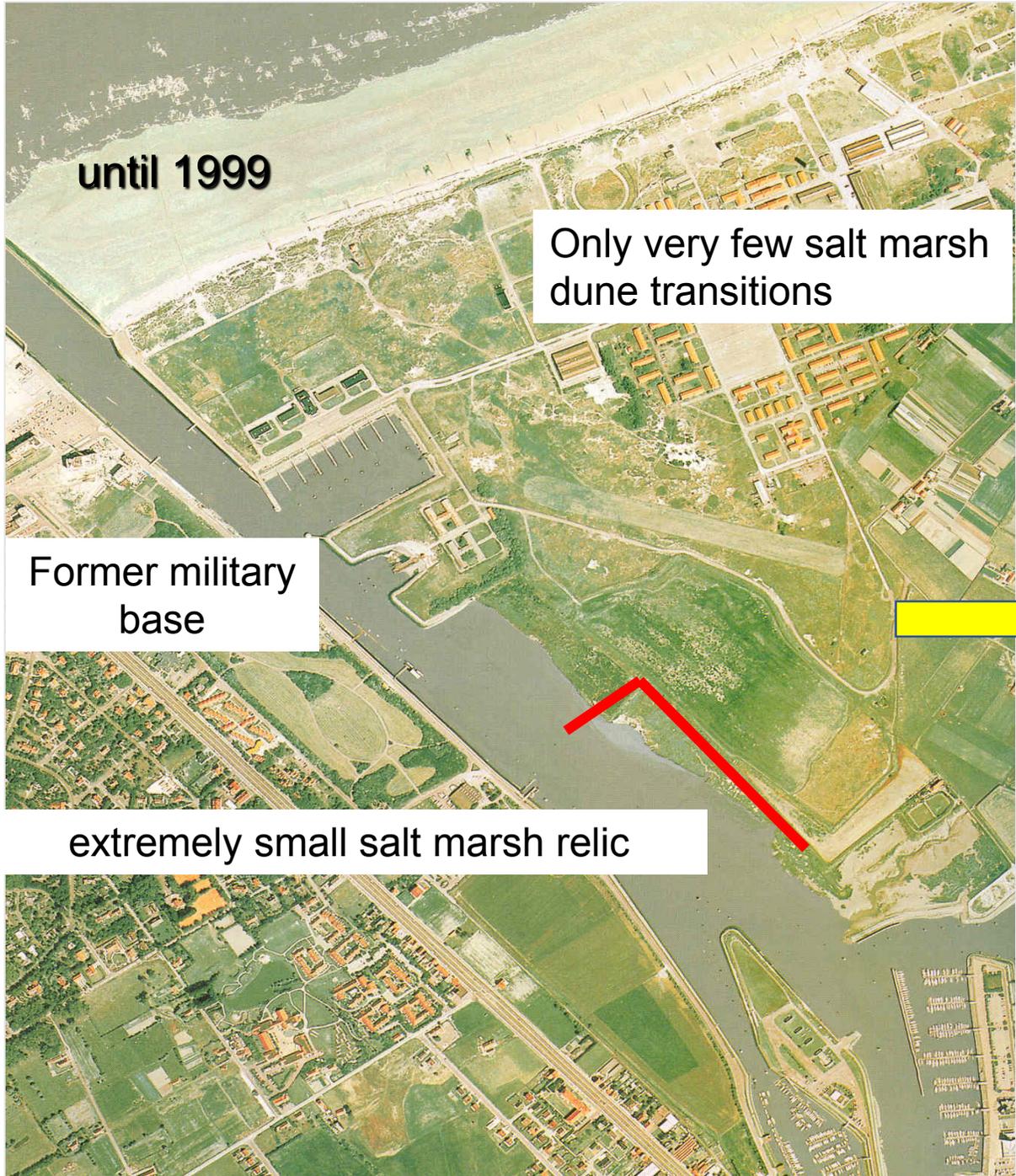




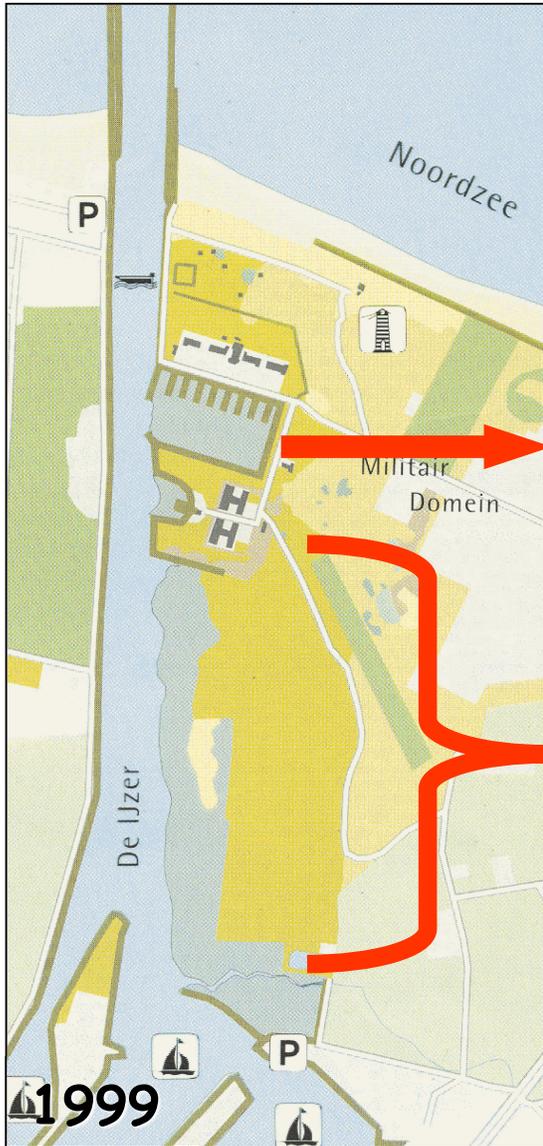
Colonization of threatened spiders and carabids in the recently created dunes and salt marshes of the Yzer estuary

Wouter DEKONINCK, Frederik HENDRICKX
& Léon BAERT



Newly created dunes and salt marshes

sandy cover
on strip of former
naval command buildings



**buildings, hangars
and naval dock
removed**

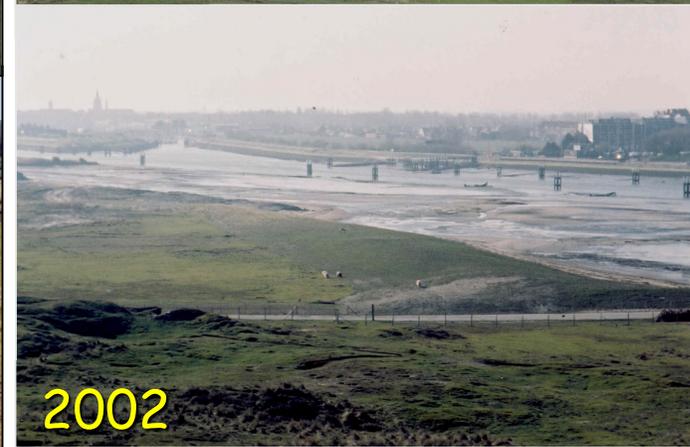
**large area of
deposited dredged
material removed
to tidal level**



Creation of new salt marsh : large area of deposited dredged material
500.000m³ removed to tidal level



Result of Nature restoration project were impressive





Sampling spiders and carabids since 1989 until 2014

- Pitfall trapping
- Year-round sampling : 146 site-year-cycles sampled
- A total of 149.868 spider and 140.429 carabid specimens
- A total of 247 spider and 139 carabid species

- Sampling before and after restoration

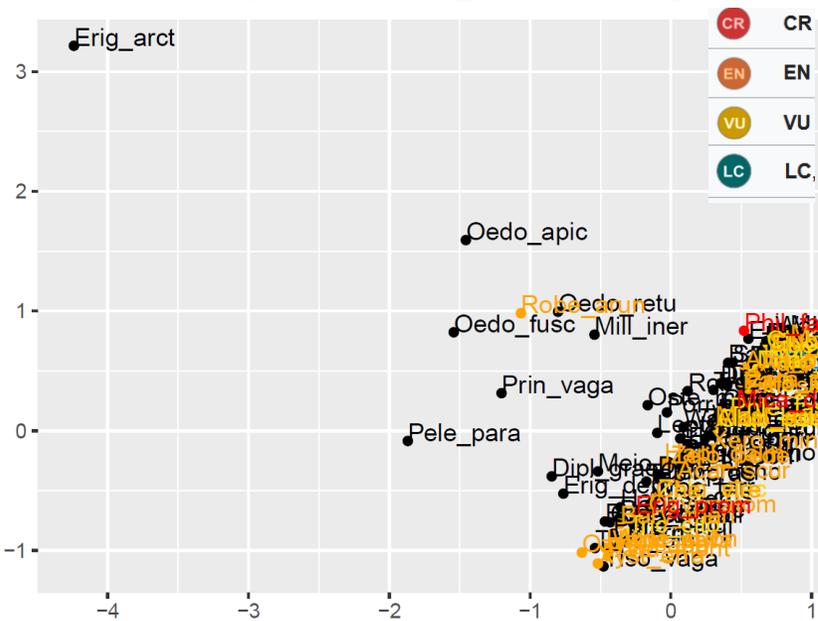
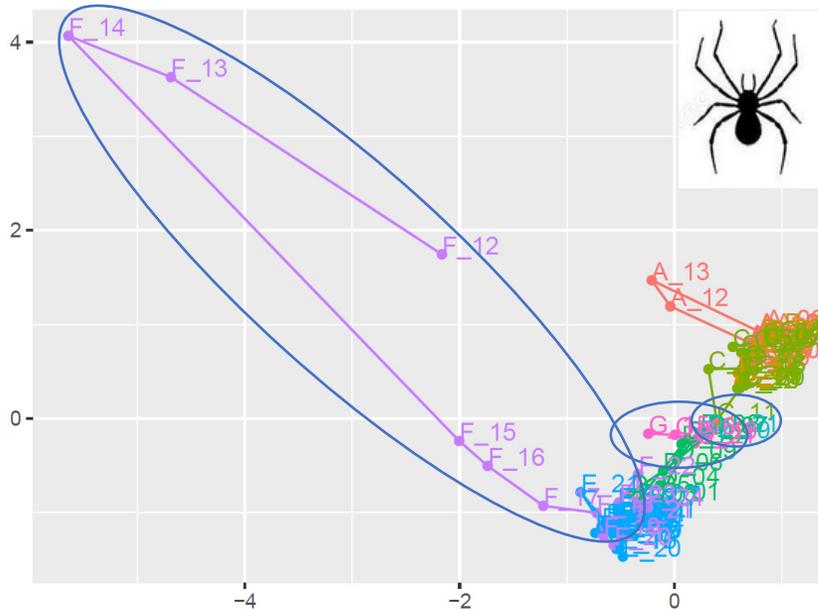
Two main habitat types: dry sandy habitats + salt marshes

Community analyses multivariate analyses : ordination

Basic data: total number of individuals/species/sampling station/year-cycle



Colonisation of new dry, sandy habitats by spiders : FIRST COLONISATION

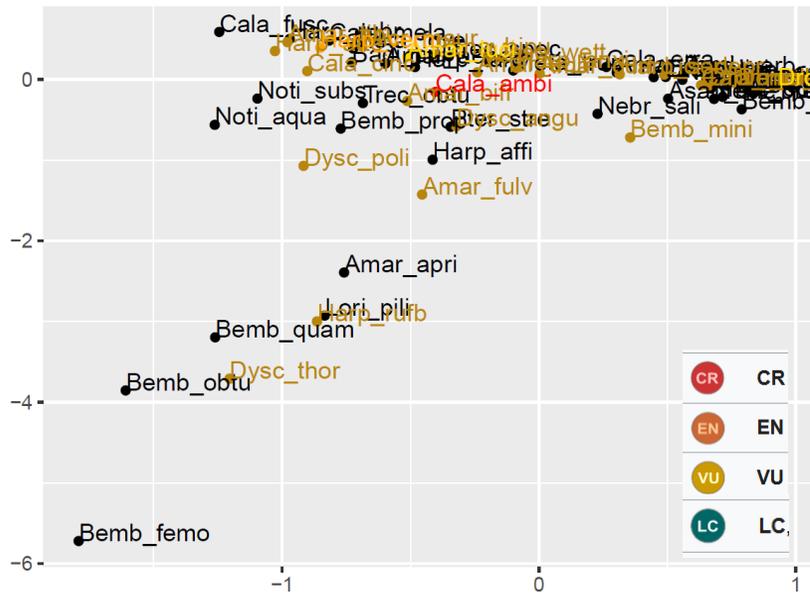
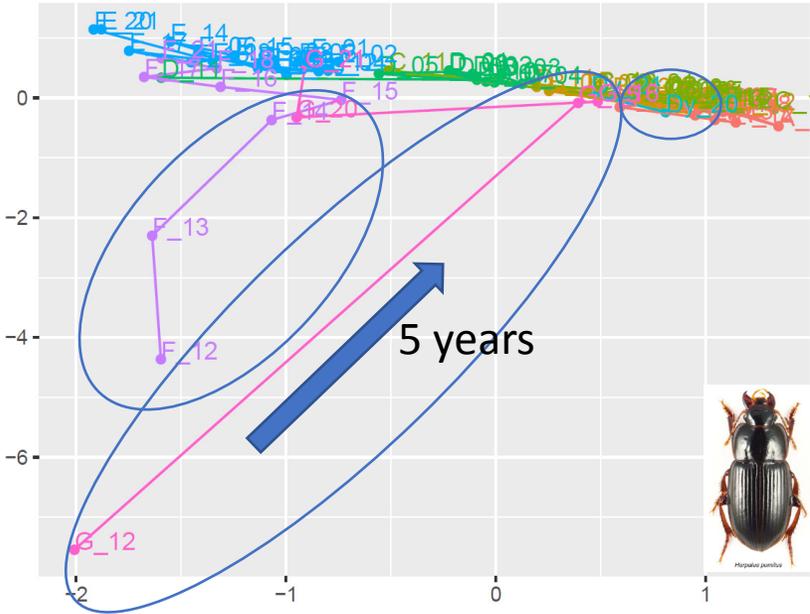


PLOT F



- Restored dune habitats quite different from natural dunes despite all are at first sight open sandy habitats
- > 7 years before similar to dune grassland
- Specific fauna of new habitats => pioneer species

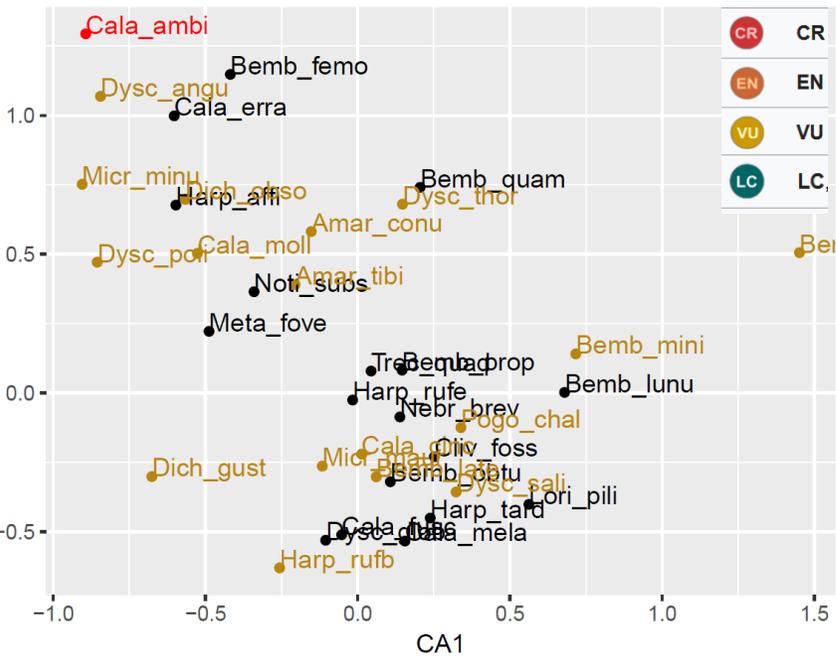
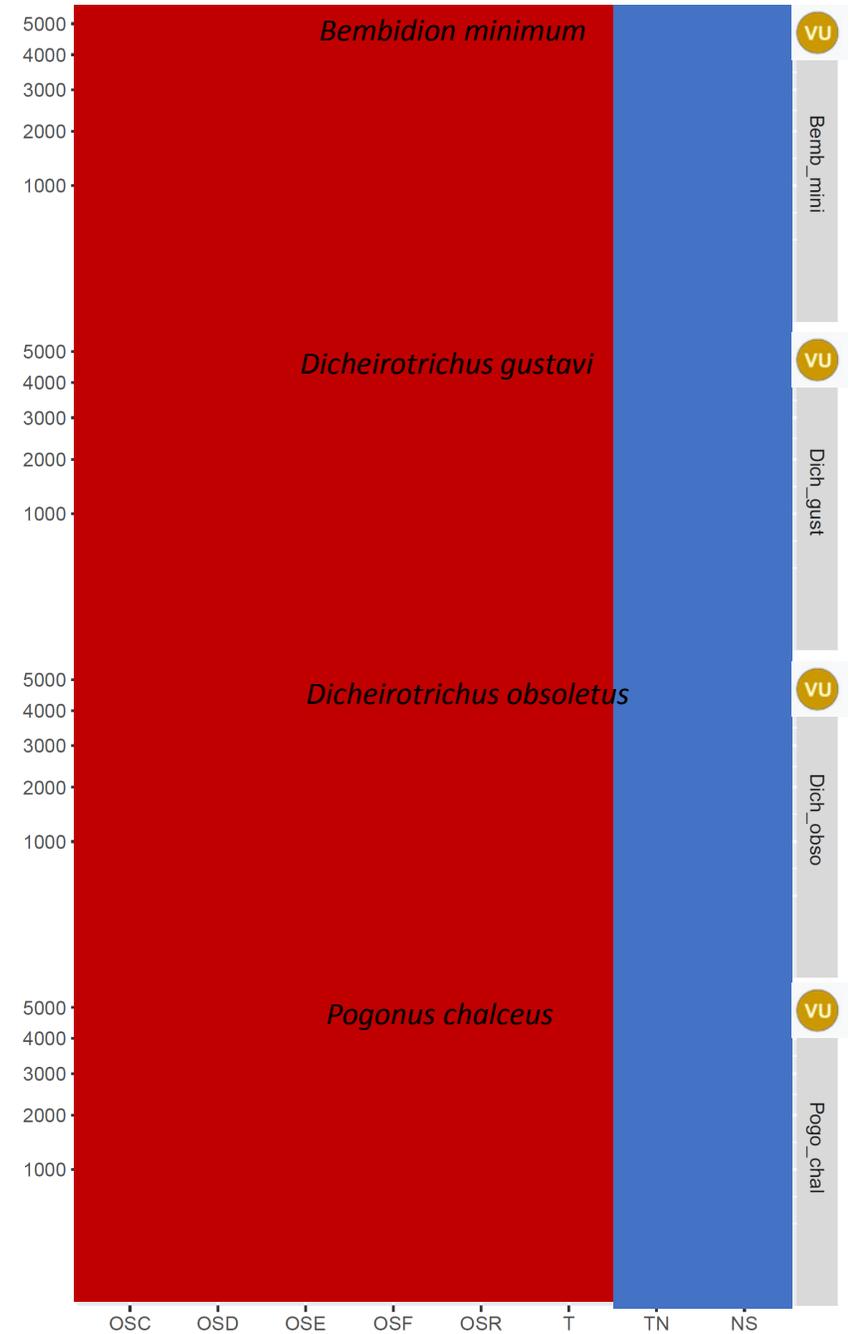
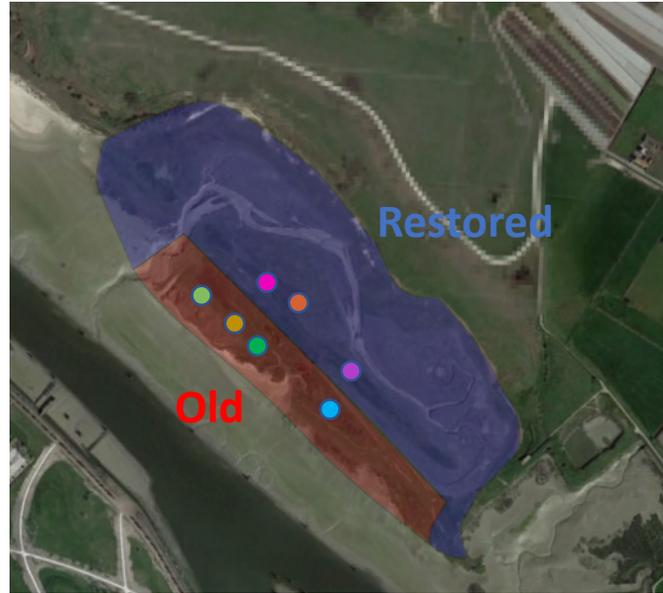
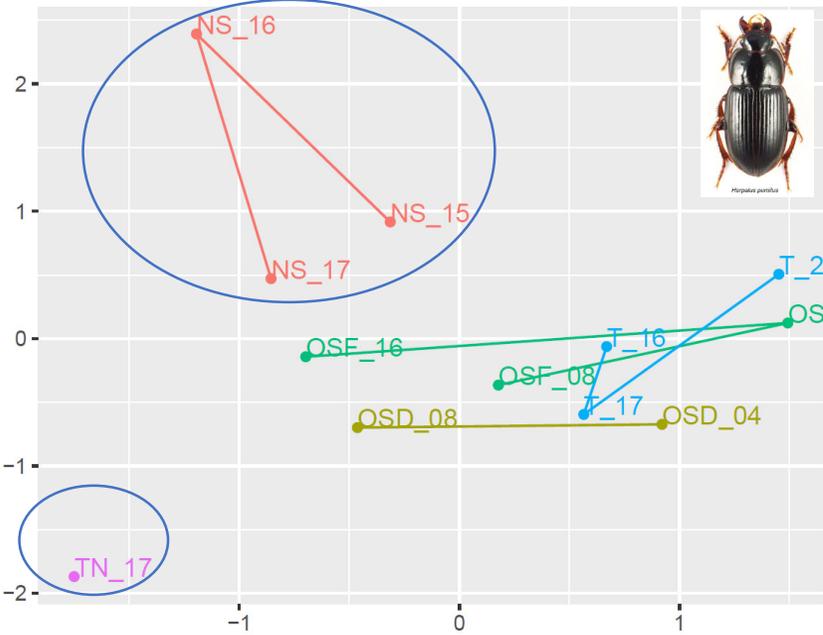
Colonisation of new dry, sandy habitats by carabids : FIRST COLONISATION



The same pattern was observed for the colonisation of the carabid beetles from old to new dry sandy habitats. Here, site G another dike, that was planted with marram, as well as again the other new dike F show the same patterns as for spiders

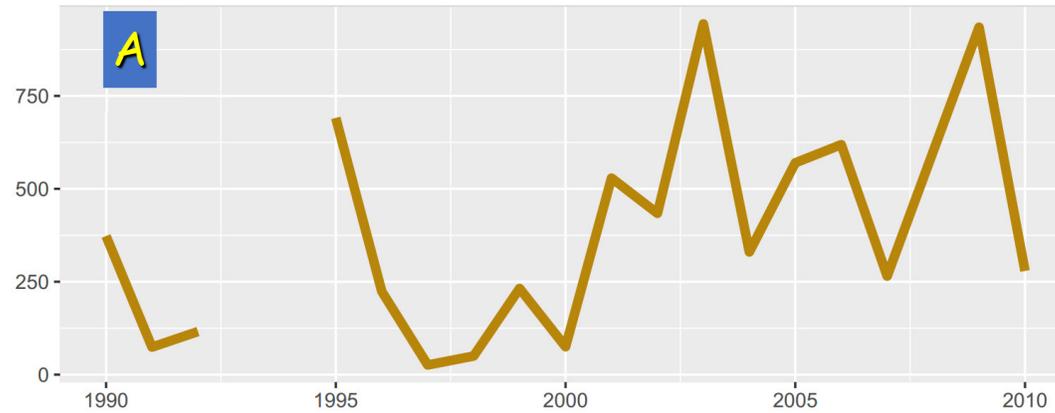


Colonisation of new salt marshes by carabids



- Restored salt marshes quite different from old salt marshes despite vegetation was soon were similar
- Specific fauna of new habitats => also red list species characteristic for salt marshes, however variable

Yearly site to site and species to species fluctuations was clear from long-term monitoring



PLOT A



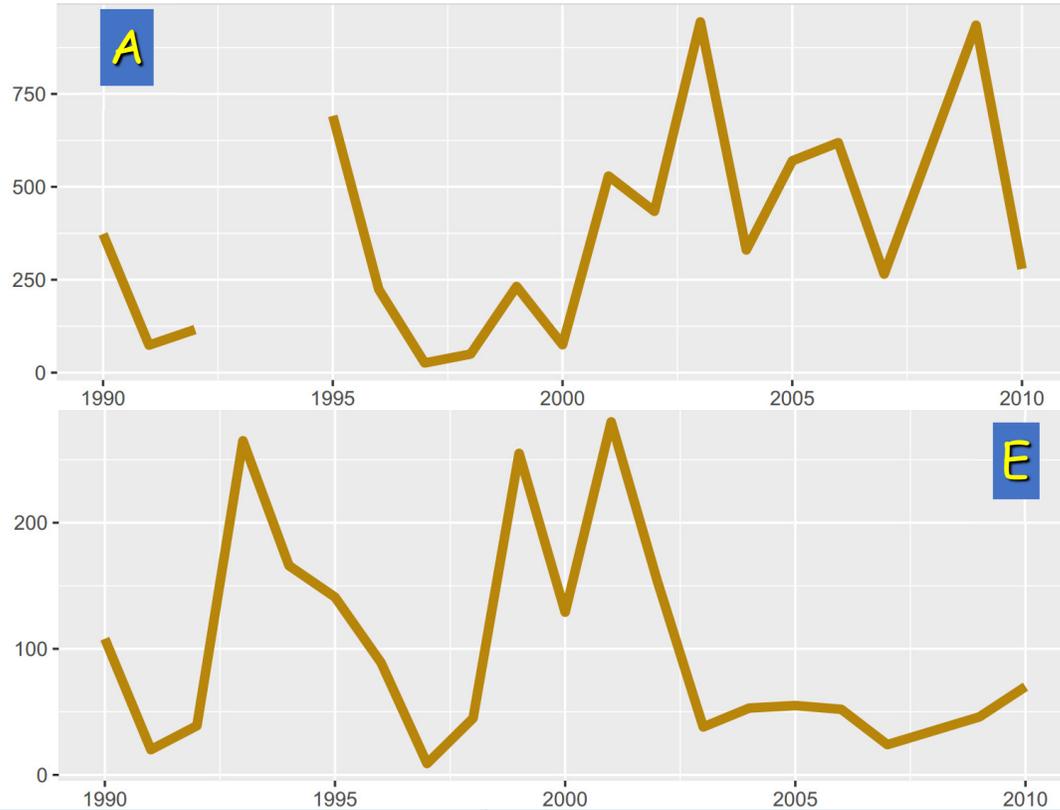
first dune
ridge =
marram
dune

Yearly fluctuations of abundances of a carabid species typical for marram dunes

Some years nearly 1.000 specimens collected

Other years almost no specimens in the marram dunes

Yearly site to site and species to species fluctuations was clear from long-term monitoring



PLOT A



first dune ridge = marram dune

PLOT E



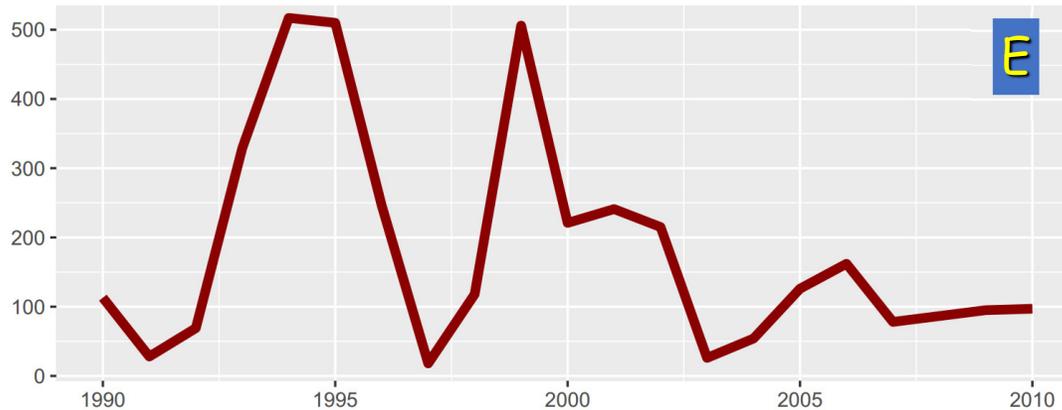
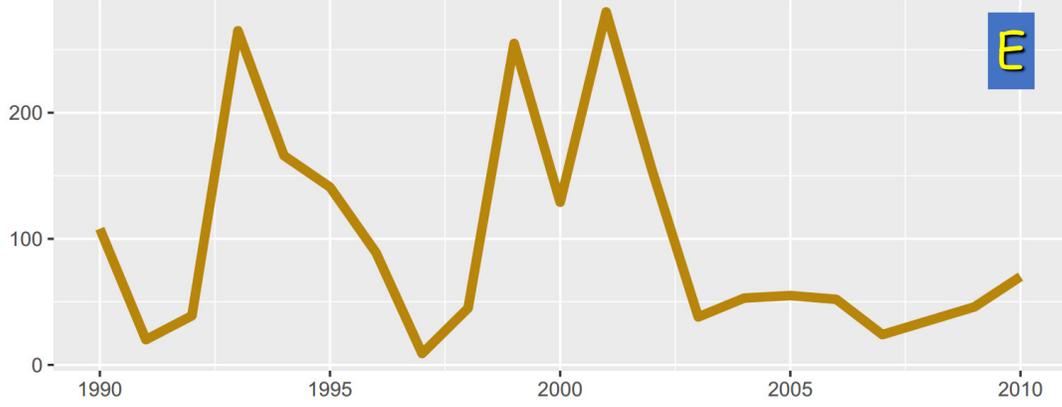
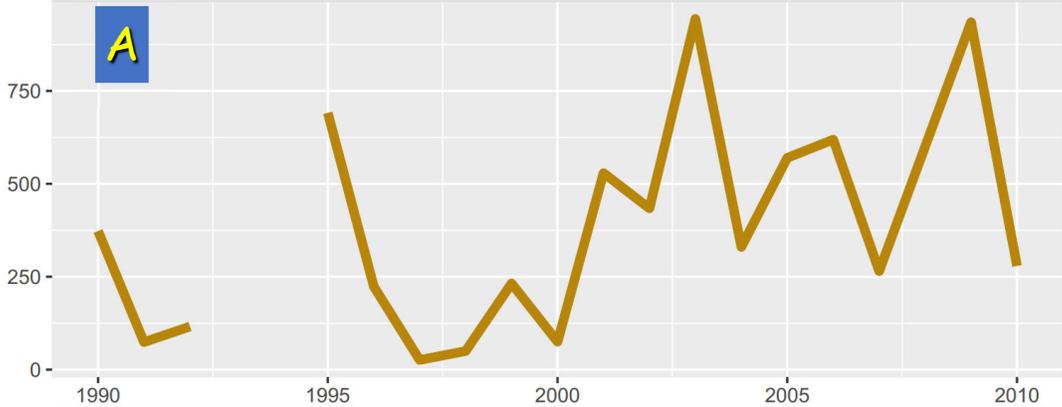
moss dune & dune grassland



Suggests that fluctuations are due to patch specific population dynamics rather than climatic differences between years

Stresses the need for multiple suitable habitat patches to preserve species in the area

Yearly site to site and species to species fluctuations was clear from long-term monitoring



moss
dune &
dune
grassland

Confirmed by observation of similar within-patch fluctuations of closely related species, *Calathus cinctus*

Things to conclude:

- Newly developed sites:
 - Initial colonization by generalist pioneer species
 - Similarity with original fauna after ~ 5 -10 years **for dune habitats**
 - Highly threatened salt marsh spiders still not present in restored **salt marshes**

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 - => **probably less successful in isolated habitats!**

Overall diversity \neq RL diversity

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Overall diversity \neq RL diversity

- **Caution : Yearly site to site and species to species fluctuations was clear from long-term monitoring**

Be careful with interpretation of data from short monitoring or one-shot sampling

We want to thank the early human-entomological
“colonisers” and collaborators of this longterm-
monitoring

Rudy Claus

Jean-Pierre Maelfait

Konjev Desender

Marc Van Kerckvoorde

Lut van Nieuwenhuyse

.....



Calathus ambiguus



Harpalus pumilus



Philorhizus notatus



Calathus mollis