



climate changes scenario spatial planning

Claire Vos, Marijke Vonk & Dirk-Jan van der Hoek

**Building adaptive capacity for wetlands
when competition for land is high**

Netherlands Environmental Assessment Agency



WAGENINGEN UR
For quality of life

www.klimaatvoorruijnte.nl

Contents

- Introducing the adaptation concept:
'climate adaptation zones'
- Challenges for implementation



climate changes scenario spatial planning

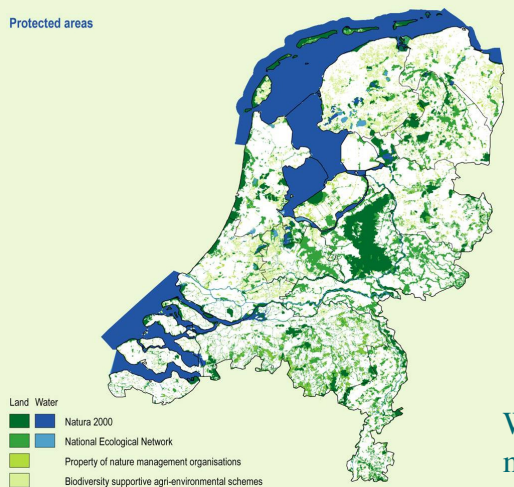
Central question

- How can we increase the adaptive capacity of the national ecological network (NEN) to cope with the effects of climate?



National Ecological Network

Protected areas



The NEN is based on metapopulation theory.

It is a strategy to protect biodiversity in fragmented landscapes where pressure on land use is high.

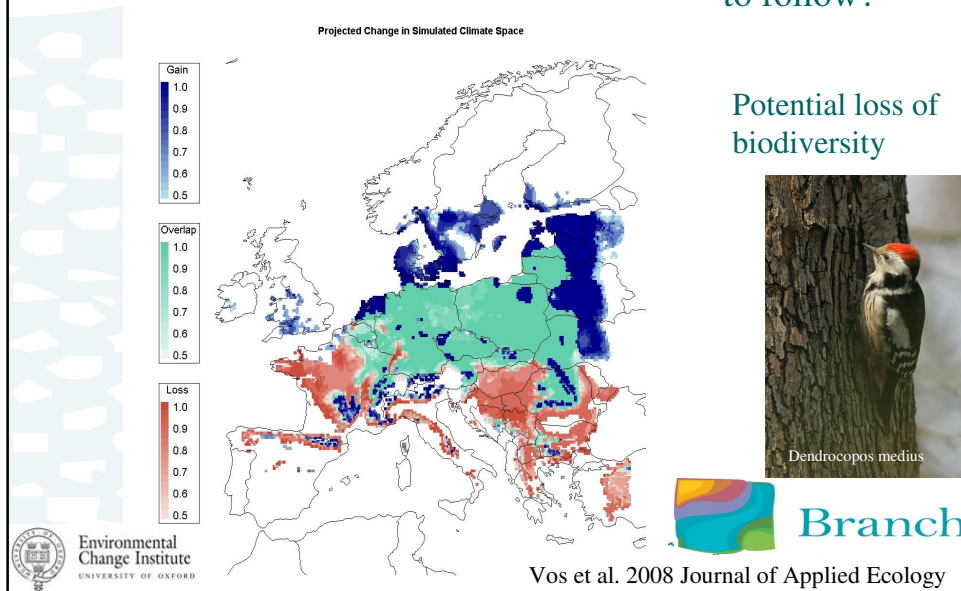
Is adaptation of the NEN to climate change needed?

Where are adaptation measures most effective?

Predicted Range shifts

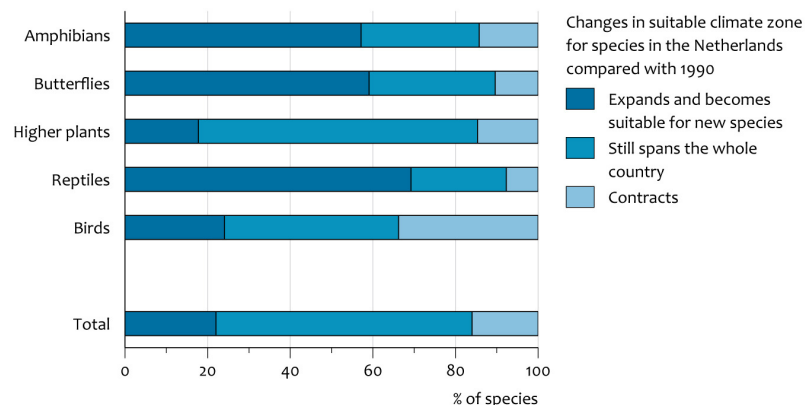
But will species be able to follow?

Potential loss of biodiversity



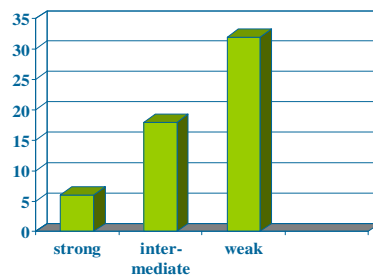
Predicted range shifts

Changes in suitable climate zones, 2100



Impacts of weather extremes

- Results in larger fluctuations of populations: increase of extinction risk
- Recovery is slower in fragmented networks



Foppen et al. 1999

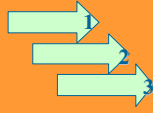
Adaptation strategy

1 Increase connectivity by enlarging areas and linking networks

2 Increase heterogeneity within nature areas and the surrounding landscape

3 Improve abiotic conditions facilitate natural processes

Combine measures in a Climate Adaptation Zone



1. A zone where adaptation measures are spatially concentrated to increase the adaptive capacity of the NEN.
2. A zone where activities are avoided that have a negative impact on the functioning of the NEN.

Spatial planning Climate Adaptation Zone for wetlands

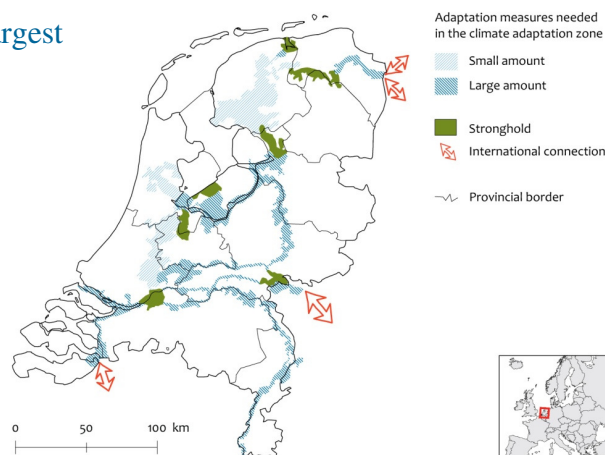
Identify strongholds: largest existing wetlands

Embed the strongholds in a climate corridor

High density of existing wetlands

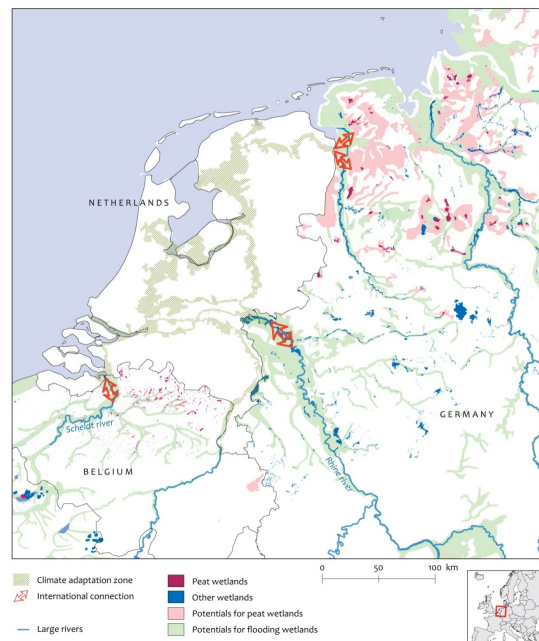
Low density of spatial bottlenecks

High abiotic potentials for wetland restoration



To facilitate range expansion connectivity is required over large distances

International cooperation to link networks



Identify where large scale connectivity is required

Main corridor

Potential main
corridor

Side branch

Example of main European Climate Adaptation Zones for forests

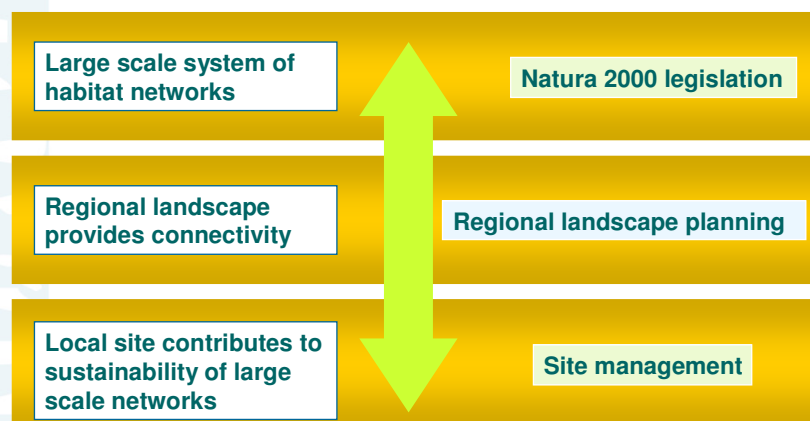


Vos & van Eupen 2010 unpubl.

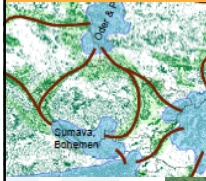
Challenges for implementation

- **How to realize enough connectivity in the right place (consistent over large scale)**
- **by stimulating connectivity in local landscape change initiatives**

Three levels of scale: ecological & political



Regional landscape planning



EU nature conservation legislation

Natura 2000 Reserve

Natura 2000 Reserve

Natura 2000 Reserve

Regional landscape planning

Green Infrastructure as an instrument to develop or retain connectivity

Regional stakeholders need to be aware of their role on a larger scale level

climate changes spatial planning

Green infrastructure: physical basis for landscape services



Natural pest control



Visual quality



Water retention



Water en air purification

Termorshuizen & Opdam Landsc Ecol 2009

Find synergy between nature and other landuse functions

- recreation
- regulated flooding areas
- water retention areas



English report available at:

<http://www.pbl.nl/en/publications/2010/>

Thank you