej, Rønde, Denmark
[2]Safety Management/Bird Strike, Copenhagen Airports, Lufthavnsboulevarden, Kastrup, Denmark

Several goose populations of northern Europe have increased dramatically in numbers during the past decades. In combination with changes in winter distribution and breeding range expansion in some traditionally arctic breeding species, the growing number of geese poses an increasing potential risk to flight safety. In the period 1992 to 2014, a total of 17 strikes with geese have been recorded at Copenhagen Airport (CPH). Of identified species, Barnacle geese, Graylag geese and Brent geese have been recorded in 7, 4 and 1 bird strike incidence respectively. Although geese only occur rarely in the bird strike statistic, an increasing trend in strikes with geese is recognizable at CPH, changing from few in a decade to now occurring annually. CPH is the largest airport in Denmark serving more than 240,000 aircraft movements annually, and are located close to main migratory corridors between wintering sites in Northwest Europe and breeding areas in boreal and arctic parts of the West-palearctic region. Likewise within less than 10 km from CPH, two large Special Protection Areas for Birds (SPAs) designated under EU legislation for both staging, wintering and breeding waterbirds are now used by an increasing number of geese. In consequence, assessment of both present and future potential risks from the occurrence of geese to flight safety in CPH has high priority. Of all goose species occurring in Denmark, only Barnacle goose, Greylag goose, Brent goose and Canada goose are recorded regularly near the CPH airport. Of these, only the Barnacle Goose and the Greylag Goose are regarded as serious hazard species. Risk assessments based on general occurrence, bird strike statistics and airfield deterrent activities have identified twelve potential hazards posed by these two species, specified by populations, phenology and behavior in the area around CPH. In 2014, the hazards related to flight mobility and dispersal of local breeding Barnacle Geese have been investigated using GPS-transmitters deployed on nesting geese. Further, by use of radars CPH is planning to assess the risk related to the presence of more than 40,000 Greylag Geese molting flight feathers on the island of Saltholm located about 8km from the airport. The remaining ten identified hazards are pending further prioritization, but some recordings for their evaluation have already been obtained. The GPS study of Barnacle geese showed that post-breeding movements did not occur to areas close to CPH. Geese moved to foraging and staging areas in Sweden and stayed there until southbound autumn migration to the Dutch, German and Danish marshes along the North Sea coast. Records during the following spring likewise show that the Saltholm Barnacle geese settle in Sweden upon arrival from the wintering areas, with no affinity for areas close to CPH. This result indicate that the locally breeding barnacle geese at present is of minor risk to flight safety at CPH compared to risk related to the large and increasing population of arctic breeding barnacle geese that pass and stage in the Copenhagen region on both spring and autumn migration.

Hansen,M., C. Rosenquist and T.K. Christensen. 2015. Identifying and dealing with potential goose hazards at CPH, Denmark. Proceedings of the North American Birdstrike Conference 15. 29 pages.

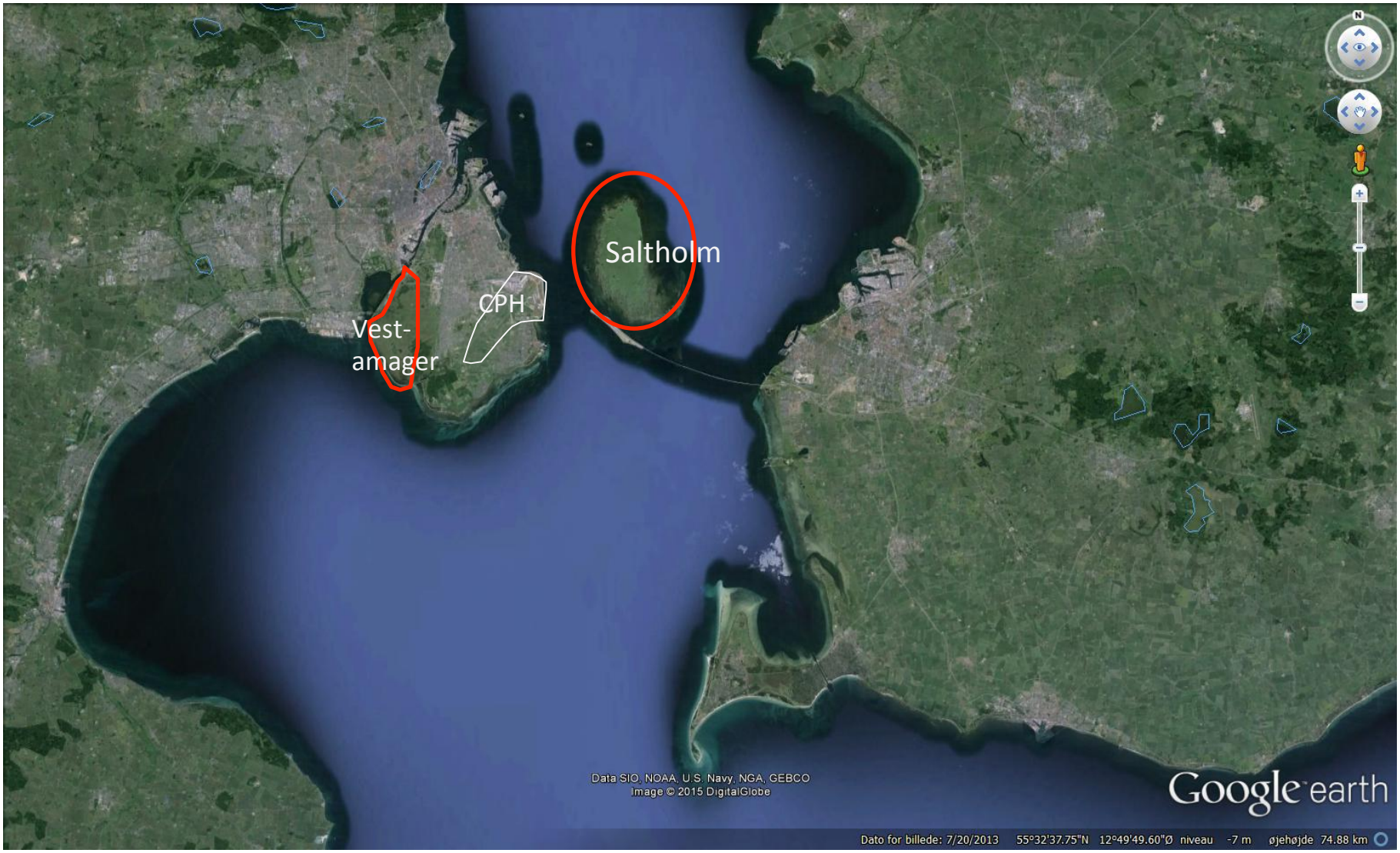
Identifying and dealing with goose hazards at Copenhagen Airports, Denmark

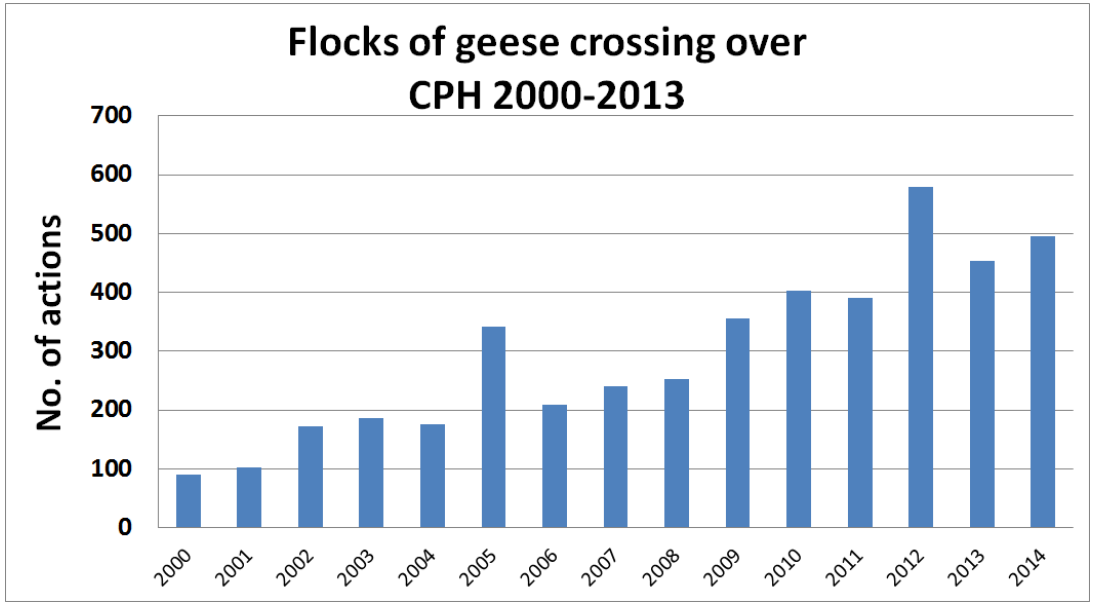
2015 North American Bird Strike Conference. Montreal,Canada.

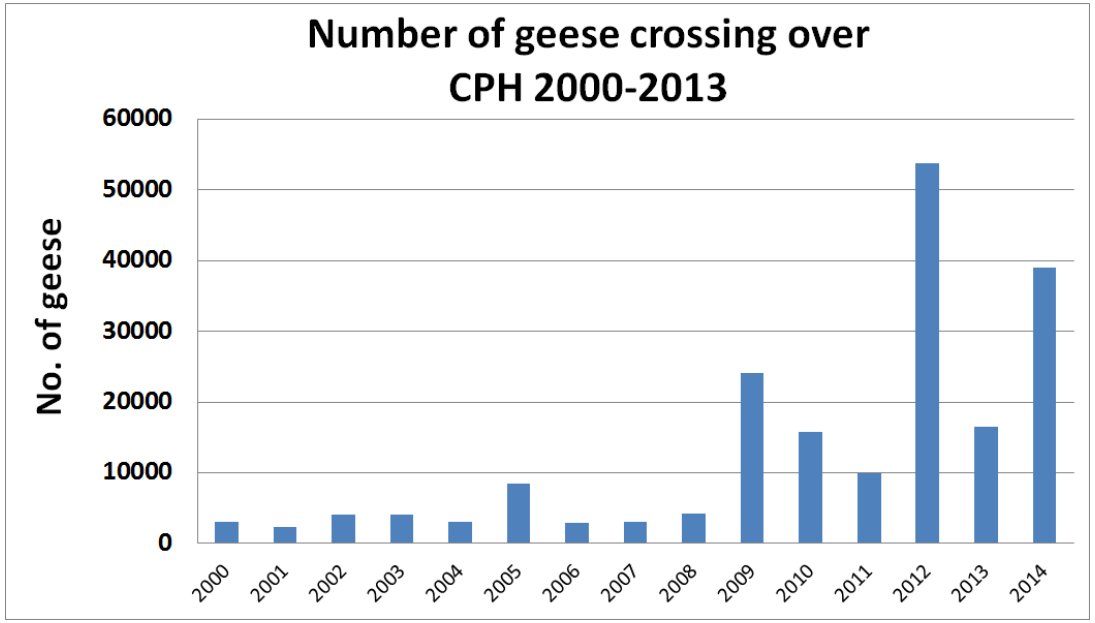
Mogens Hansen MSc & Camilla Rosenquist MSc, Copenhagen Airports
Thomas Kjær Christendsen PhD. University of Aarhus

AARHUS UNIVERSITY
DEPARTMENT OF BIOSCIENCE

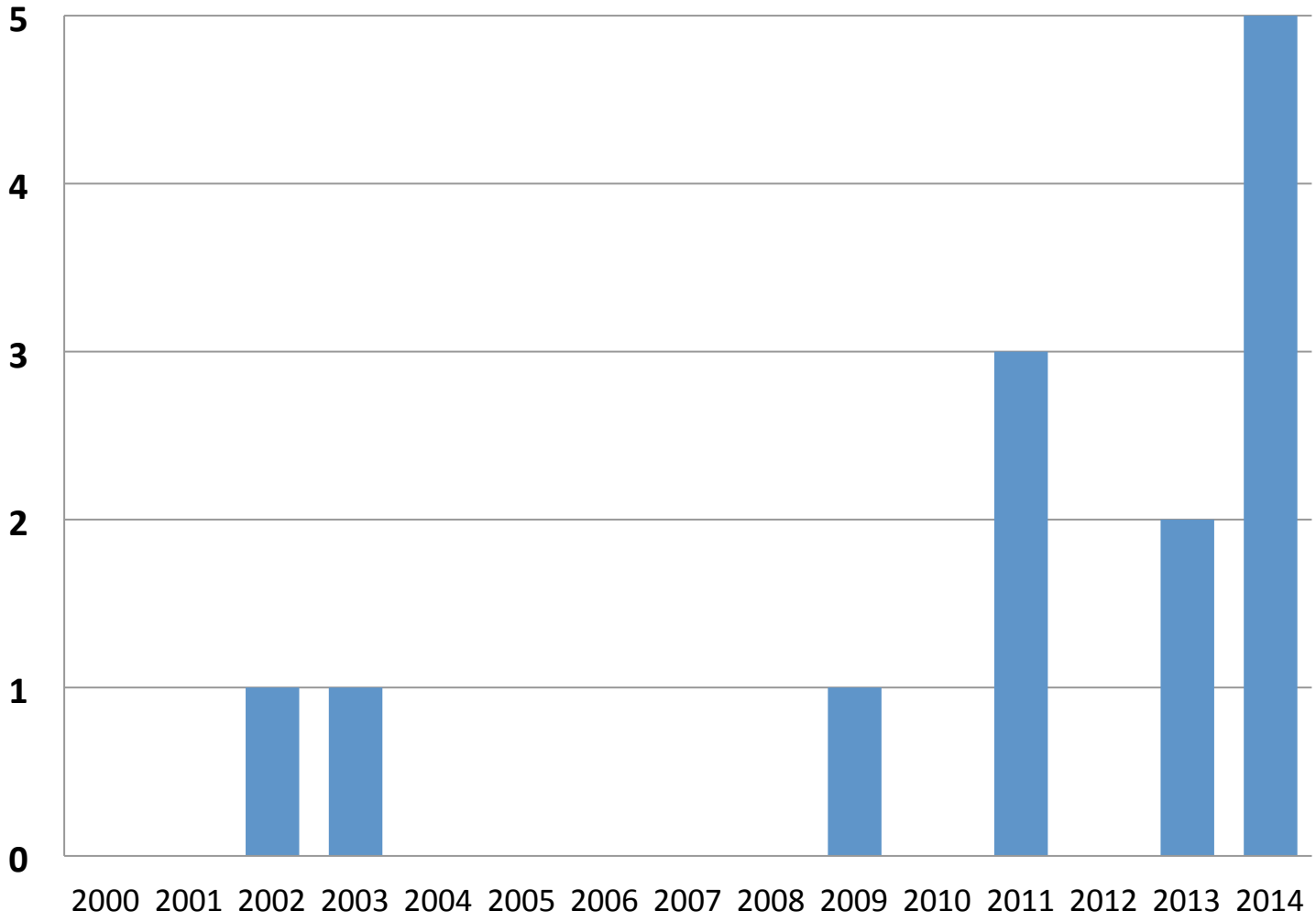
CPH

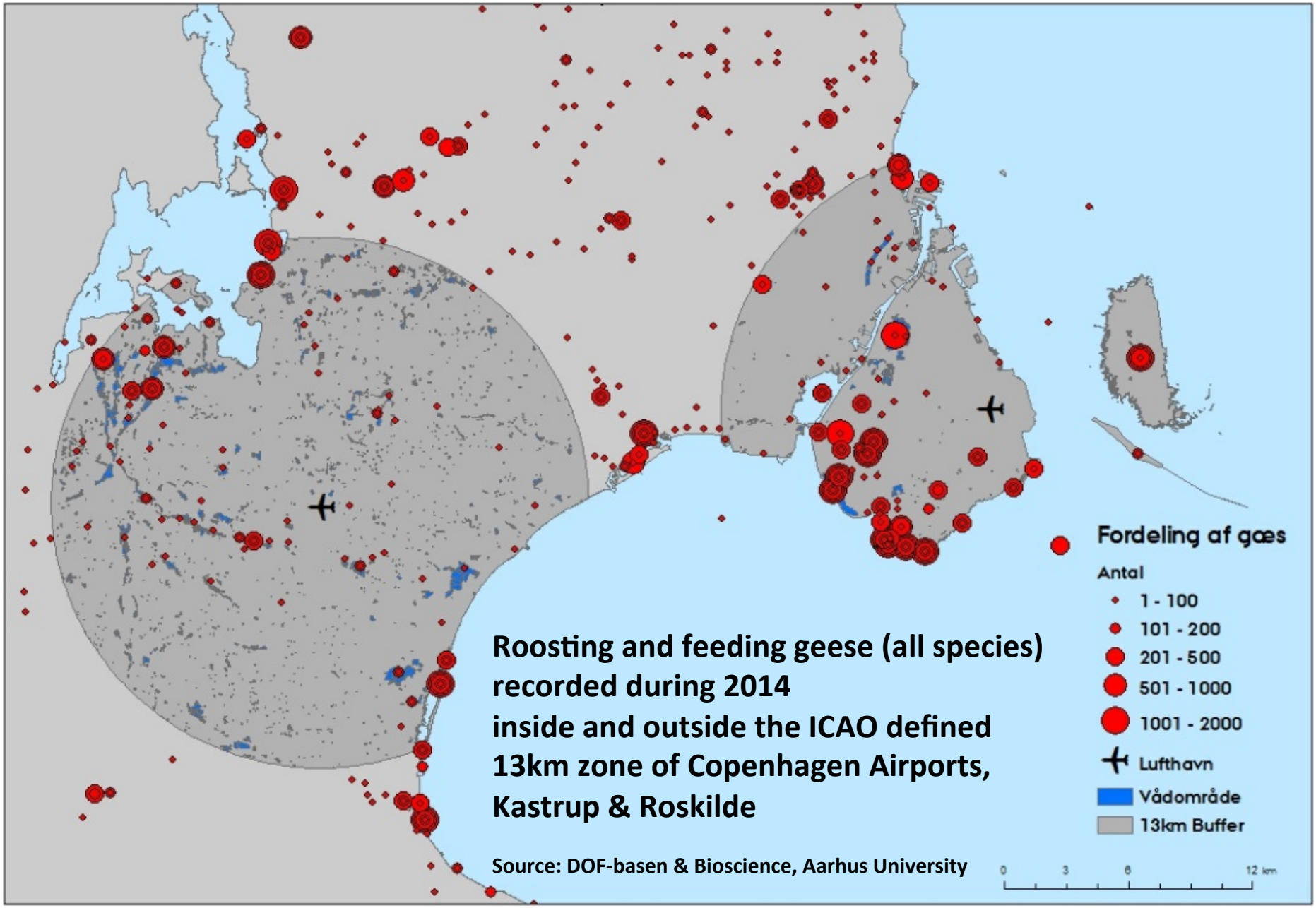

Saltholm
CPH
Vest-
amager
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2015 DigitalGlobe
Google earth
Dato for billede: 7/20/2013 55°32'37.75"N 12°49'49.60"Ø niveau -7 m øjehøjde 74.88 km


Flocks of geese crossing over
CPH 2000-2013
No. of actions
700
600
500
400
300
200
100
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014


Number of geese crossing over
CPH 2000-2013
No. of geese
60000
50000
40000
30000
20000
10000
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014

Goose strikes, CPH 2000-2014





Roosting and feeding geese (all species) recorded during 2014 inside and outside the ICAO defined 13km zone of Copenhagen Airports, Kastrup & Roskilde

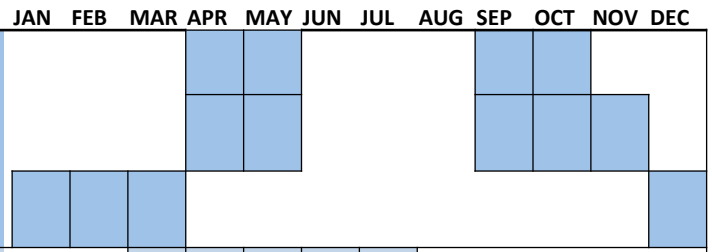
Source: DOF-basen & Bioscience, Aarhus University

AARHUS UNIVERSITY
DEPARTMENT OF BIOSCIENCE

CPH

The species involved

Hazards posed by geese within the 13km ICAO defined zone

Origin of hazards			Month of occurrence in CPH
Barnacle Goose	Russian/Baltic migrants	passage roosting (in the vicinity) wintering (in the vicinity)	
	Local breeders	rural (urban potential)	
Greylag Goose	Baltic migrants	passage roosting (in the vicinity) wintering (in the vicinity)	
	Local breeders	rural urban staging juveniles	
	40,000 moulting geese Saltholm	passage pre/postmoult roosting	

No. of hazards per month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Barnacle Goose	1	1	2	3	3	1	1		2	2	1	1
Greylag Goose	4	6	6	6	5	3	5	7	5	5	5	4

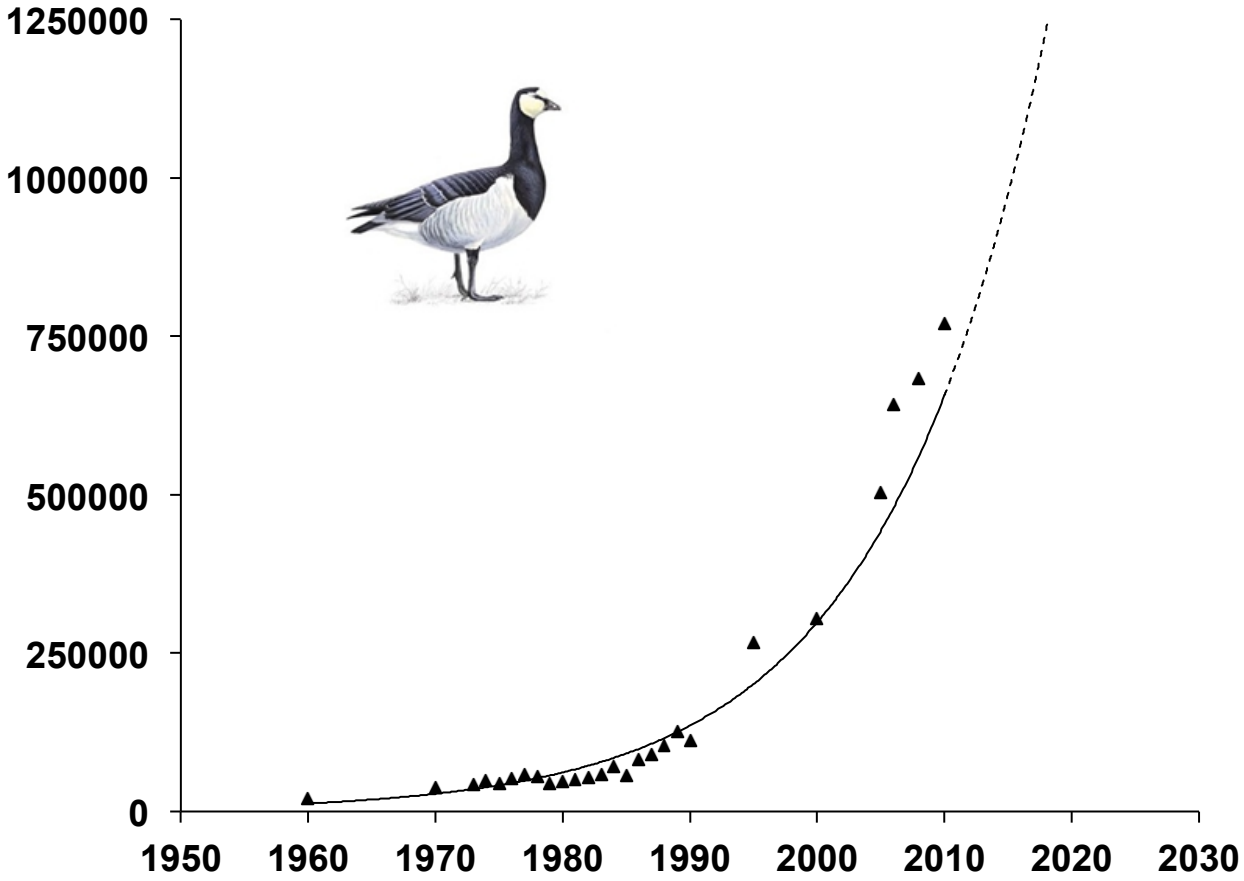
No. of strikes per month*	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Barnacle Goose			1		2			1		3		
Greylag Goose		2	1				1					

*) Data from 2000-2014

Barnacle Goose

Greylag Goose

West European population of Barnacle Goose



Source: Bioscience, Aarhus University

Populations of Barnacle Goose during breeding, migration and wintering

AARHUS UNIVERSITY
DEPARTMENT OF BIOSCIENCE

Source: Bioscience, Aarhus University

CPH

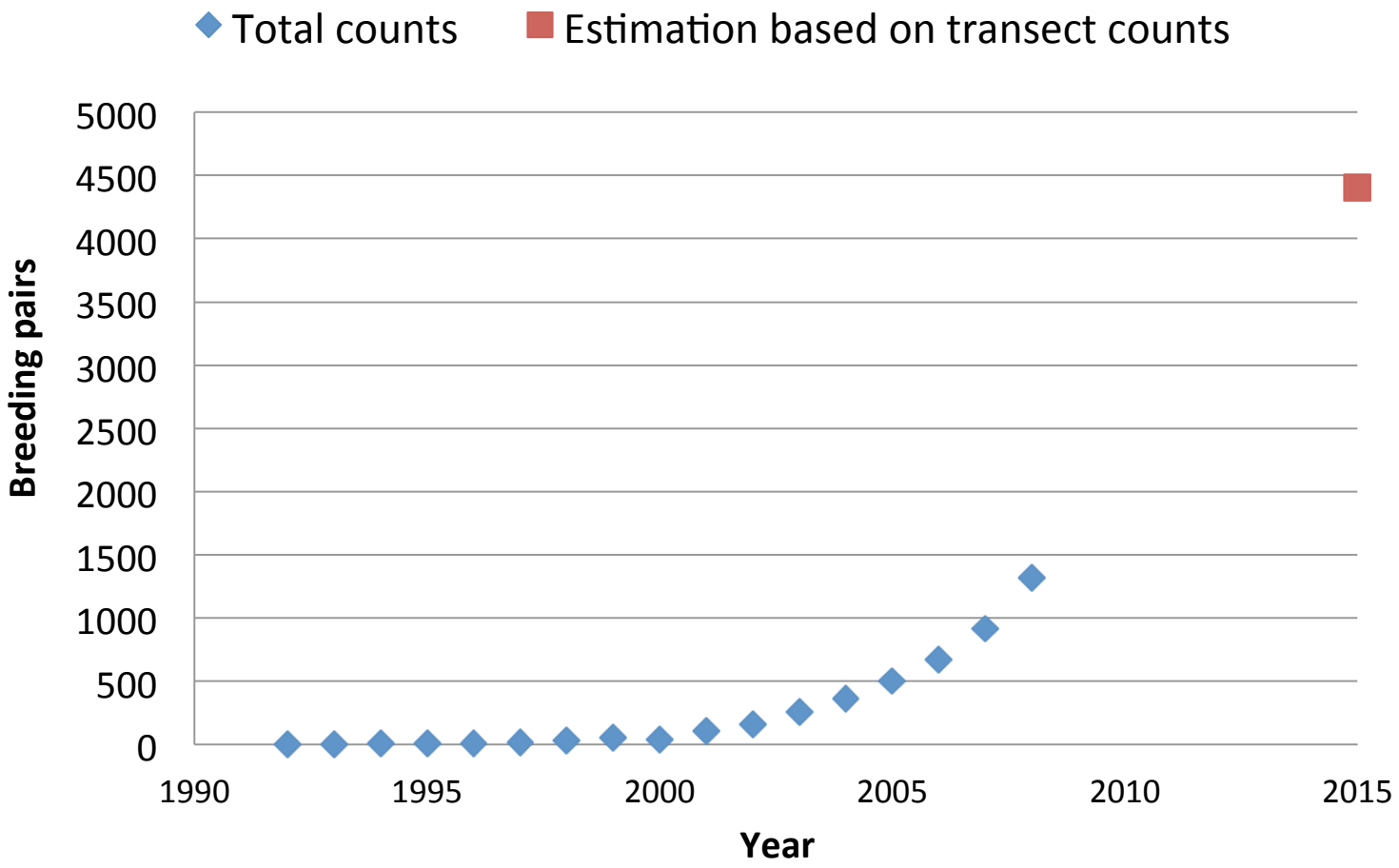
Origin of hazards

 **Barnacle Goose**	Russian/Baltic migrants	passage roosting (in the vicinity) wintering (in the vicinity)
	Local breeders	rural (urban potential)

Origin of hazards

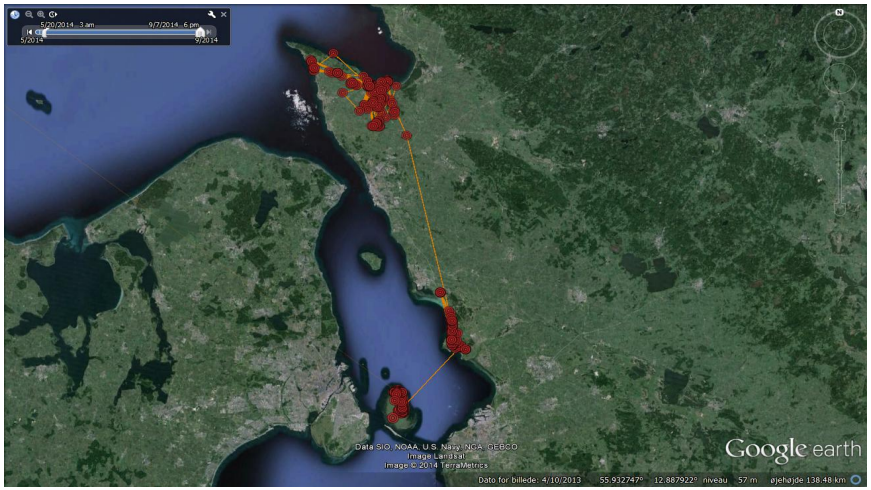
 **Barnacle Goose**	Russian/Baltic migrants	passage roosting (in the vicinity) wintering (in the vicinity)
	Local breeders	rural (urban potential)

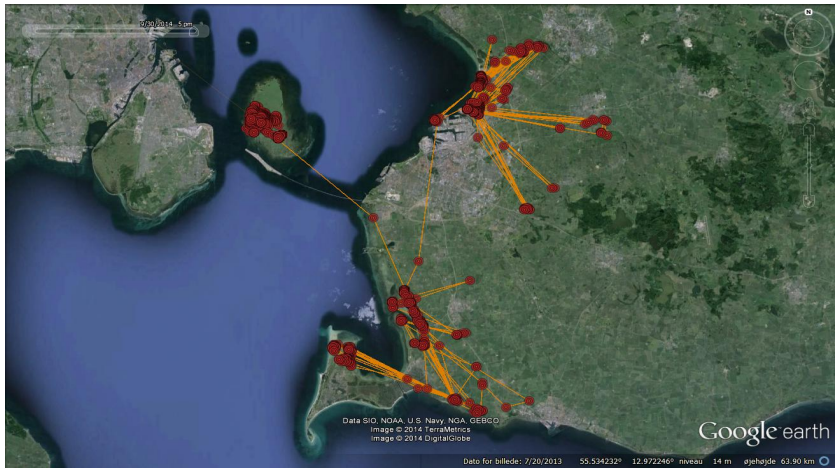
The breeding population of Barnacle Goose on Saltholm



Source: C.E. Mortensen. Dansk Orn. Foren. Tidsskr. 105 (2011): 159-166. & The Danish Nature Agency

GPS monitoring breeding Barnacle Geese at Saltholm

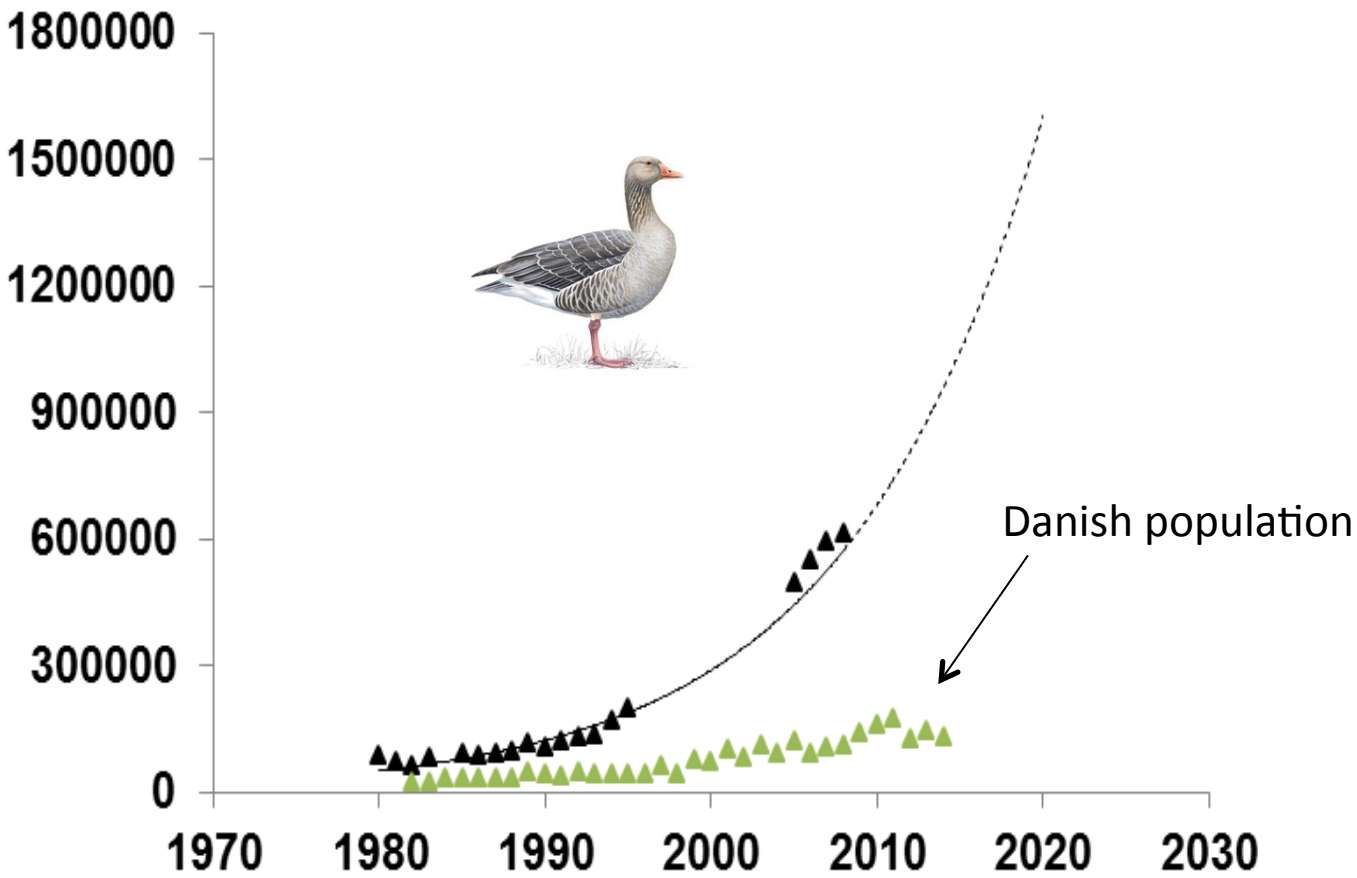




Barnacle Goose

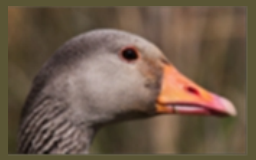
Greylag Goose

West European population of Greylag Goose



Source: Bioscience, Aarhus University

Origin of hazards

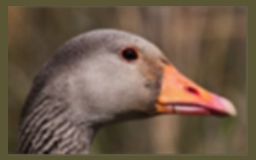
 **Greylag Goose**	Baltic migrants	passage roosting (in the vicinity) wintering (in the vicinity)
	Local breeders	rural urban staging juveniles
	40,000 moulting geese Saltholm	passage pre/postmoult roosting

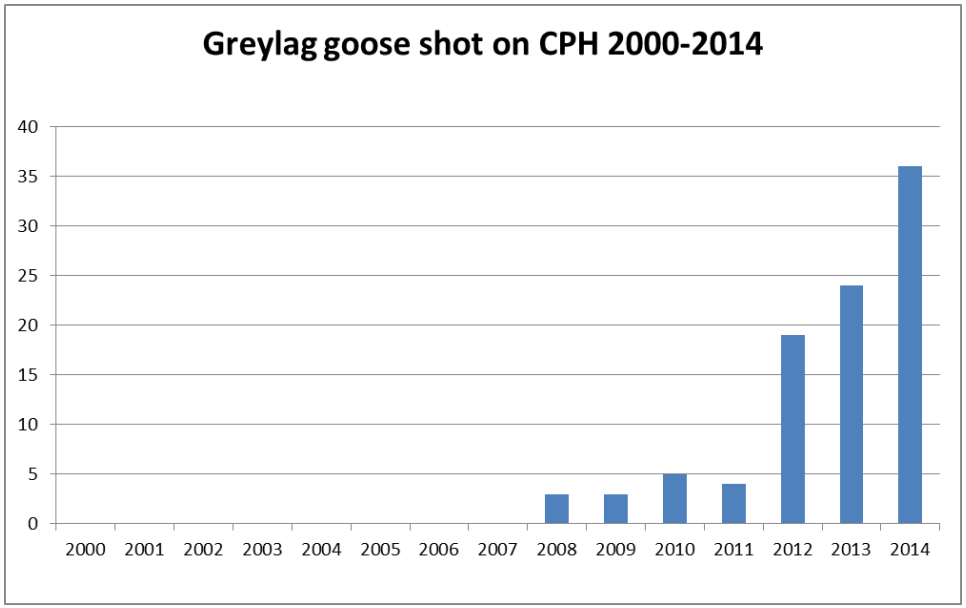
AARHUS UNIVERSITY
DEPARTMENT OF BIOSCIENCE

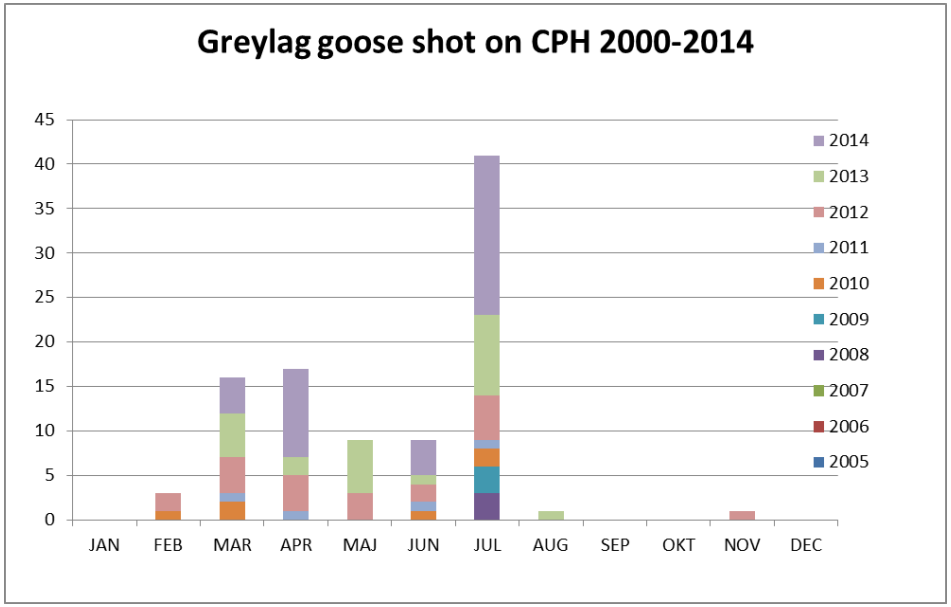
Source: Bioscience, Aarhus University

CPH

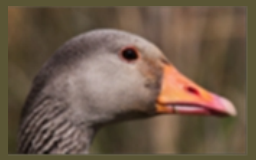
Origin of hazards

 **Greylag Goose**	Baltic migrants	passage roosting (in the vicinity) wintering (in the vicinity)
	Local breeders	rural urban staging juveniles
	40,000 moulting geese Saltholm	passage pre/postmoult roosting


Greylag goose shot on CPH 2000-2014
40
35
30
25
20
15
10
5
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014


Greylag goose shot on CPH 2000-2014
45
40
35
30
25
20
15
10
5
0
JAN
FEB
MAR
APR
MAJ
JUN
JUL
AUG
SEP
OKT
NOV
DEC
2014
2013
2012
2011
2010
2009
2008
2007
2006
2005

Origin of hazards

 **Greylag Goose**	Baltic migrants	passage roosting (in the vicinity) wintering (in the vicinity)
	Local breeders	rural urban staging juveniles
	40,000 moulting geese Saltholm	passage pre/postmoult roosting

Monitoring moulting Greylag Geese

AARHUS UNIVERSITY
DEPARTMENT OF BIOSCIENCE

CPH

Solutions?

Origin of hazards

Barnacle Goose	Russian/Baltic migrants	passage roosting (in the vicinity) wintering (in the vicinity)
Greylag Goose	Baltic migrants	passage roosting (in the vicinity) wintering (in the vicinity)

Depending on West European govermental coorporation to control the overall population size

Solutions?

Origin of hazards

Barnacle Goose	Russian/ Baltic migrants	passage roosting (in the vicinity) wintering (in the vicinity)	Habitat modification depending on national govermental/municipal/ airport coorporation to conduct and finance
Greylag Goose	Baltic migrants	passage roosting (in the vicinity) wintering (in the vicinity)	

Solutions?

Origin of hazards

Barnacle Goose	Local breeders	rural (urban potential)	Goose mitigation depending on national govermental/municipal/ airport coorporation to conduct and finance
Greylag Goose	Local breeders	rural urban staging juveniles	
	40,000 moulting geese Saltholm	passage pre/postmoult roosting	

- Identify the hazard
- Investigate with the aim of improving and documenting the hazards
- Highlight the best measures to mitigate the hazard
- Risk assessment of:
  - consequences of doing nothing
  - consequences of undesirable outcome of the mitigation
- Identify successful solutions involving national/regional legislators.

AARHUS
UNIVERSITY
DEPARTMENT OF BIOSCIENCE

CPH