

Disturbance and management options to reduce disturbance

**SUSTAINABLE WATERBIRDS HARVESTING AND CONSERVATION TRAINING WORKSHOP
LIFE16/NAT/BG000847 “LIFE for Safe Flight” Project**

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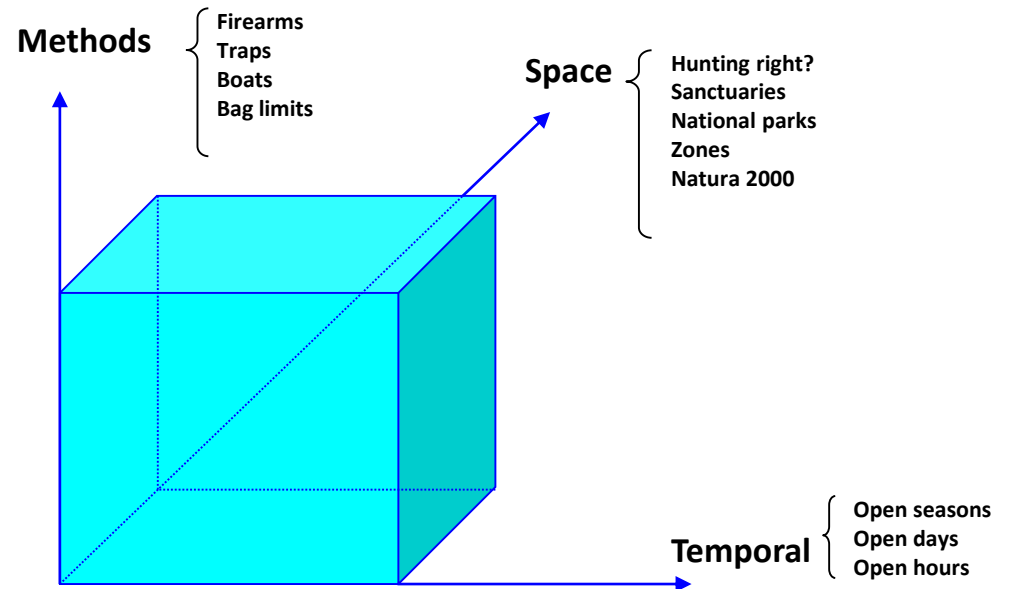
Content

- Disturbance – definition and levels
- Non-hunting zones
- Win-win

A model already mentioned

Disturbance can be managed on all dimensions.

However, spatial management has proven to be most effective.



Disturbance

Disturbance is a part of the
Hunting pressure = Harvest + **Disturbance** + Left items + more.

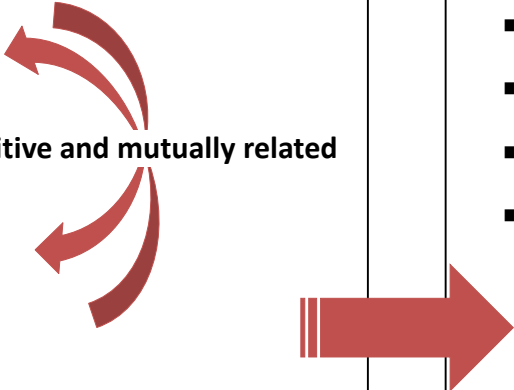
Disturbance from hunting:

- Shooting (noise)
- Traffic (driving, sailing, walking)
- Retrieving of shot game

Additive and mutually related

Disturbance from other sources:

- Access
- Traffic (driving, sailing walking)
- Loose dogs.

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- **Changed behaviour**
 - **Changed use of habitats**
 - **Increased energy consumption**
 - **Potential impact on conservation status**

Densities of *Zostera*, and distribution of Wigeon (*Anas penelope*) and Brent Geese (*Branta bernicla*) on days with and without hunting (Wadden Sea)

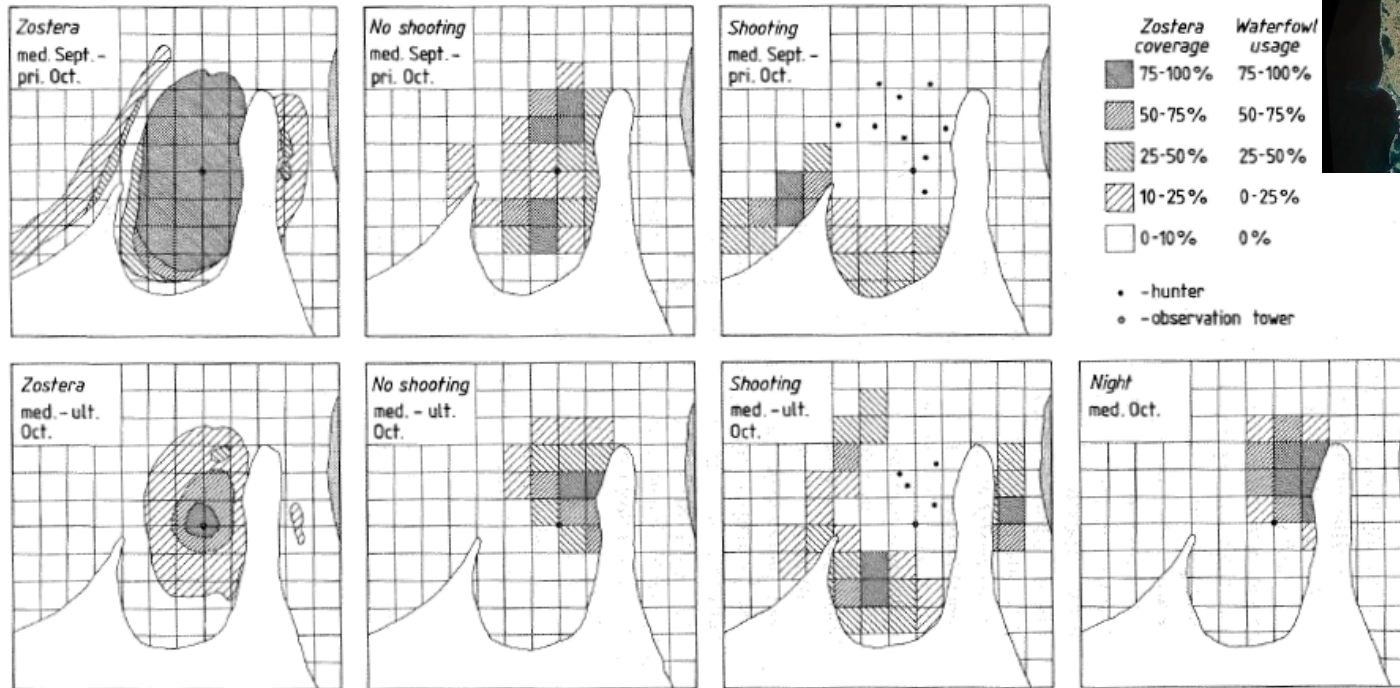
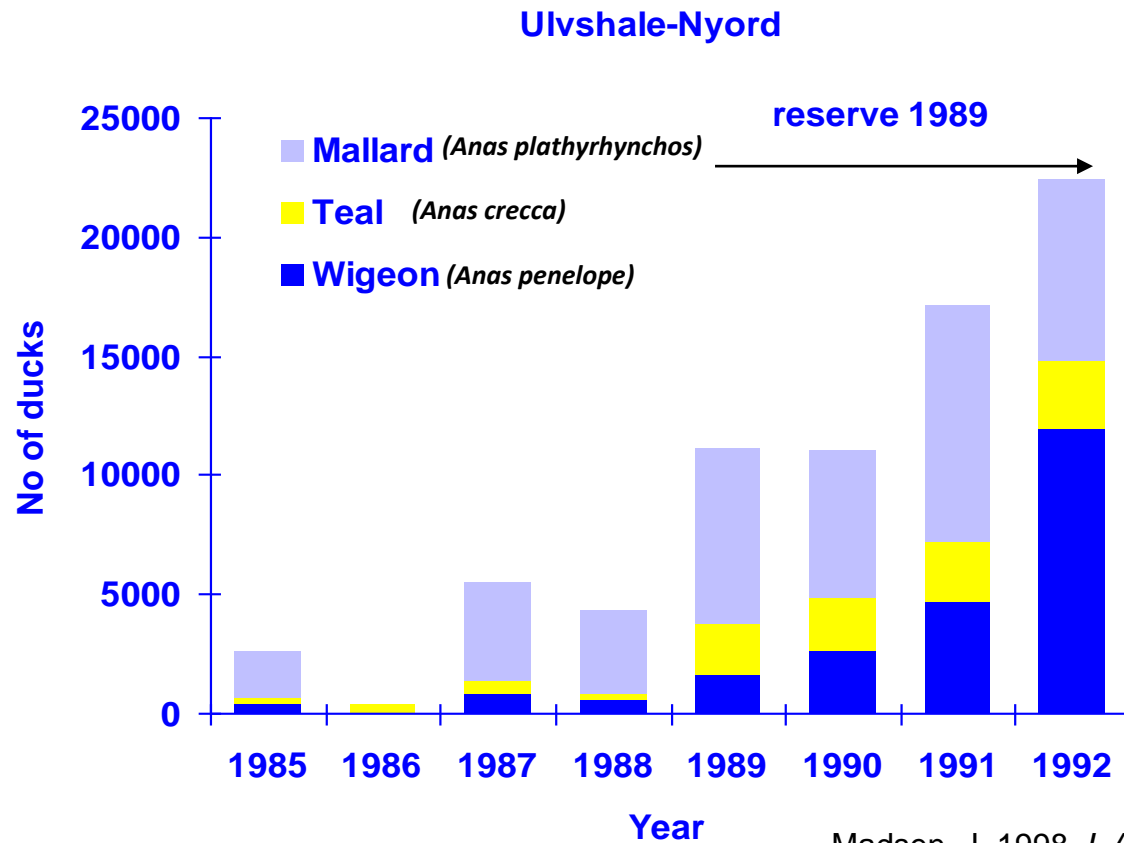


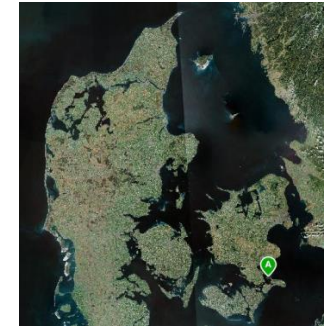
Fig. 8. *Zostera* resources and distribution of wildfowl (Brent Geese and Wigeon pooled) with and without hunting activity at Koldby Leje, during two stages in autumn 1986. Grid size is 200 m × 200 m. Waterfowl usage is expressed as percentage of the quadrat with the highest numbers. Each situation represents 2-3 complete low-water periods with mapping every ½ hr. The pooled numbers of hunters are shown.

Madsen, J. 1988 *Danish Review of Game Biology*

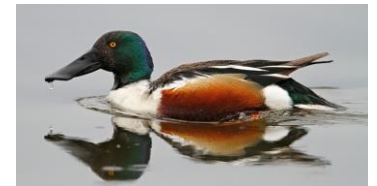
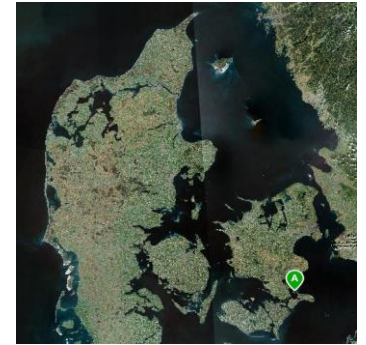
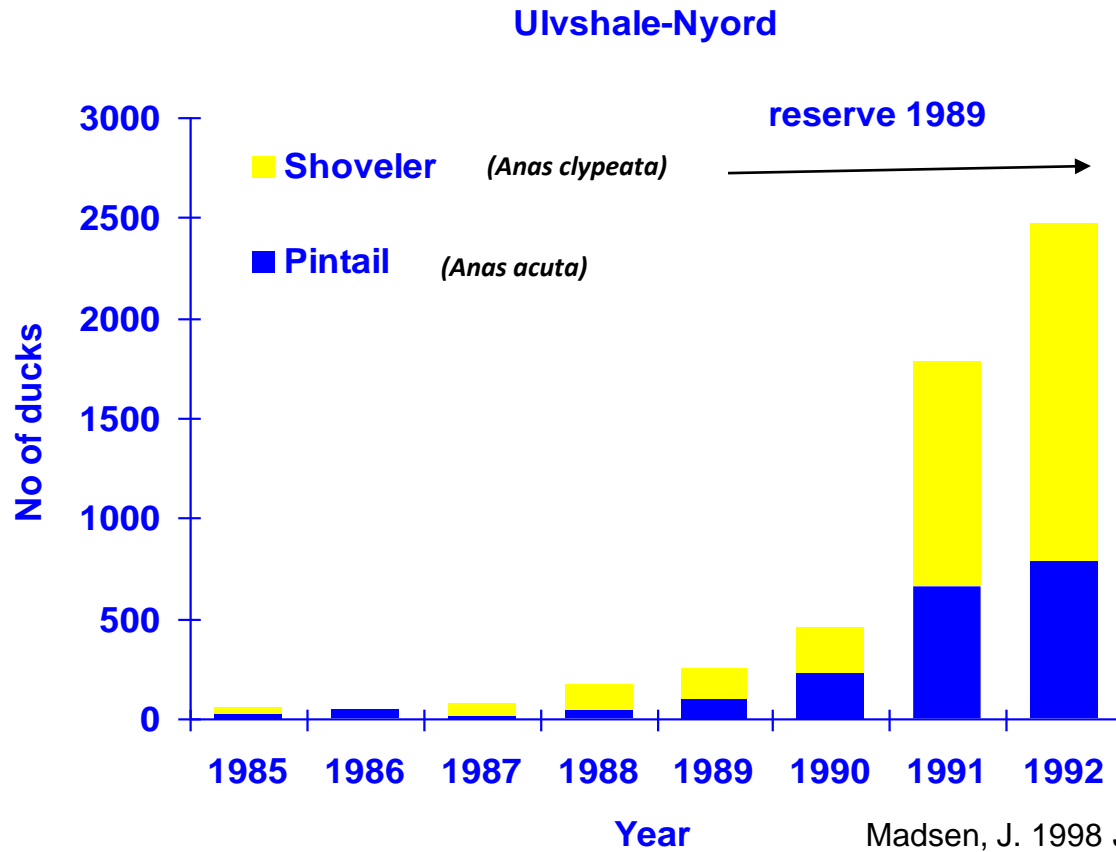
Knowledge from experimental reserves Before/After



Madsen, J. 1998 *J. Appl. Ecol.*



Knowledge from experimental reserves Before/After



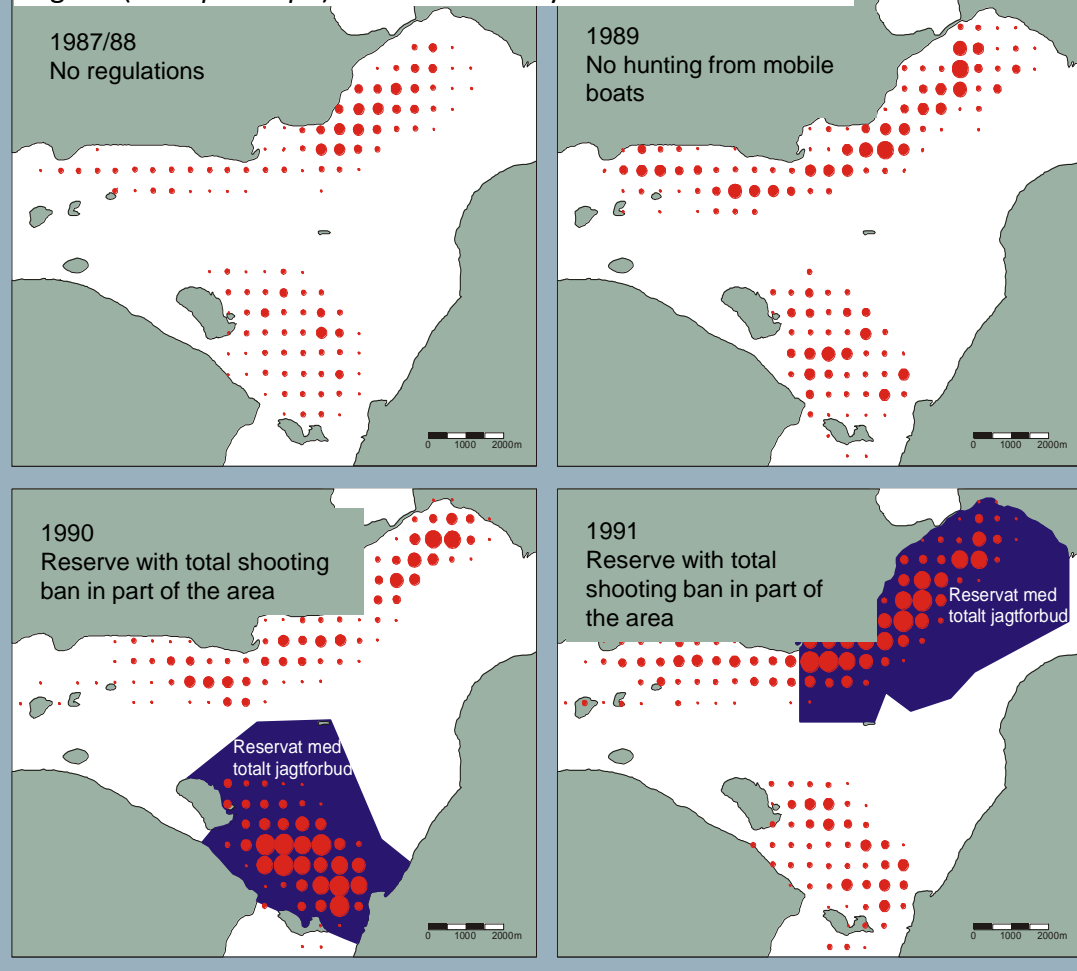
Madsen, J. 1998 *J. Appl. Ecol.*

Reserve experiments Nibe-Gjøl Bredninger

- Maximum numbers of Wigeon at Nibe-Gjøl Bredninger rose from 5,000 annually (1985-88) to 25,000 (1993)
- Similar distributional responses were found at Ulvshale-Nyord



Reserve experiments in Nibe Bredning. Dots indicate densities of Wigeon (*Anas penelope*) – same scale all years



General conclusions from the Wadden Sea and experimental reserve studies

- The hunting activities, as practised, led to a considerable disturbance of the waterbirds - and reduced or even made it impossible for the birds to feed and rest undisturbed in the areas before reserves were established.
- The bird's use of the experimental reserve areas had been held well under the carrying capacity of the sites before reserves were established.
- Hunting activities **as practised in the areas were unsustainable.**
- Establishment of reserves led not only to higher numbers of waterbirds – **but also better hunting opportunities in the surrounding areas.**
- A WIN-WIN SCENARIO

