Crippling of waterbirds by shotgun shooting: some scientific background from Danish research

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Teamwork

Wildlife ecologists, weapon and ammunition experts, statisticians, veterinarians, social scientists

Catching pink-footed geese, Oulu, Finland, April 2018

Contents of presentation

- History of research into crippling in Denmark
- The extent of crippling with a focus on waterfowl
- The contribution of crippling in total losses (harvest) caused by hunting and their inclusion in harvest estimates to ensure sustainability
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- The role of research and monitoring in developing a management approach and achieving change

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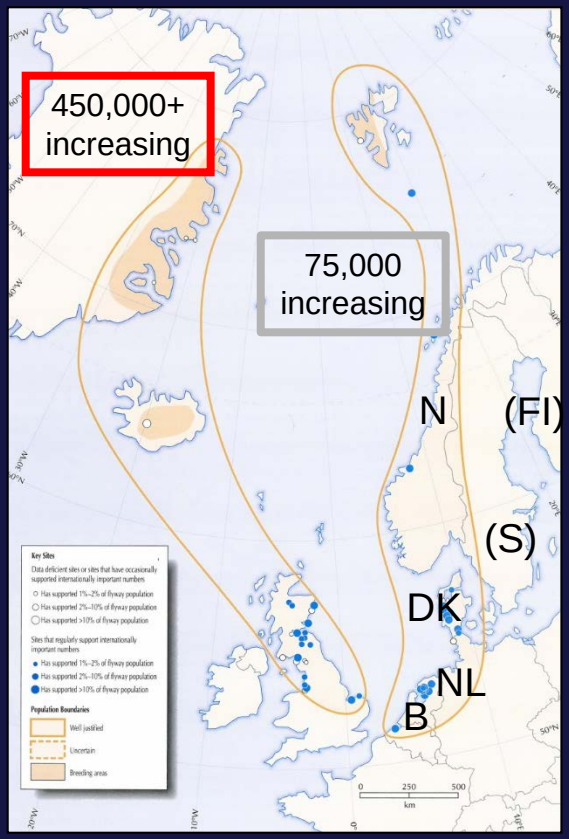
Crippling of pink-footed geese by shotgun shooting: model case

Part of a research and monitoring program since 1990

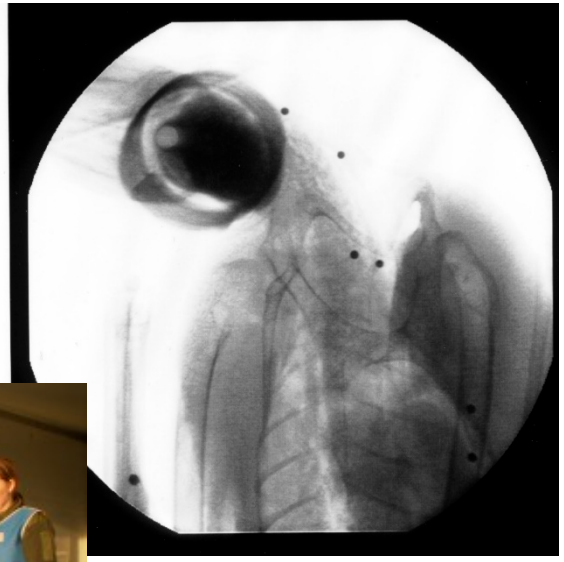
Funding: Aarhus University / Danish Ministry of Environment / Danish Research Councils

Pink-footed Goose:
Two almost discrete populations

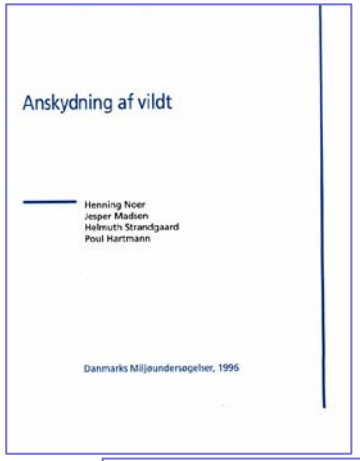



Hunted in Denmark and Norway
Protected in the Netherlands and Belgium

X-raying statistically robust numbers at times when the population is concentrated



Publication of scientific work (1996) leading to national action plan (1997)



Shotgun pellet loads and infliction rates in pink-footed geese Anser brachyrhynchus

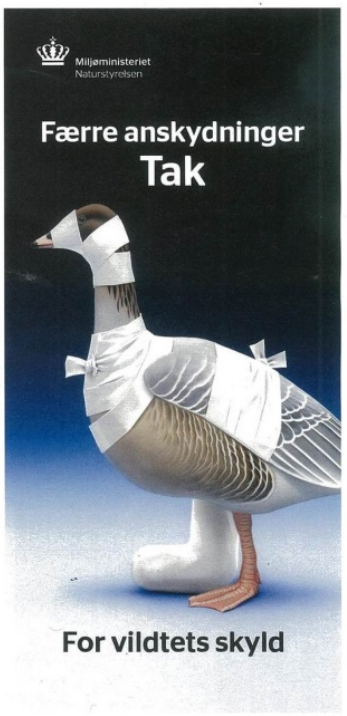
Authors: Noer, Henning, and Madsen, Jesper
Source: Wildlife Biology, 2(3) : 65-73
Published By: Nordic Board for Wildlife Research
URL: https://doi.org/10.2981/wlb.1996.034

Decreased survival of pink-footed geese Anser brachyrhynchus carrying shotgun pellets

Authors: Madsen, Jesper, and Noer, Henning
Source: Wildlife Biology, 2(3) : 75-82
Published By: Nordic Board for Wildlife Research
URL: https://doi.org/10.2981/wlb.1996.035

National action plan to prevent crippling of game

By the National Wildlife Management Board
& the Ministry of Environment
1997



Immediate actions taken
Raising awareness
Filling knowledge gaps
Monitoring effects of action plan
Follow-up actions taken

Game species included

Birds:

- Pink-footed goose
- Greylag goose
- Mallard
- Eider duck
- Common scoter
- Goldeneye
- Tufted duck
- Wood pigeon
- Pheasant

Mammals:

- Roe deer
- Red fox
- European hare

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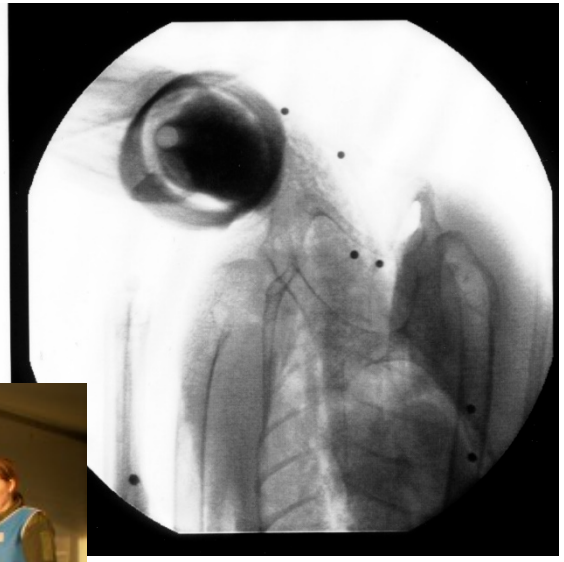
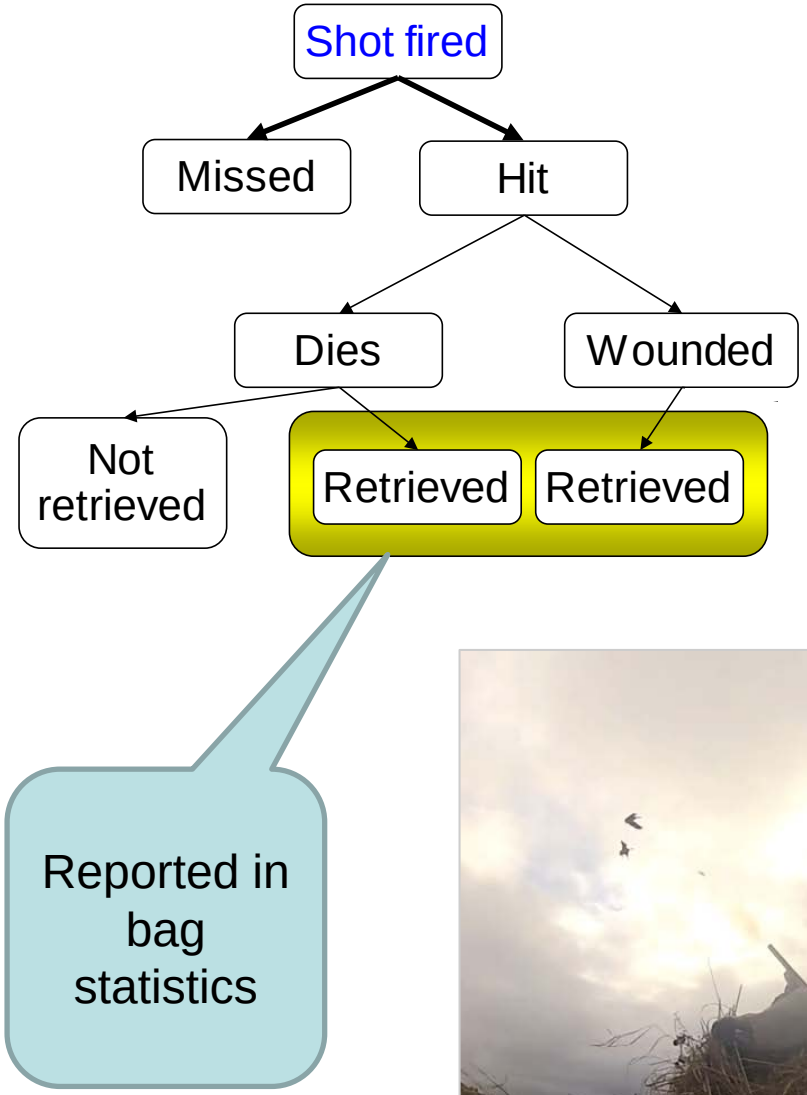
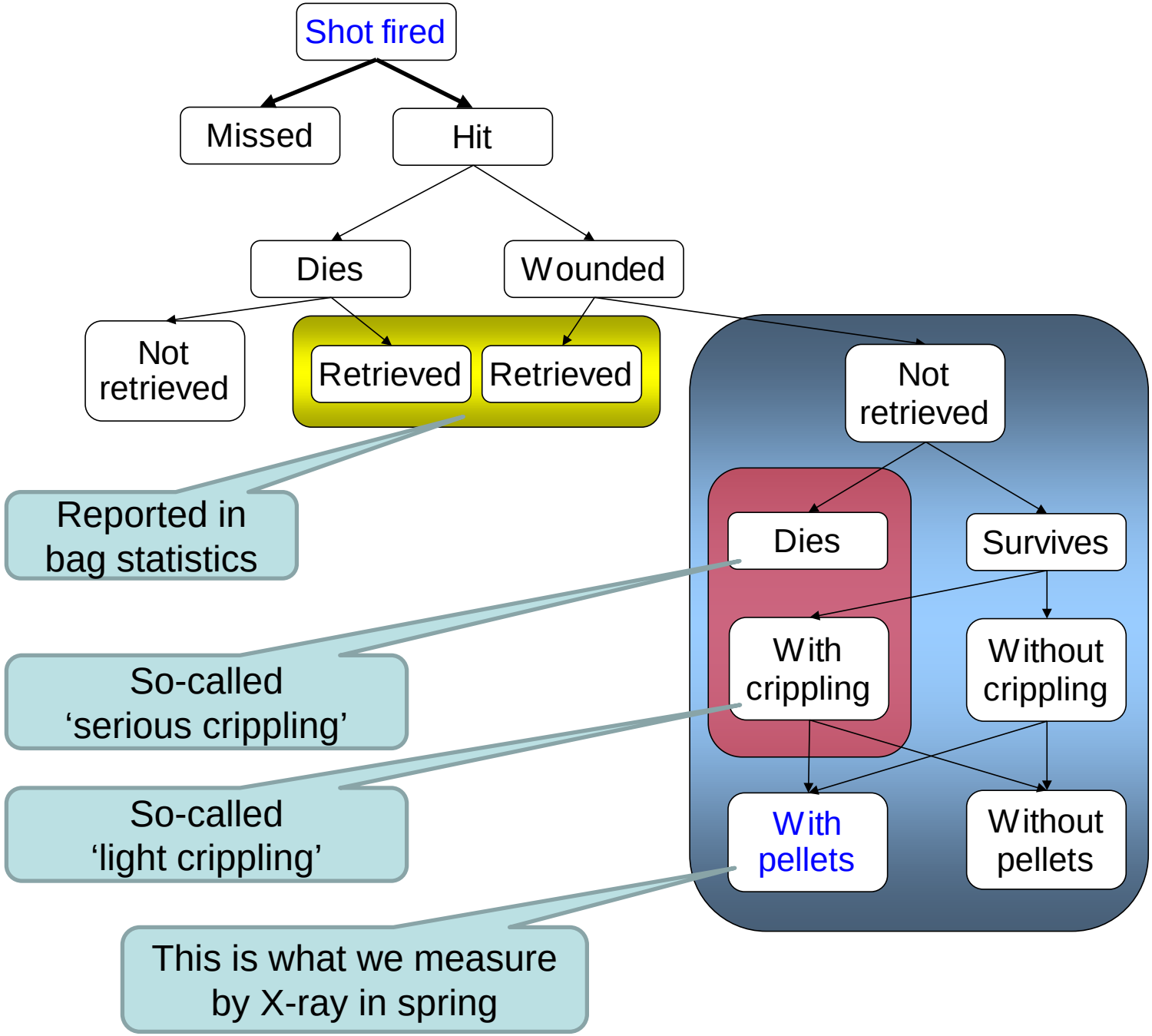
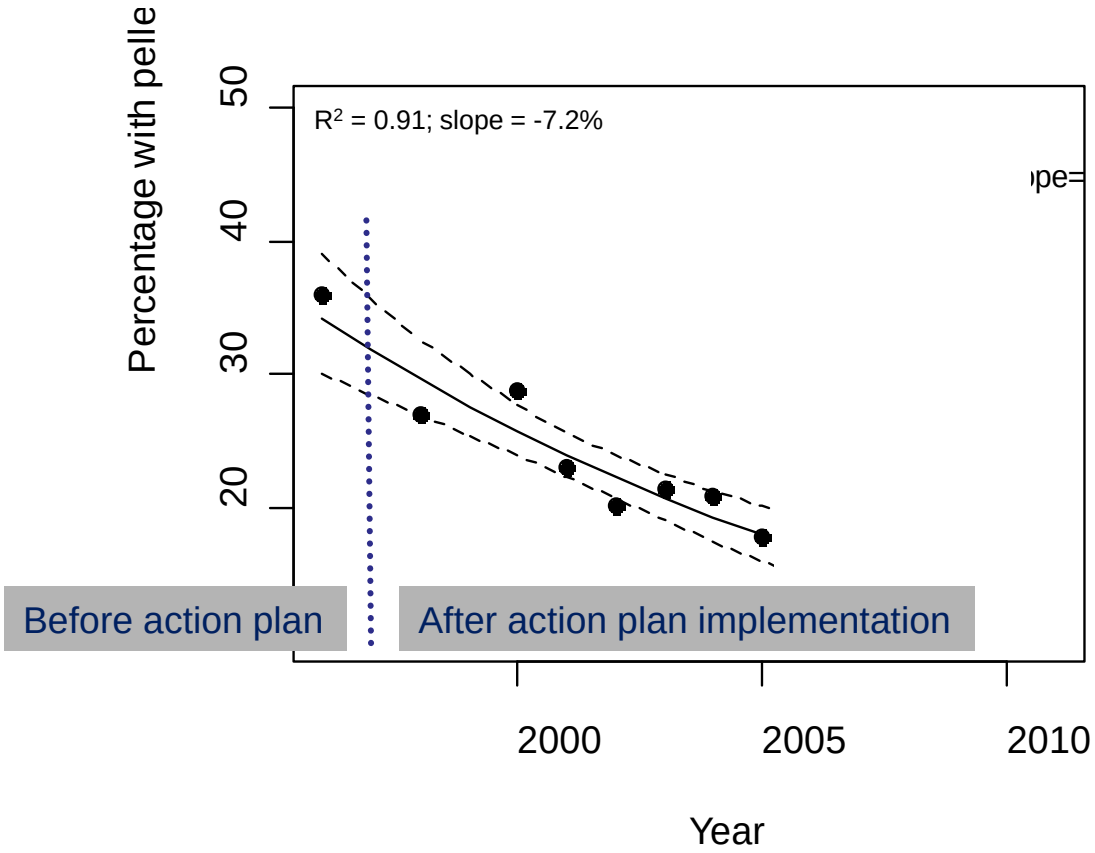
What is crippling?
And what do we measure by X-raying in spring?




Shot fired
Missed
Hit
Dies
Wounded
Not retrieved
Retrieved
Retrieved
Reported in bag statistics

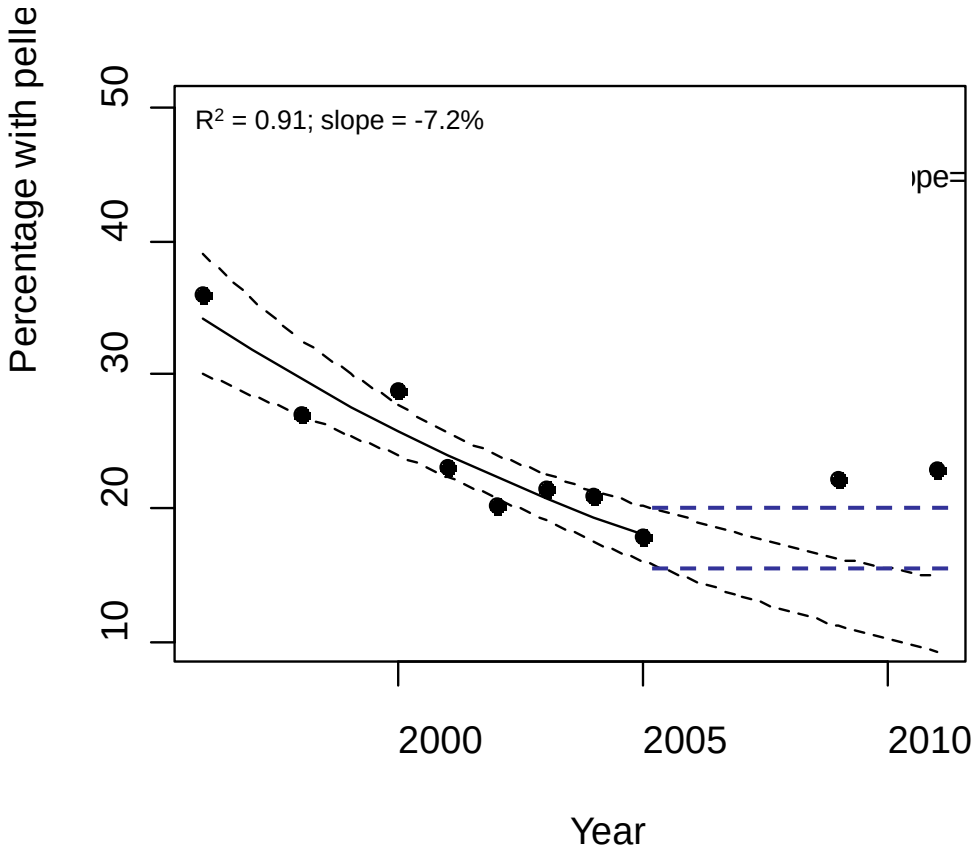

Shot fired
Missed
Hit
Dies
Wounded
Not retrieved
Retrieved
Retrieved
Not retrieved
Dies
Survives
With crippling
Without crippling
With pellets
Without pellets
Reported in bag statistics
So-called 'serious crippling'
So-called 'light crippling'
This is what we measure by X-ray in spring

Proportion (%) of adult pinkfeet with shotgun pellets in tissue before and after implementation of Danish action plan to reduce crippling (1997)

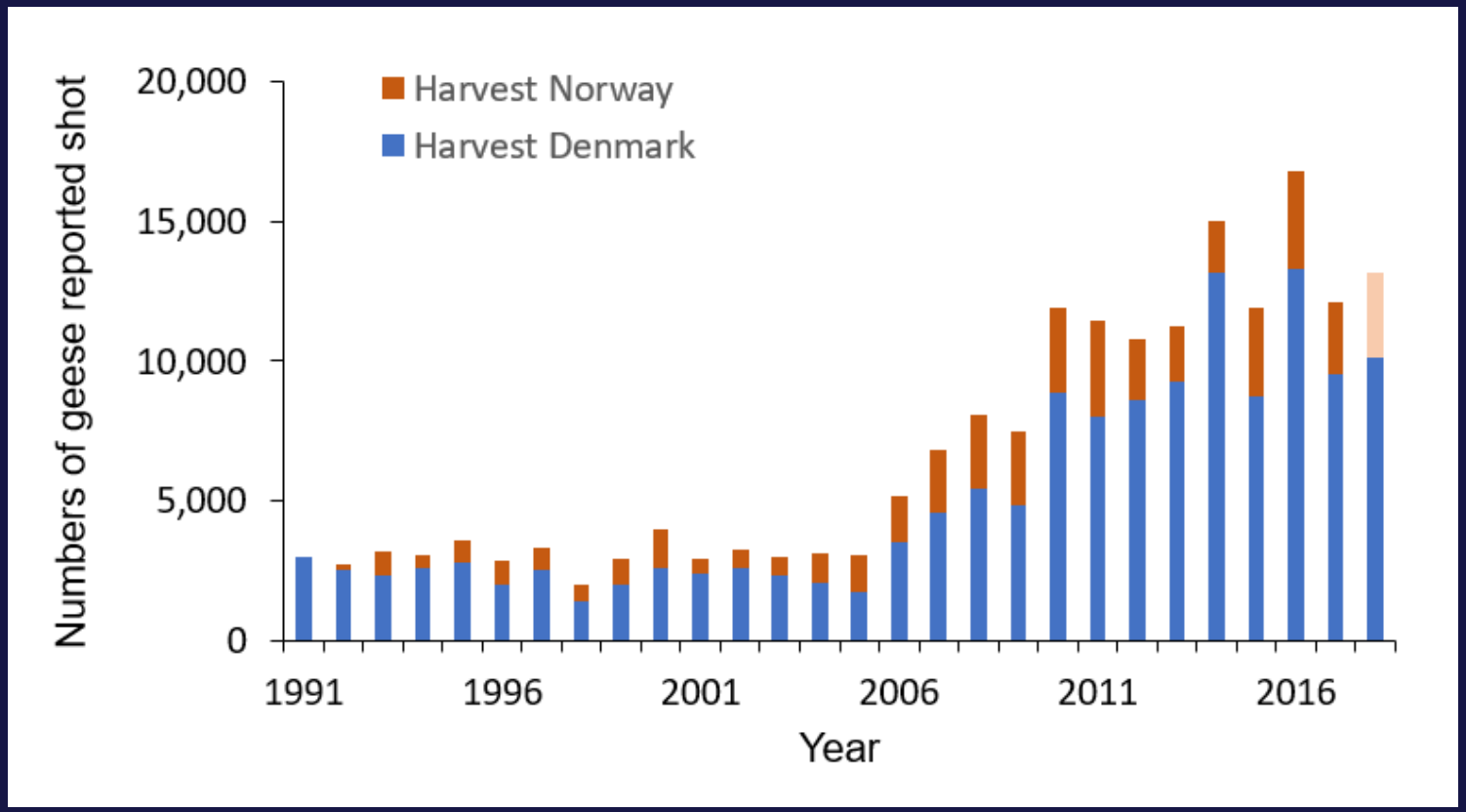


Noer, Madsen & Hartmann, J. Applied Ecology (2007)

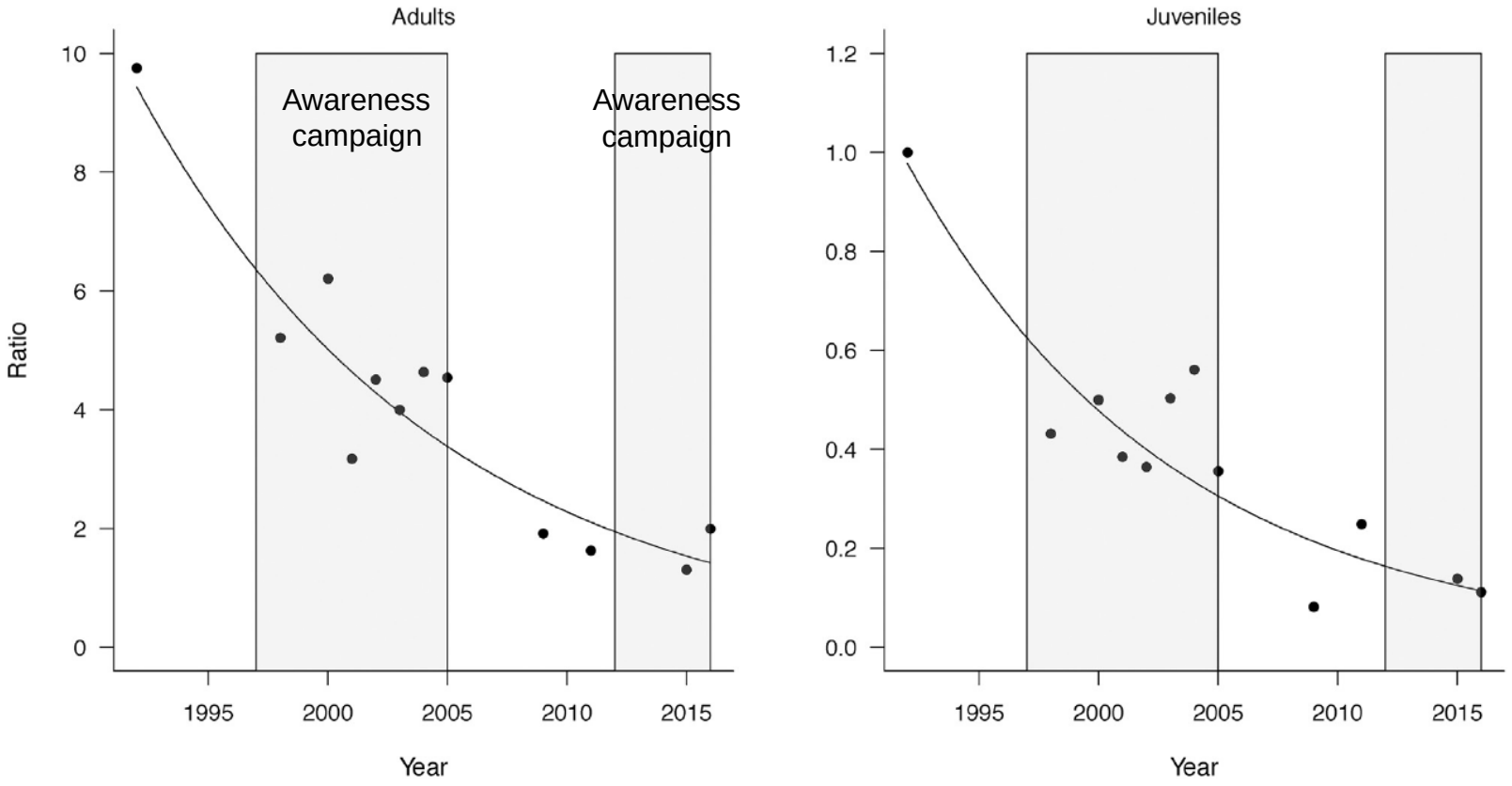
More recent crippling rates were above the expected trend
Why?



Total harvest and the population harvest rate have increased in response to changes in migratory behaviour and adaptive harvest management program to maintain a stable population (Madsen et al. 2017, Ambio)



Crippling ratio: crippling rate taking into account harvest rate
Shows continued downward trend



Clausen, Holm, Haugaard & Madsen, Ecological Indicators (2017)

Prevalences and selected trends in crippling, 1990s – 2010s

Birds:

- Pink-footed goose (36 -> 23%)
- Greylag goose (32%)
- Barnacle goose (11%)
- Mallard (15%)
- Eider duck males (34 -> 22%)
- Common scoter (10%)
- Goldeneye (14%)
- Tufted duck (11%)
- Wood pigeon (3%)
- Pheasant (6%)

Mammals:

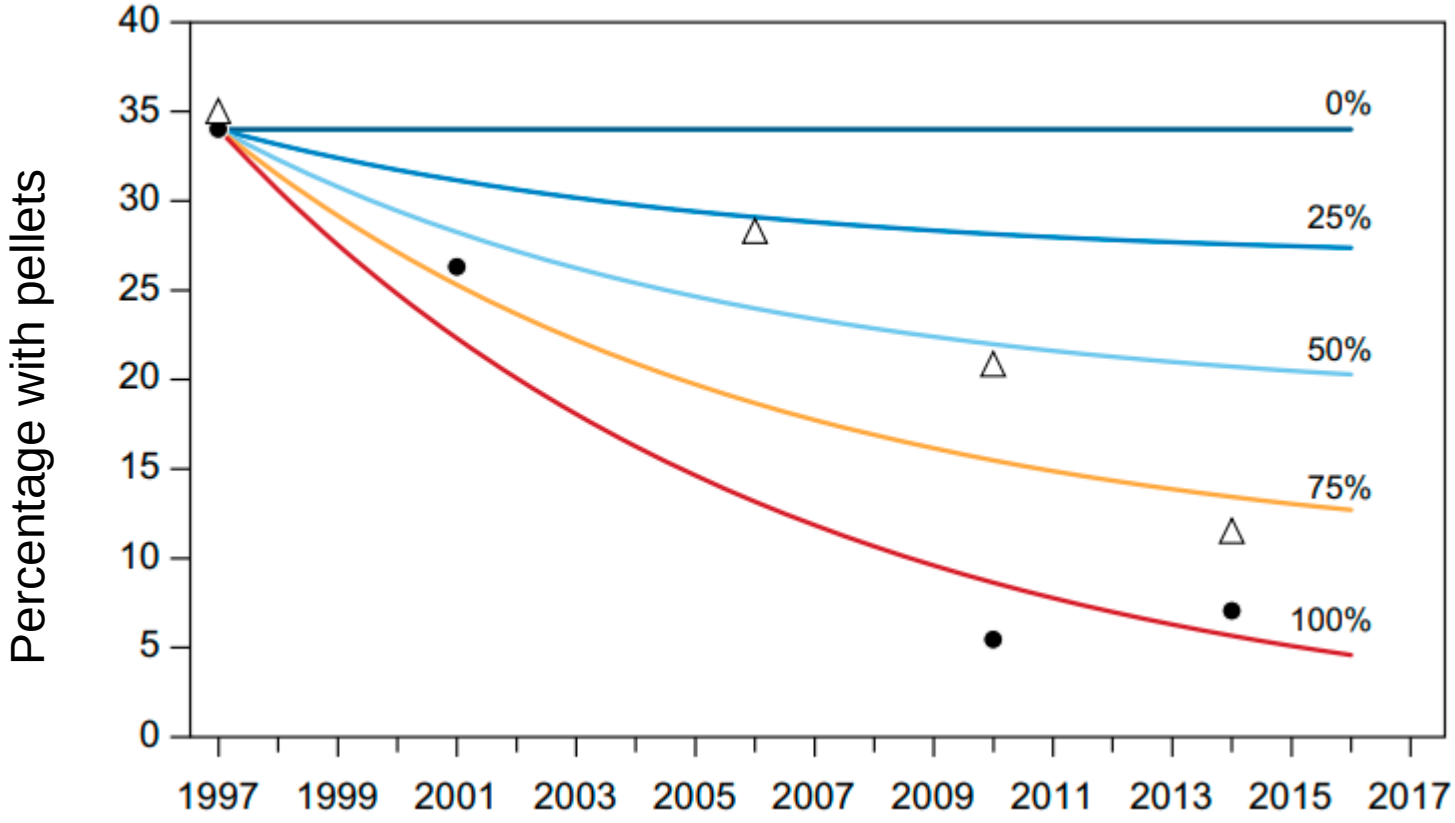
- Roe deer (5% -> 3%)
- Red fox (25% -> 9%)
- European hare (8%)

Holm et al., Aarhus University report (2015)

Eider duck crippling rates

triangles: males

filled circles: females



Holm & Haugaard, Bird Study 2013; Holm et al., AU report 2015)

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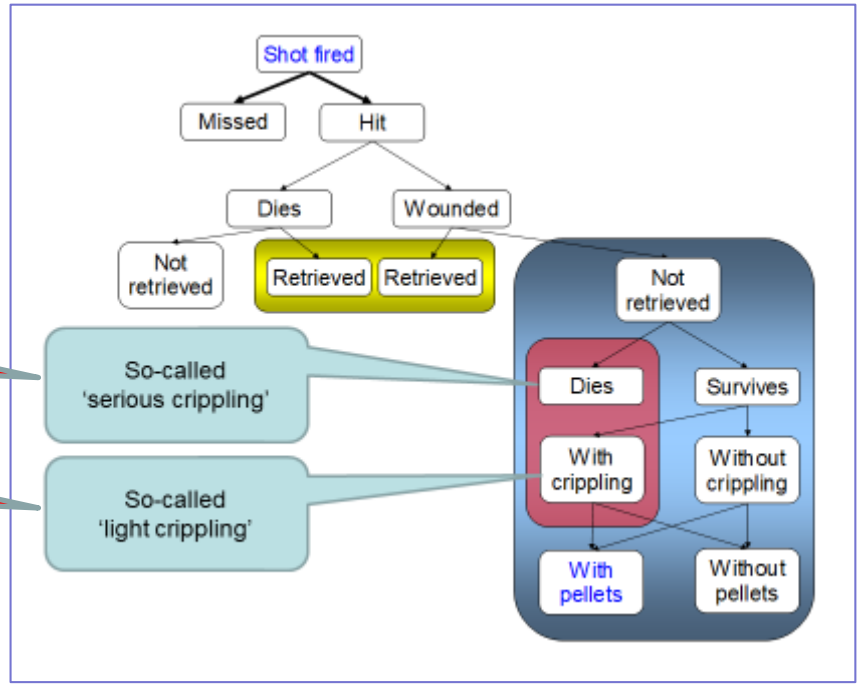
Contribution of crippling in total losses

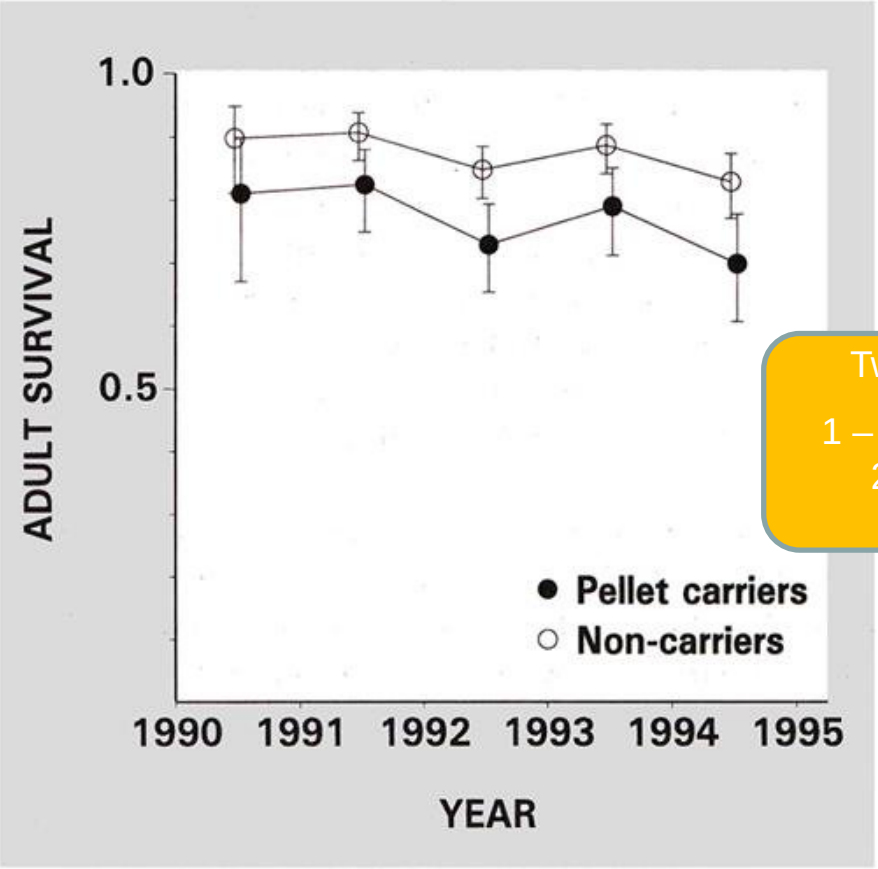
- Not retrieved *seriously crippled* individuals
- Not retrieved *lightly crippled* individuals



Eider duck: 9%
Pink-footed goose: 8%

Eider duck: ?%
Pink-footed goose: ?%

Impact of crippling on survival in adult pink-footed geese caught in spring

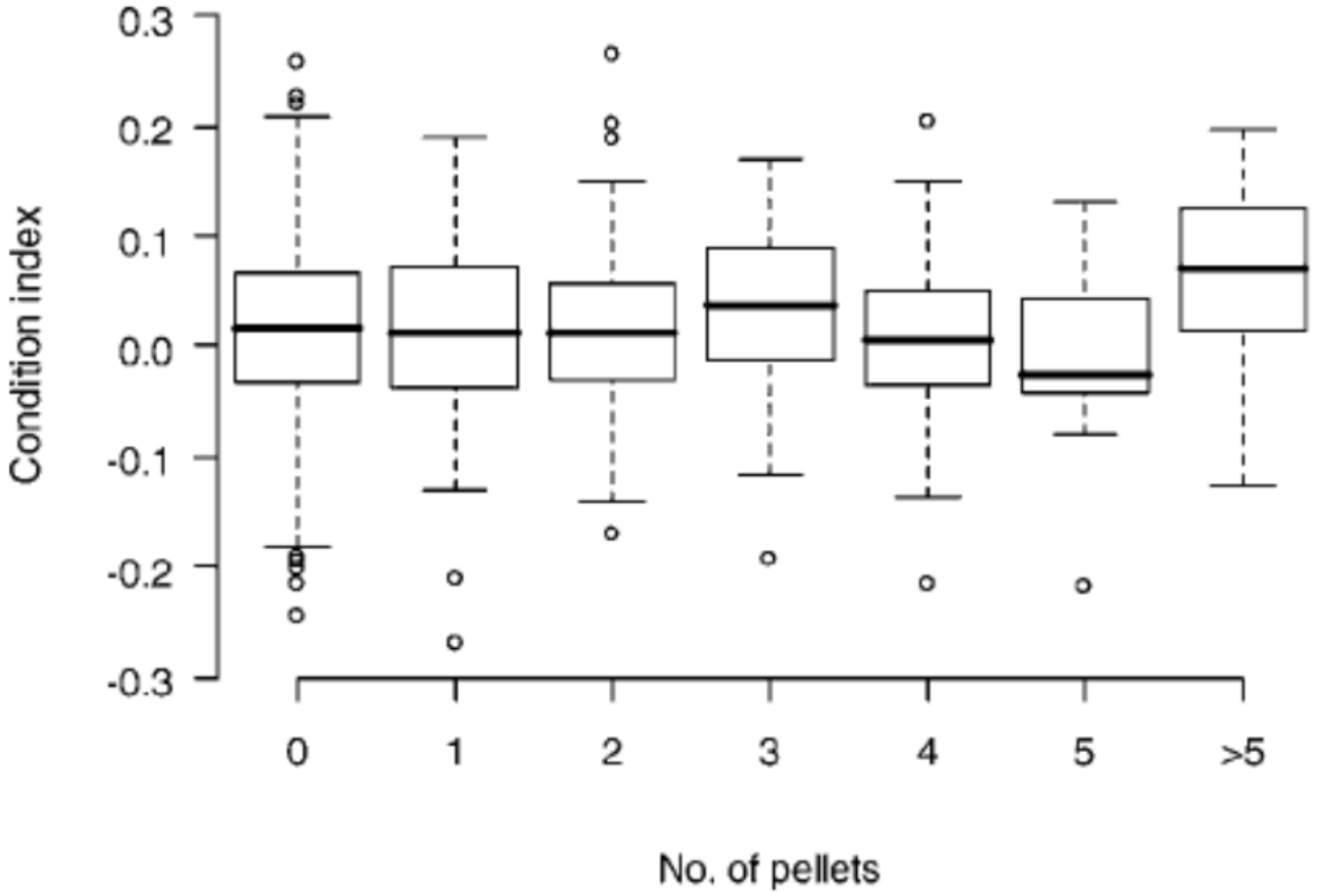


Two alternative hypotheses:

1 – Long-term injury hypothesis
2 – Selective vulnerability hypothesis

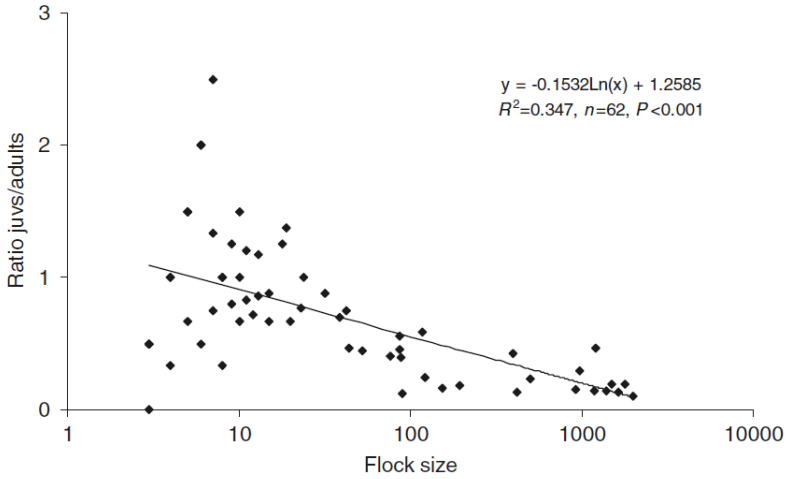
Madsen & Noer, Wildlife Biology (1996)

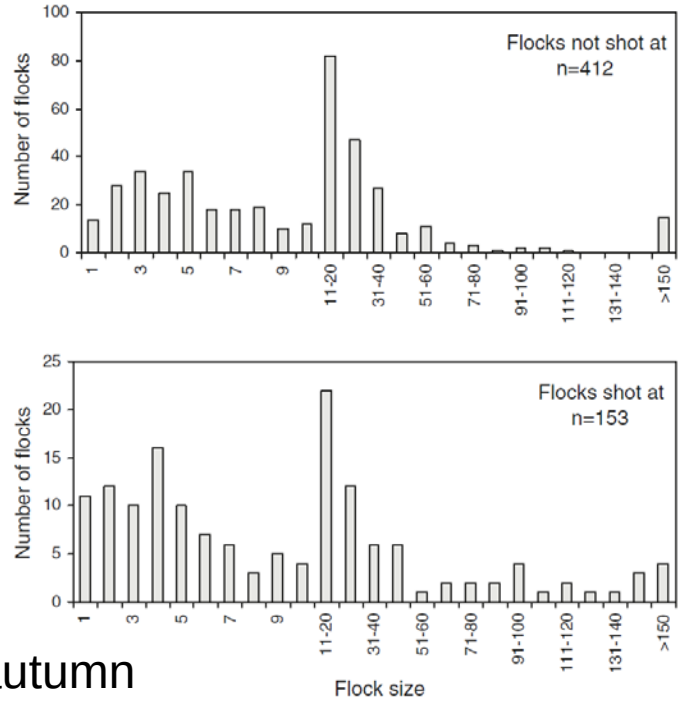
Impacts of crippling on body condition in pink-footed geese caught in spring?



Madsen & Rigét, J. Wildlife Management (2007)

Selective vulnerability to hunting by juvenile geese and their parents





Line of argument:

1. Families primarily fly in small flocks during autumn
2. Hunters' shooting opportunities are largely independent of flock size
3. The risk that families and parents are shot at is much higher than for non-breeders
4. There is an increased risk that parents are shot at more often than non-breeders
5. It is a relatively small segment of the population which breeds successfully
6. Breeding birds are more vulnerable to being crippled (and killed)

Madsen, European J Wildlife Research (2010)

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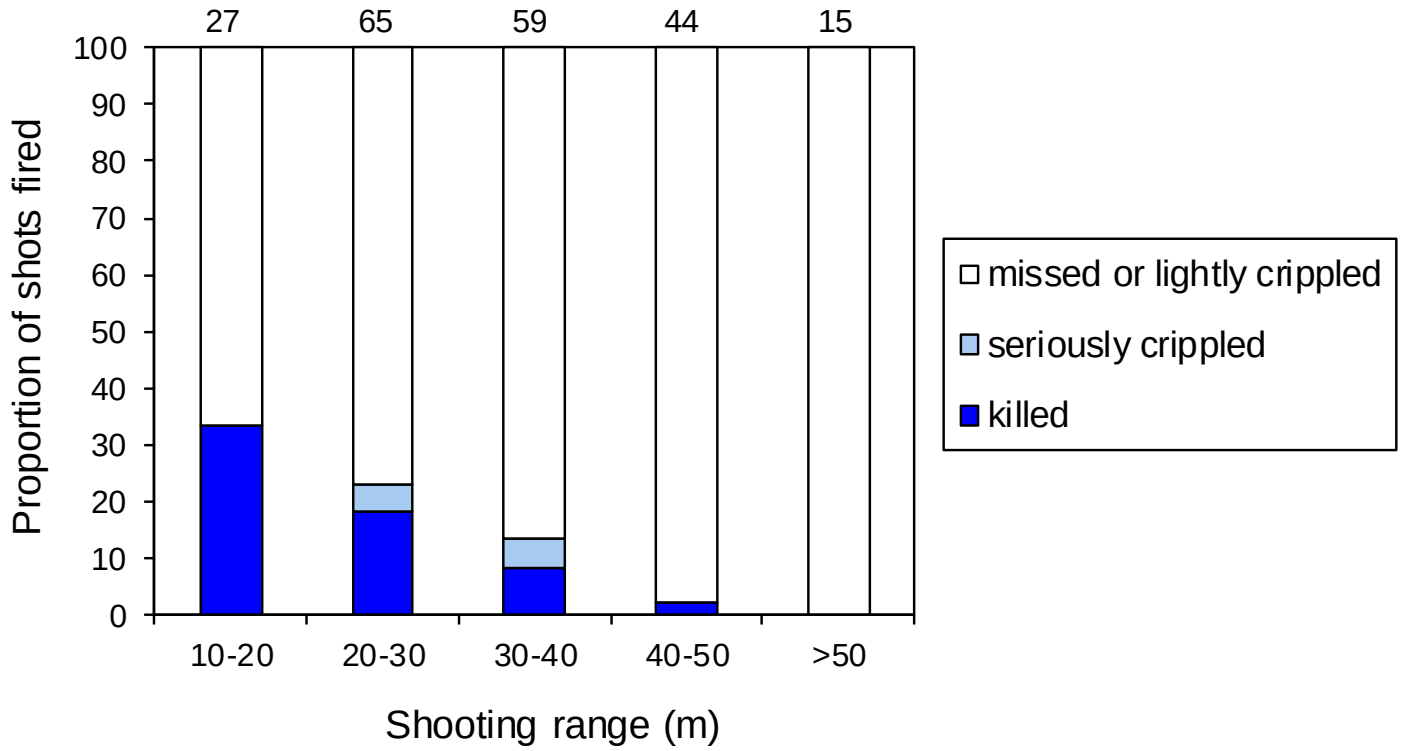
Causes of crippling examined:

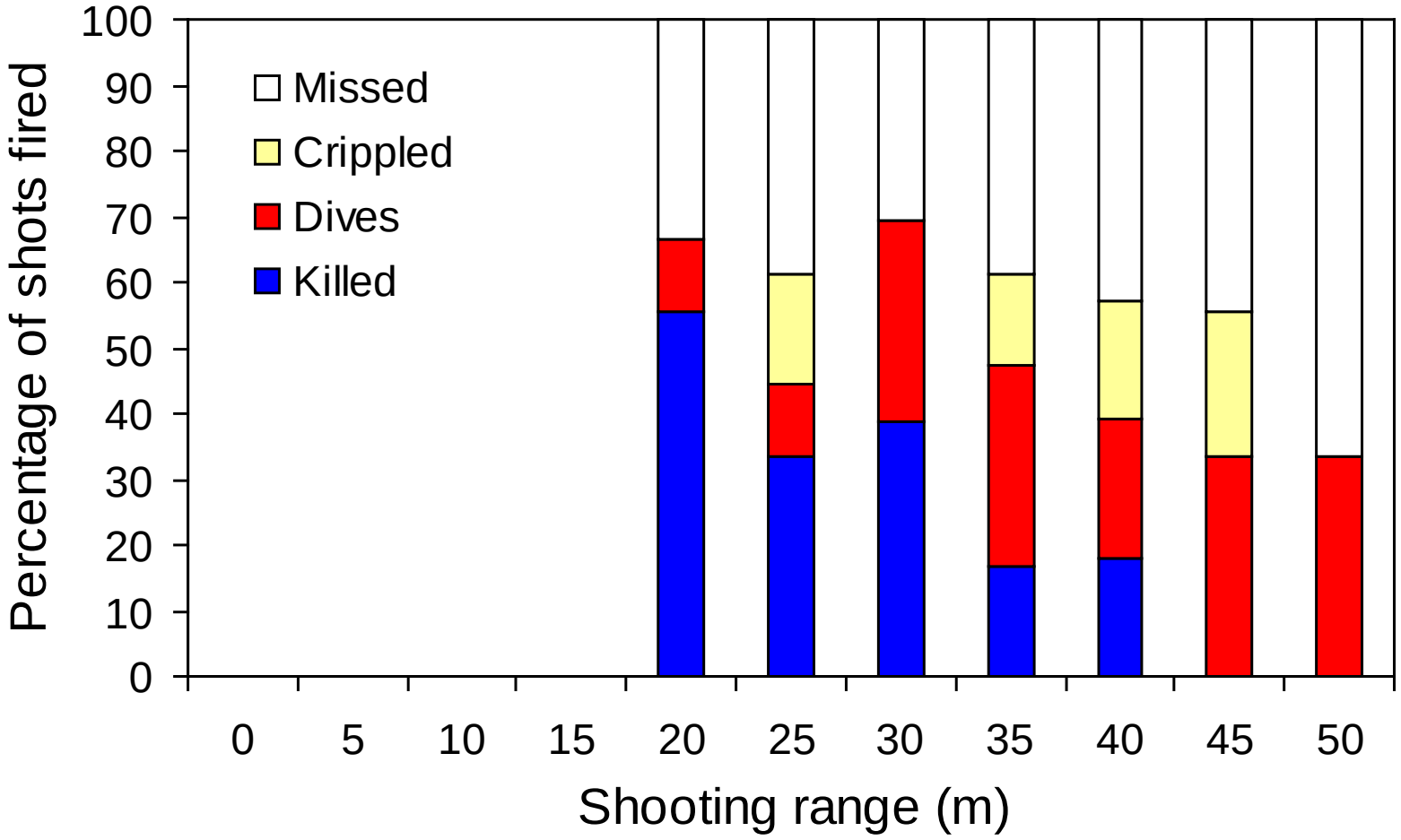
- Use of ammunition and shotguns
- Use of retrieving dogs (in Denmark a retrieving dog has become mandatory)
- Shooting skills
- Goose shooting practises
- Shooting range (recommended range for geese in Denmark: 25 m)

Efficiency of shooting pink-footed geese



Holm et al., Aarhus University report (2015)

Efficiency of shooting of eider ducks from motor boats



Holm et al., Aarhus University report (2015)

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Recommendations based on the research

Ways to avoid crippling:

- Stick to the recommended max. shooting range (25 m for geese; 30 m for ducks)
- Train shooting and judgement of shooting range under realistic conditions
- Shoot geese when they come into fields, not on passage
- Shoot in teams if possible
- Choose the right ammunition and shotgun
- Use a retrieving dog

Recommendations based on the research

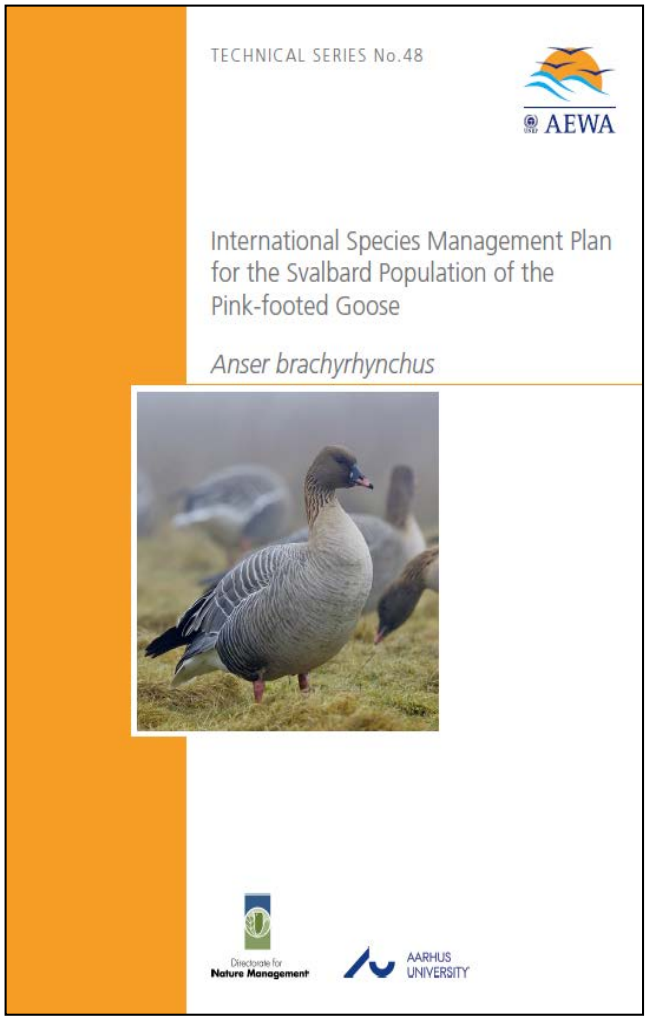
Ways to monitor crippling:

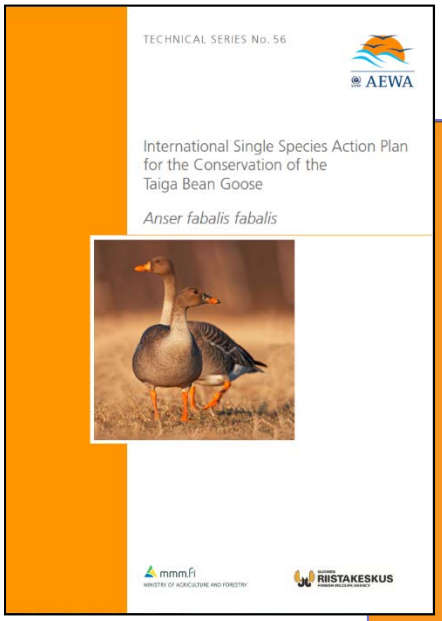
- The percentage of adults and juveniles with pellets
- The ratio between killed and crippled
- The crippling ratio, crippling rate corrected for harvest rate (requires demographic data and harvest data)
- Shooting performance
  - Direct field observations of ratio crippled/shot
  - Number of cartridges used per killed bird (rule of thumb < 3)

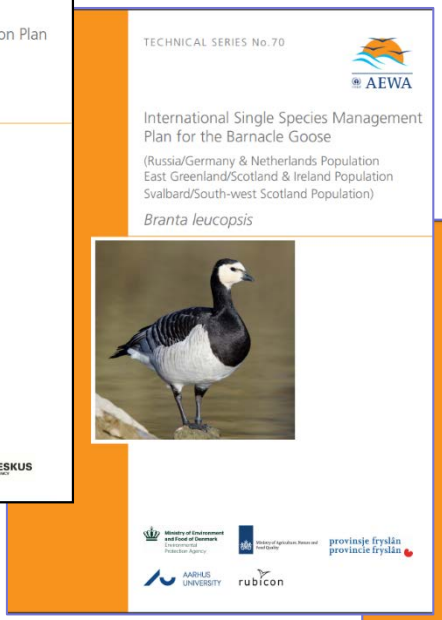
Research impact

- The Danish action plan to reduce crippling (1997), tailored by the Danish Wildlife Management council, the Ministry of Enviromment, and the Danish Hunters' Association, was a direct political/management response to the scientific evidence provided
- The progress of the action plan has been monitored => repeated awareness campaigns
- Open questions have been scientifically addressed to find solutions => adjustments of regulations, training and recommended best practises
- Crippling has been implemented as an issue of concern in international flyway management plans

International goose management plans implemented under the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)







AEWA
UNEP AEWA
AEWA European Goose Management Platform

CRIPPLING OF PINKFEET

In the International AEWA Single Species Management Plan for the pink-footed goose the following objective is stated as essential:

‘Ensure sustainable hunting where practised (at present in Norway and Denmark) and following ‘wise use’ principals, whilst ensuring that crippling rates are kept at a minimum level’

Not an easy objective to achieve because, at the same time, it was necessary to increase the harvest rate in order to control the population size according to international agreement

Actions taken:

- Develop understanding of hunters' behaviour and motivations
- Engage and train hunters in effective goose shooting (experimental voluntary demonstration projects in Norway and Denmark, 2010-2015)
- Develop practical and tailored training courses in effective goose shooting
- Local and national dissemination of outcomes
- Exchange of experiences internationally
- Engage local 'ambassadors' in ISSMP Working Groups nationally and internationally
- Continued monitoring and awareness campaigns

Thanks for your attention!

Photos:
John Frikke
Jørgen Peter Kjeldsen
Lars Waade
Magnus Elander
Per Ivar Nicolaisen
Esko Pasanen