Long-term population developments in typical marshland birds in The Netherlands

Why study birds?

- Top of the food chain, sensitive to environmental changes
- Use the landscape at different scales
- Both aquatic and terrestrial
- Large diversity of species, habitats and life-history traits
- Basic ecology relatively well known
- Easily identified
- Reliably censused, at low costs

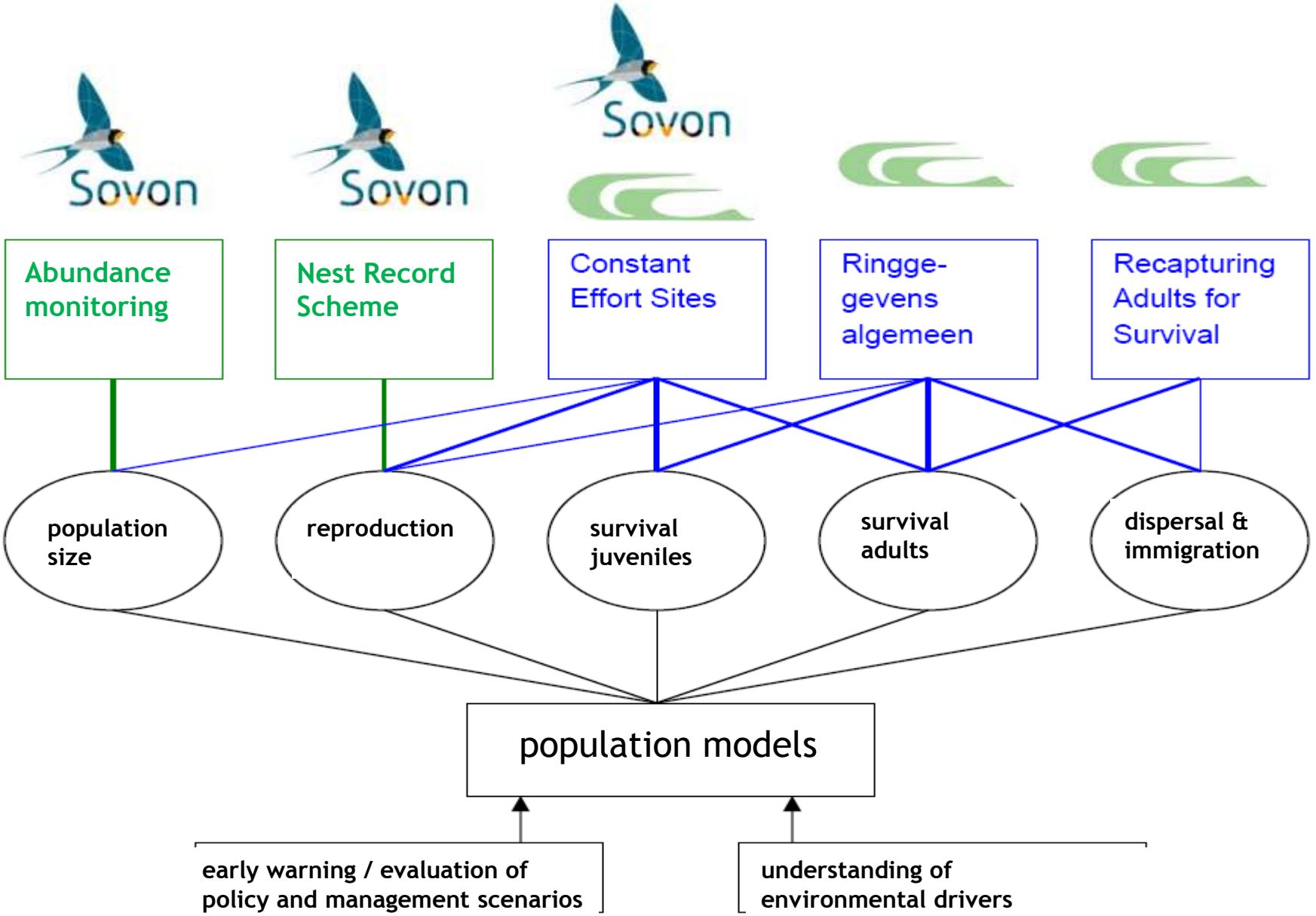
Sensitive and useful indicators of ecological integrity of landscapes and food webs

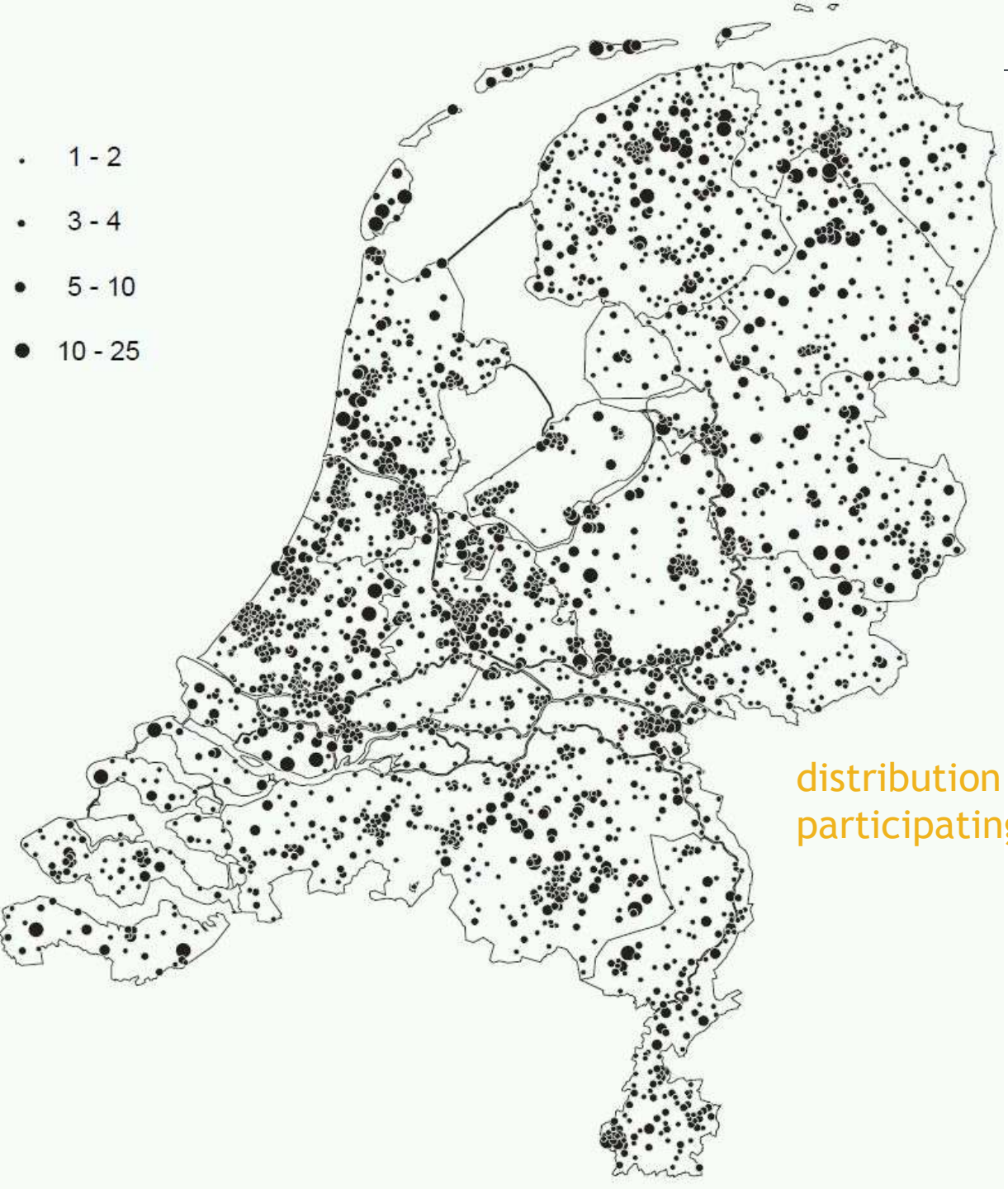
Sovon

SOVON:

- is a non-governmental organization, coordinating the efforts of 7500 volunteer ornithologists
- surveys and monitors bird populations in the Netherlands
- carries out applied scientific research to assess causes of trends

integrated population monitoring (including vital rates)

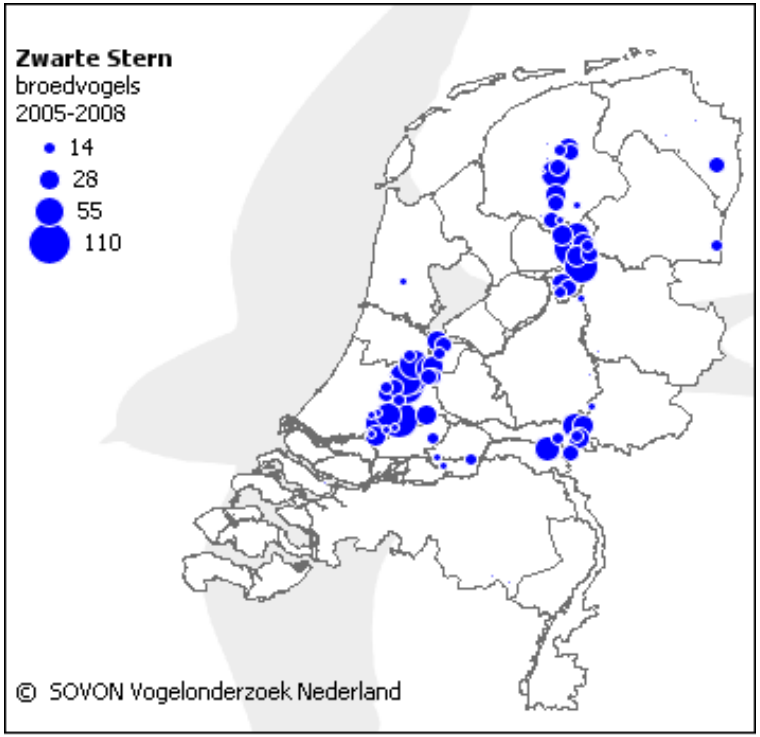


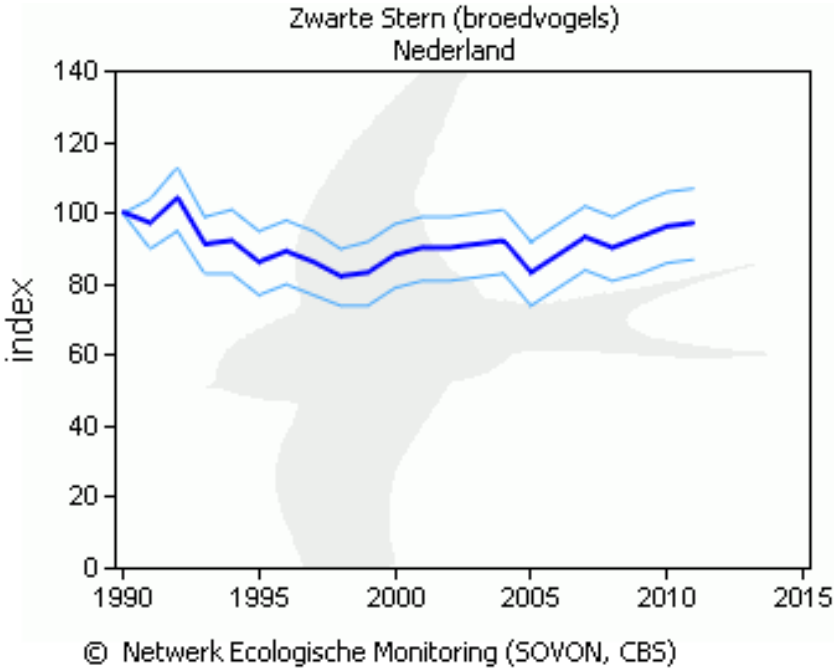


distribution of Sovon-volunteers
participating in monitoring or atlas studies

Sovon

distribution & trends in abundance

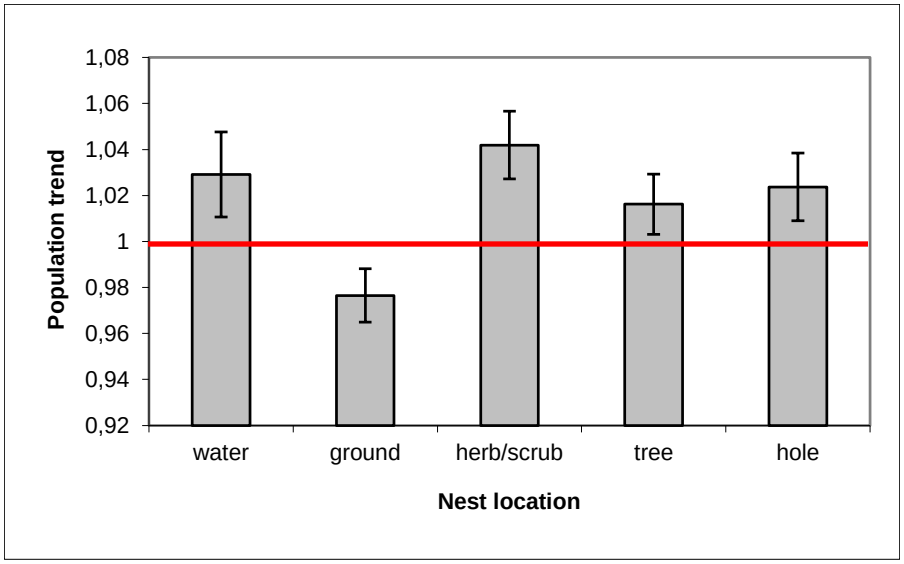




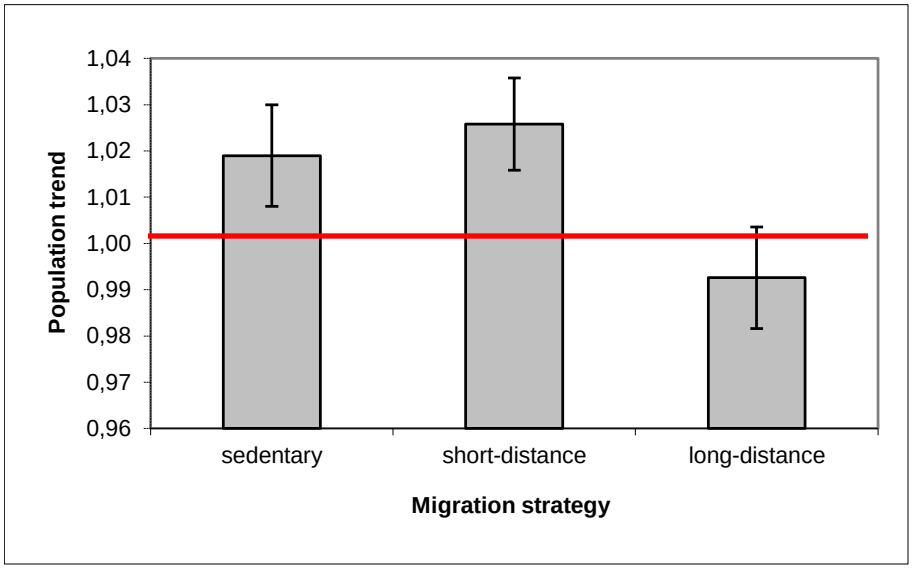
www.sovon.nl/vogelinfo

Sovon

Dutch breeding birds since 1990: which species traits explain national population changes?



- nest location
- migration strategy



Old time series database, period 1950-1984:

- repeated breeding bird surveys

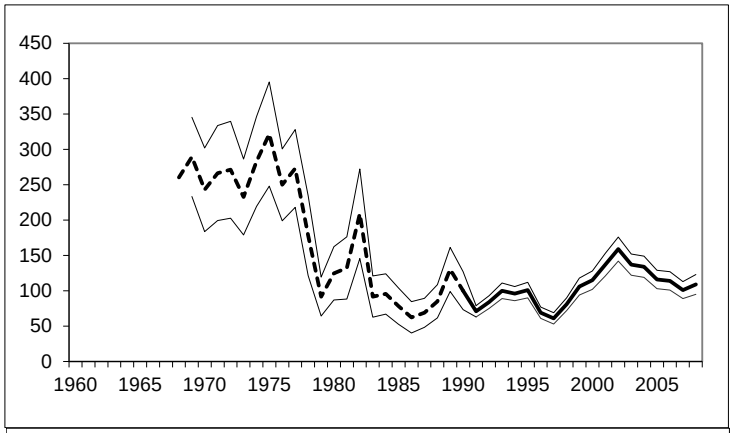
- collected from periodicals, reports, archives, inquiries among individual observers and institutes

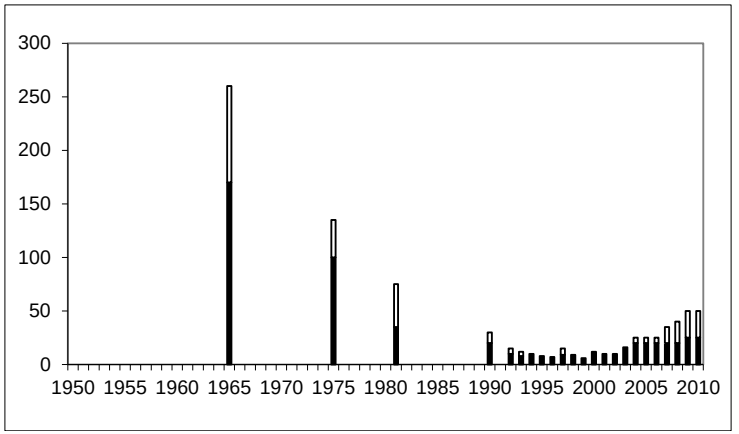
- field work methods comparable within study sites between years

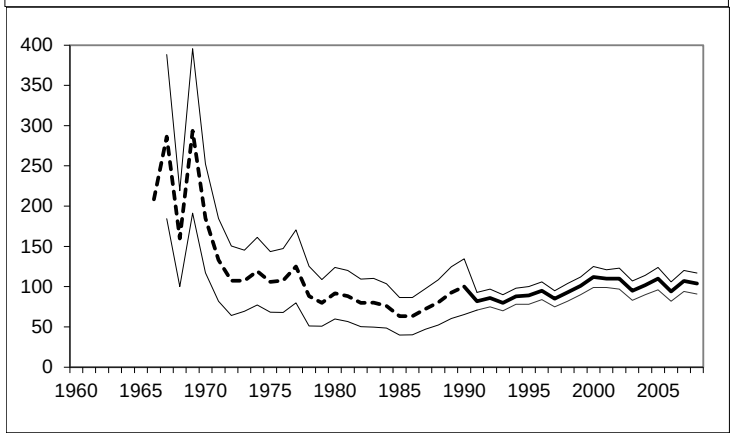
- 2000 study sites, common and scarce species

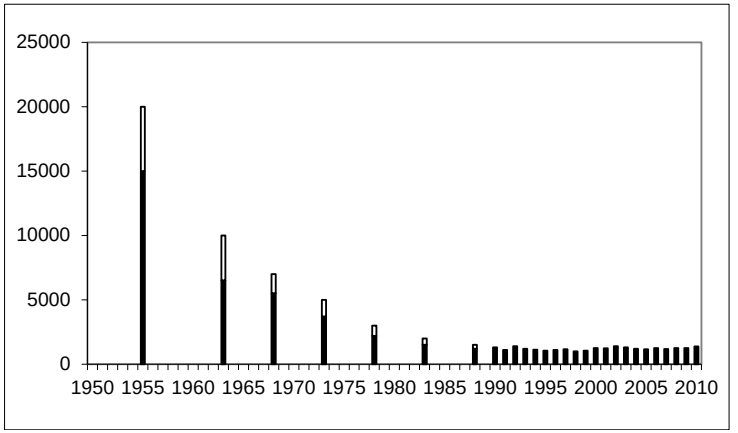
- for rare and colonial breeding species: national population surveys

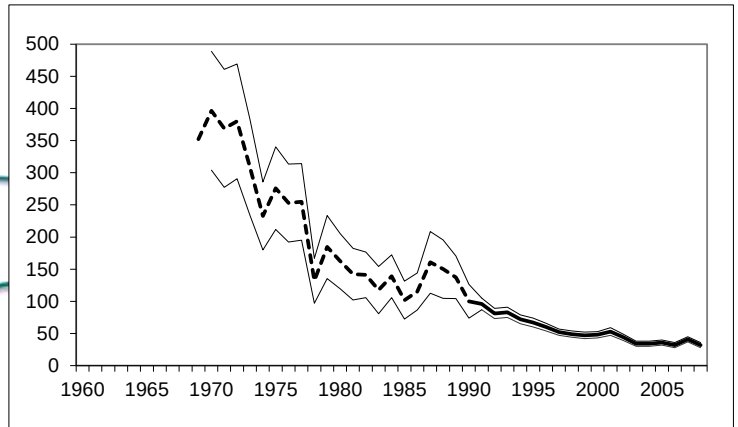
decreases


450
400
350
300
250
200
150
100
50
0
1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

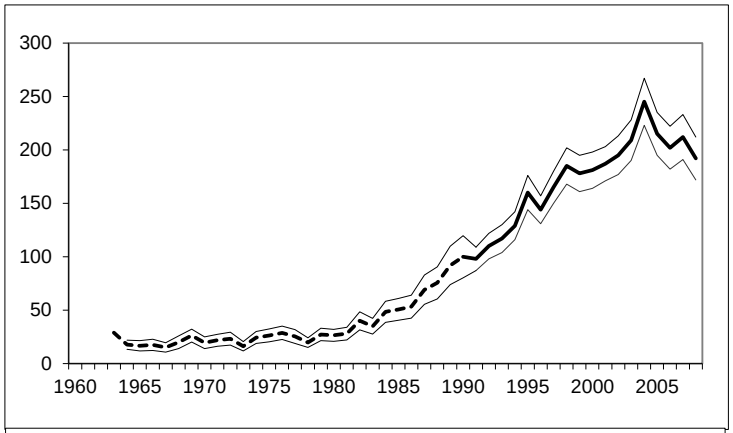

300
250
200
150
100
50
0
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010

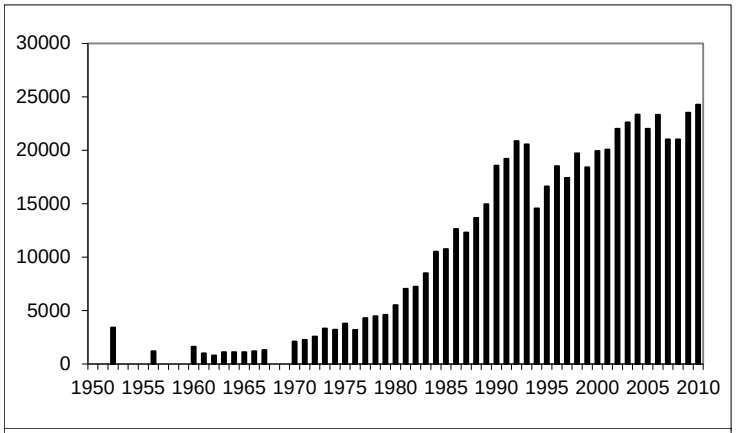

400
350
300
250
200
150
100
50
0
1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

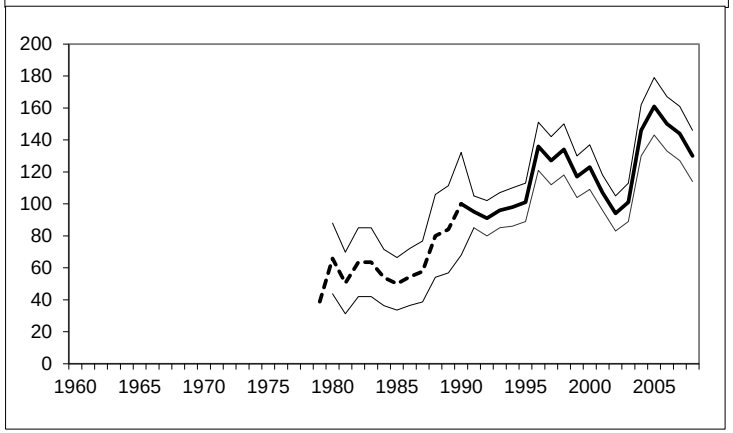

25000
20000
15000
10000
5000
0
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010

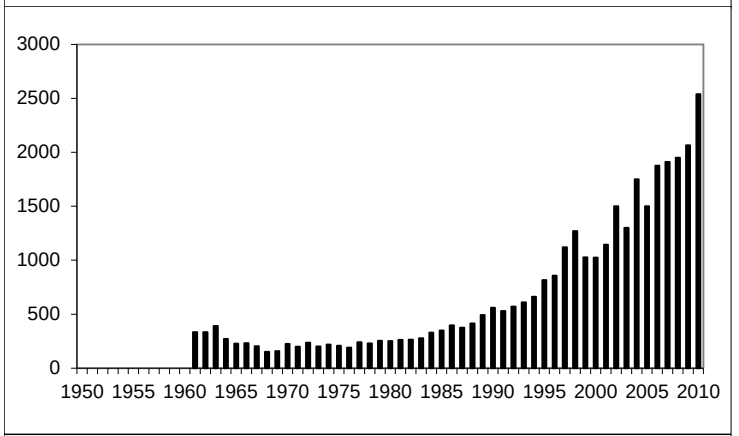

500
450
400
350
300
250
200
150
100
50
0
1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

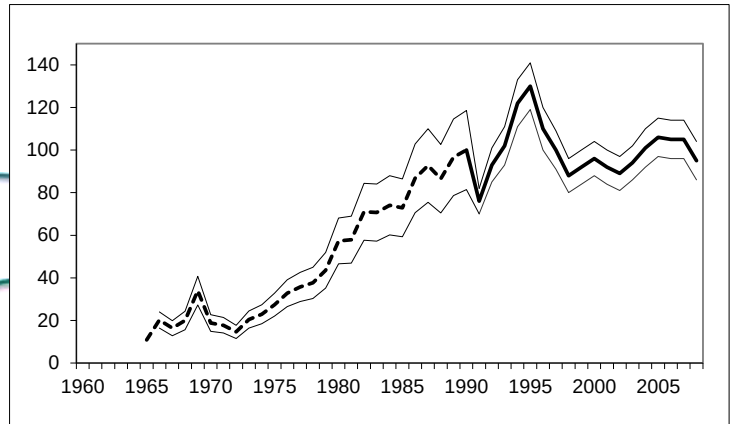
increases

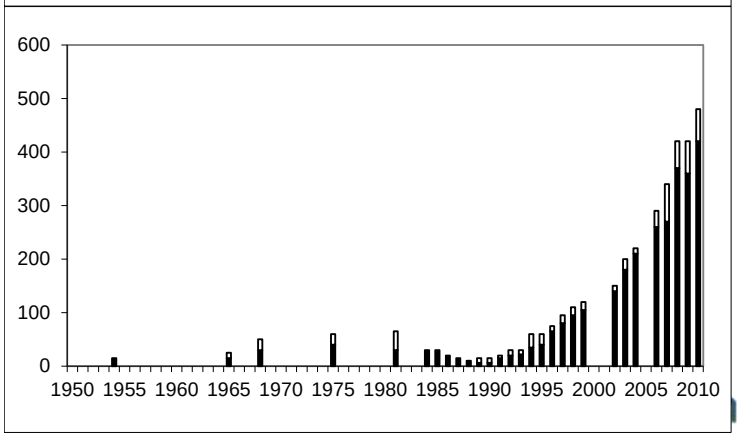

300
250
200
150
100
50
0
1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

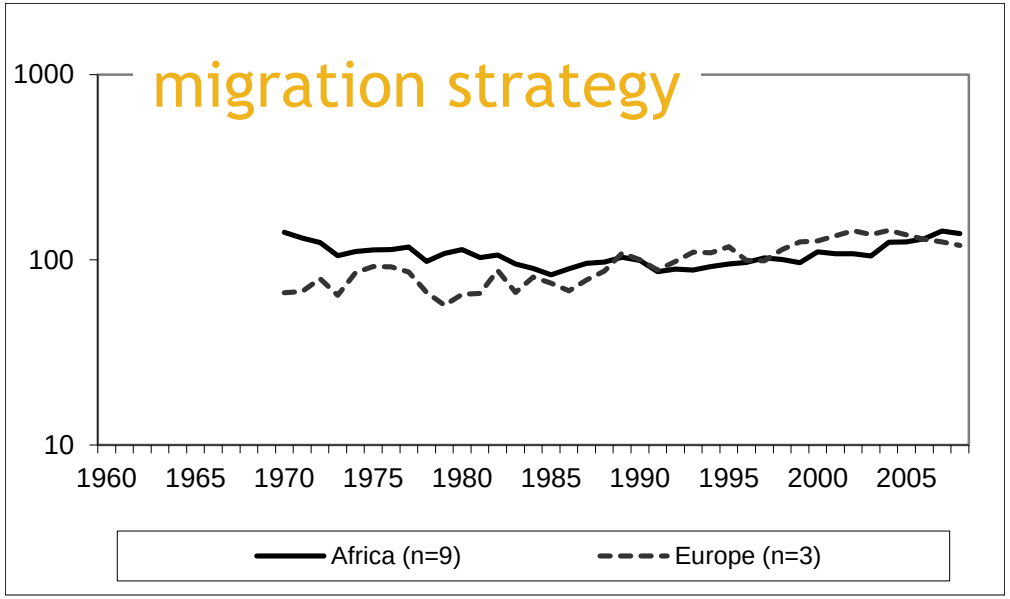

30000
25000
20000
15000
10000
5000
0
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010

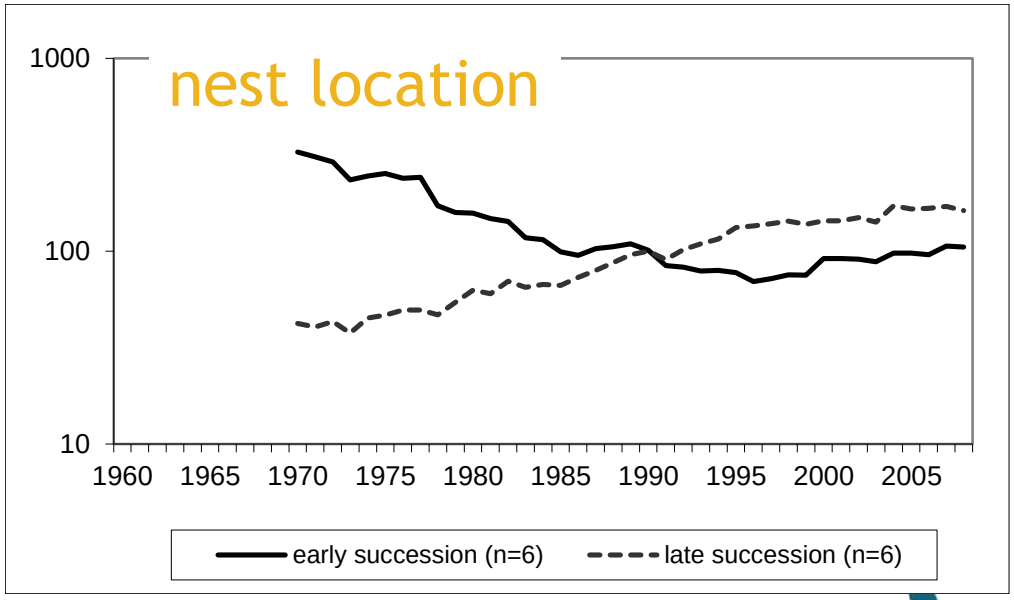

200
180
160
140
120
100
80
60
40
20
0
1960 1965 1970 1975 1980 1985 1990 1995 2000 2005


3000
2500
2000
1500
1000
500
0
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010


140
120
100
80
60
40
20
0
1960 1965 1970 1975 1980 1985 1990 1995 2000 2005


600
500
400
300
200
100
0
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010


migration strategy
1000
100
10
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
Africa (n=9)
Europe (n=3)


nest location
1000
100
10
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
early succession (n=6)
late succession (n=6)

- decline of species of early successional stages is supported by observed declines in breeding success (great reed warbler, black tern)

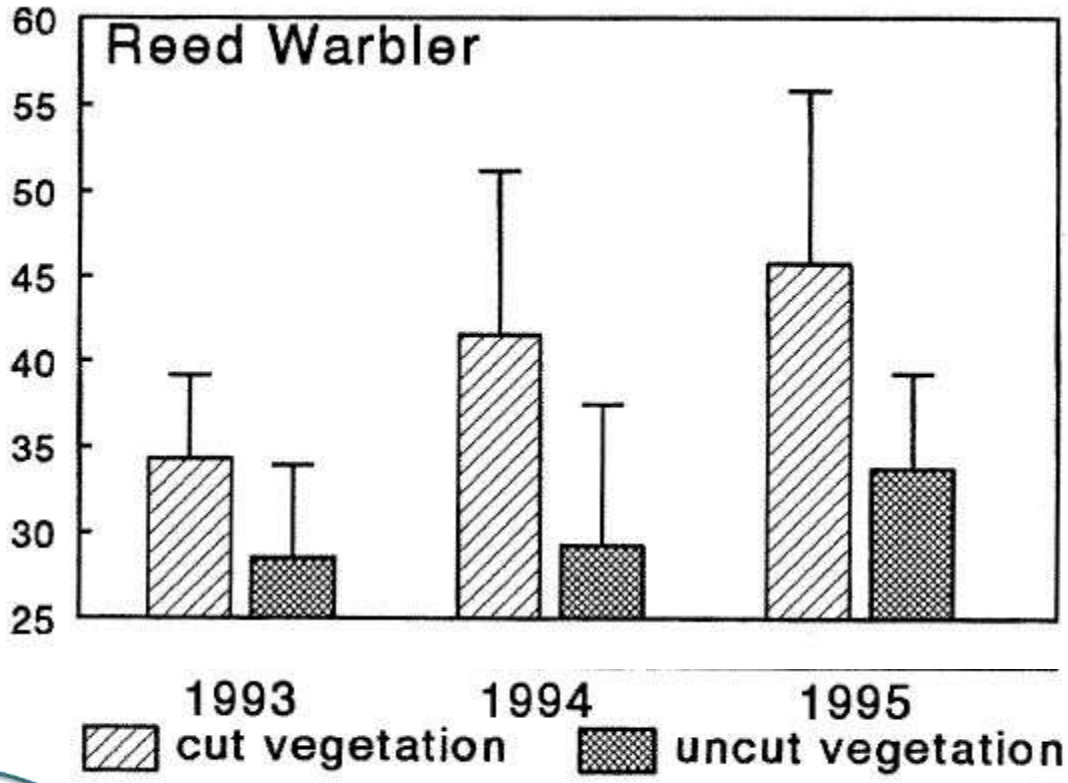
- massive loss of area reedbeds standing over water and floating vegetation

- changes in water table management, falling water tables and eutrophication are main driving forces

Additional drivers (1):

- intensive reed harvesting

timing of nesting in cut and uncut reed beds

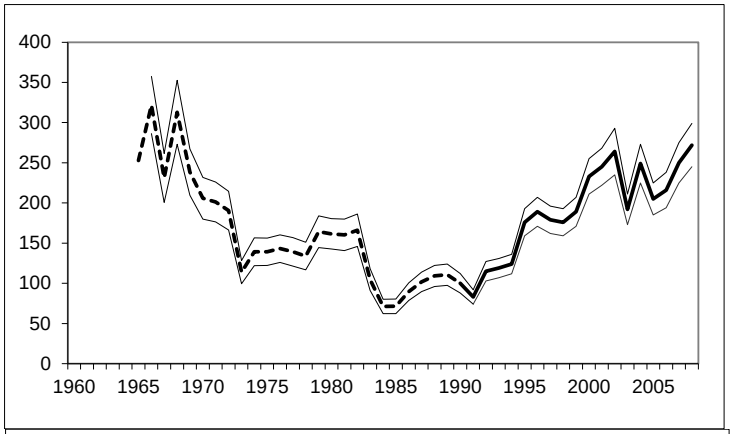


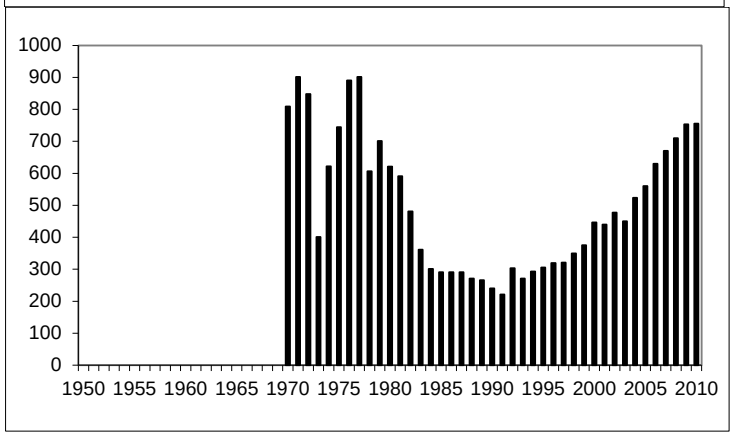
Graveland 1997

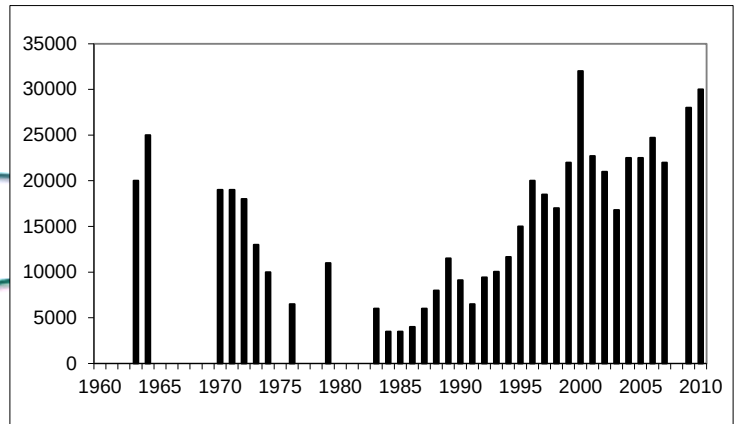
Additional drivers (2):

- periodical droughts in Sahel

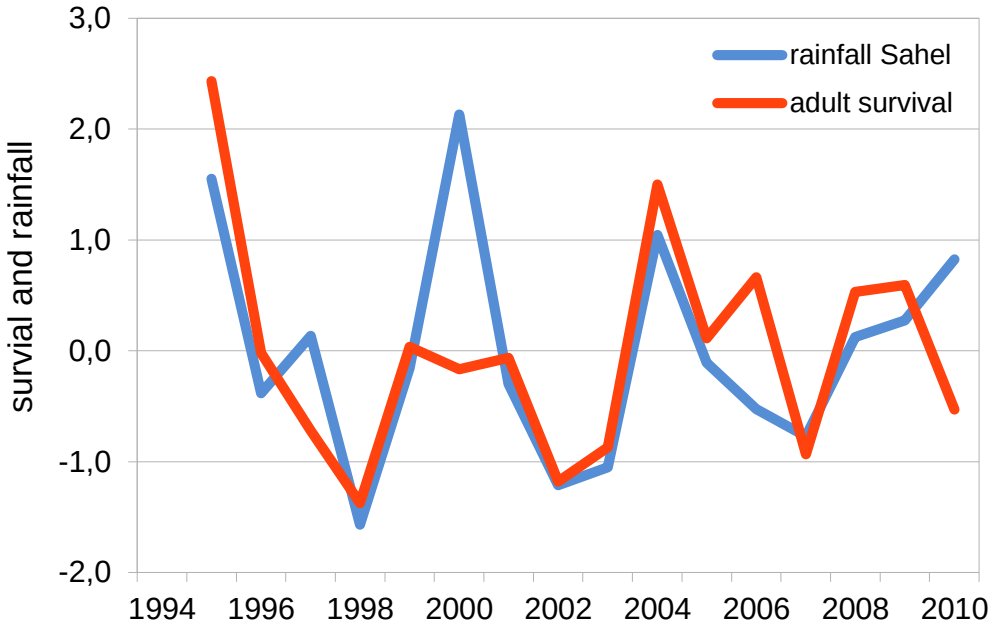
trend reversals







survival from Constant Effort Sites

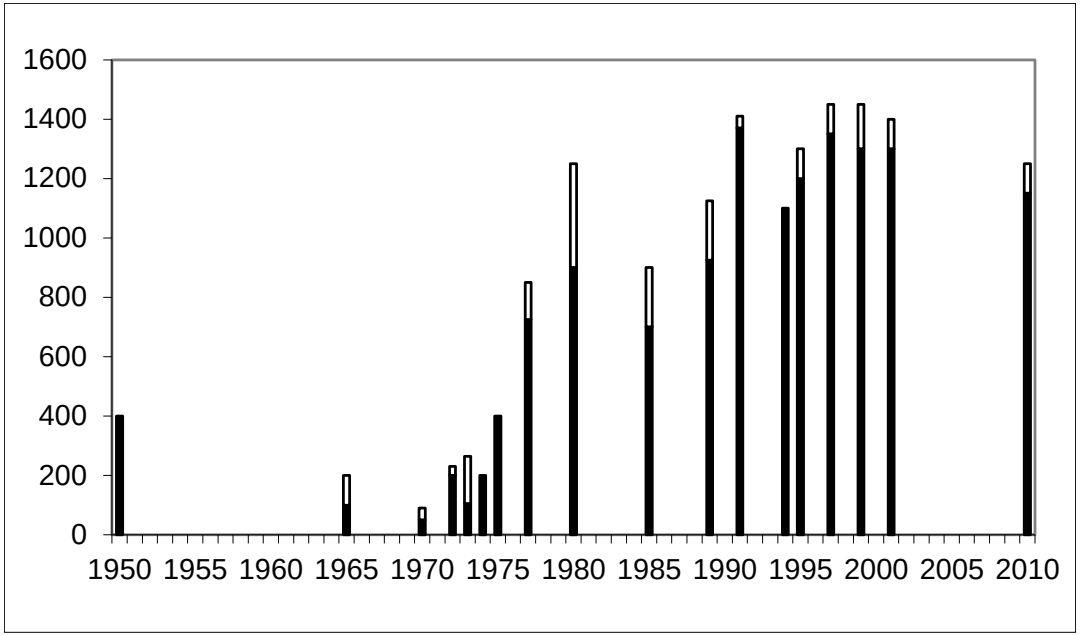


Additional drivers (3):

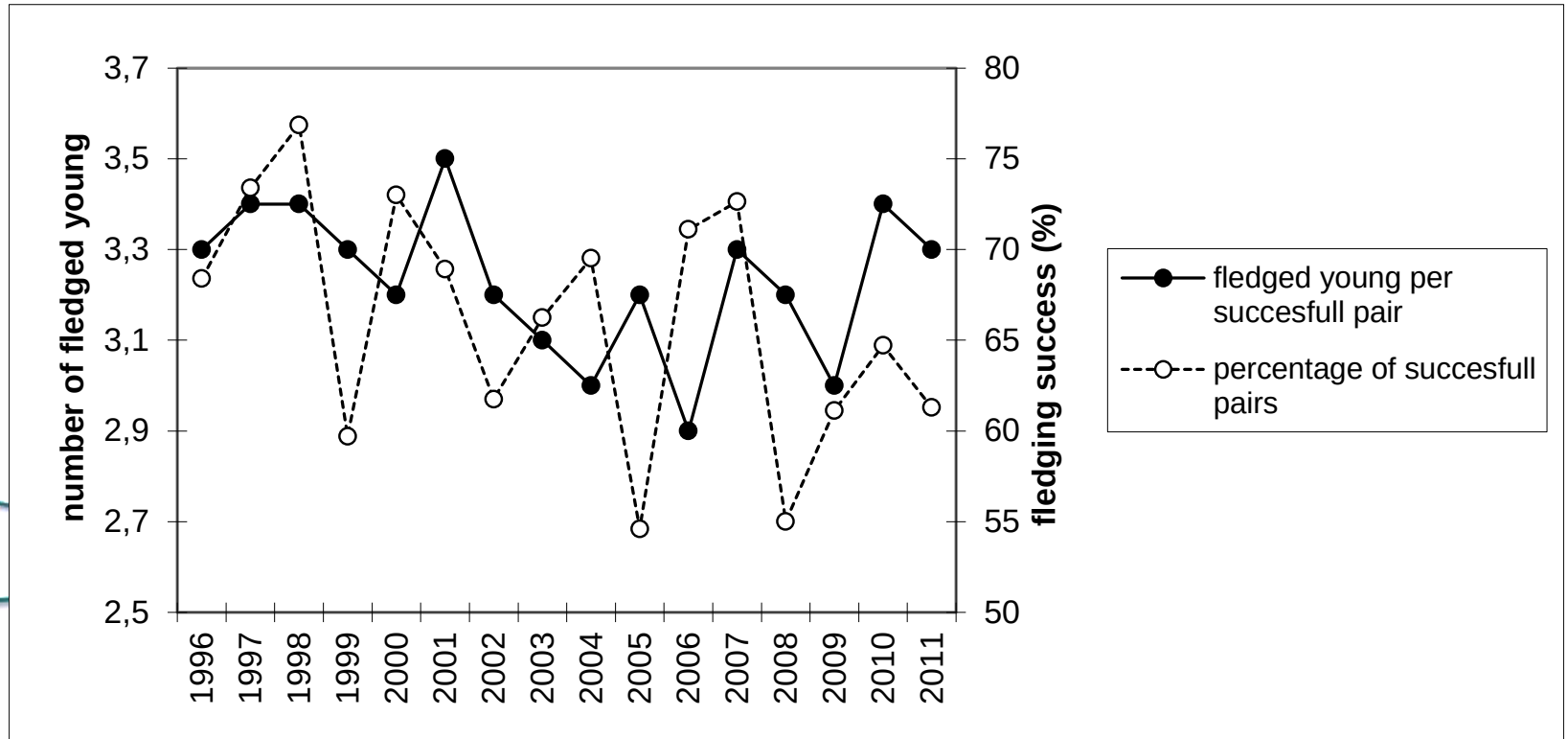
- persecution and pollution

- agricultural intensification

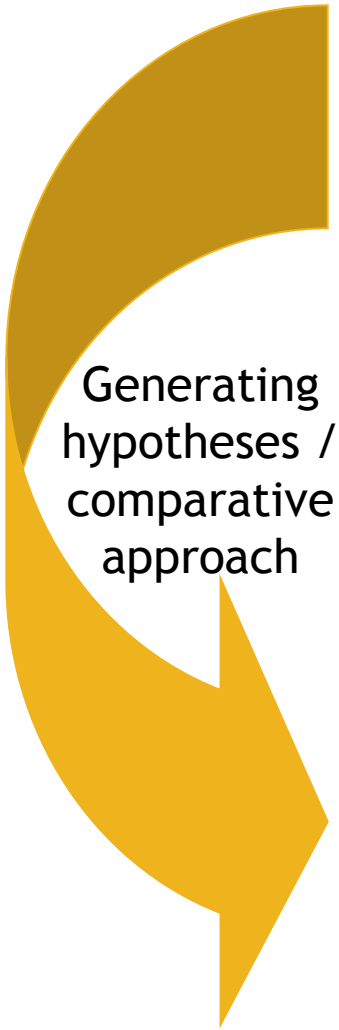
- fragmentation and disturbance


1600
1400
1200
1000
800
600
400
200
0
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010

reproduction from Nest Record Scheme



Value of long-term data sets



Monitoring

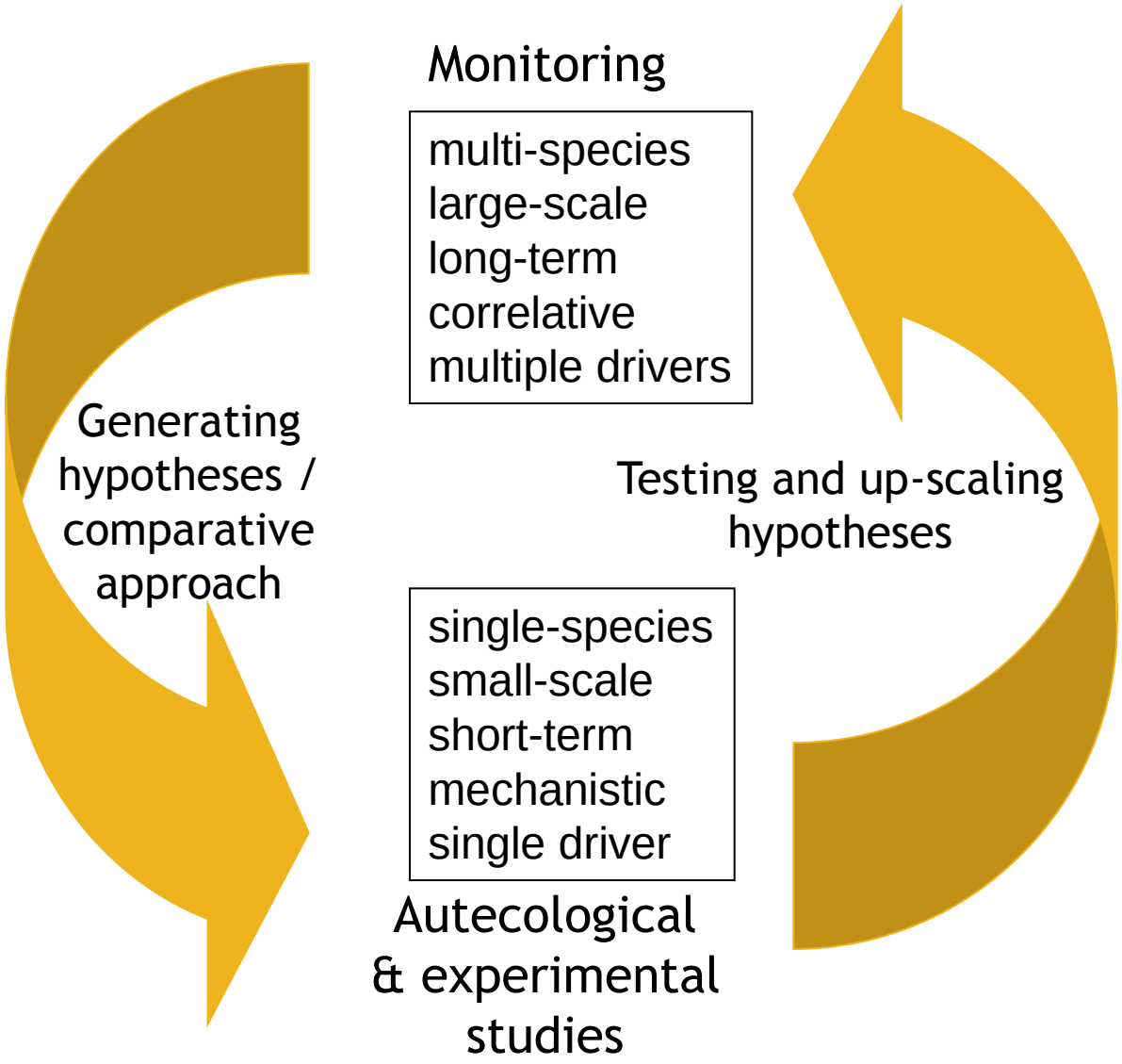
multi-species
large-scale
long-term
correlative
multiple drivers

Generating hypotheses / comparative approach

single-species
small-scale
short-term
mechanistic
single driver

Autecological & experimental studies

Value of long-term data sets



Testing and up-scaling of hypotheses:

- generalize to other spatial or temporal scales
- generalize to other species (sharing similar traits)
- evaluate importance in relation to other mechanisms (‘multiple drivers’)

Stimulate interaction between scientists and volunteer naturalists