

# Designing volunteer based monitoring programs for Natura 2000 species in Flanders



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# Overview

- Introduction
- Identifying and prioritizing monitoring targets
- Designing monitoring networks
- Conclusions

# Introduction

# Introduction

- European Habitat Directive and Bird Directive
  - Aim: protection of habitats and species in Europe
  - Network of protected sites = Natura 2000 network
  - List of protected species under HD and BD  $\approx$  Natura 2000 species



- EU member have to report every 6 years on the conservation status of Natura 2000 species
  - Population
  - Range
  - Habitat of species
  - Future prospects

# Introduction

- Reporting should be based on statistically sound data
  - need for standardized monitoring networks
    - Not specified how to design monitoring networks
    - Harmonization in monitoring approach between members states is encouraged/supported through workshops, conferences (Eurosite, AlterNet, ...)
    - Current harmonization efforts focus on measuring techniques
    - Less attention goes to sample design
      - Number of locations?
      - Number of visits?
      - Monitoring frequency?
      - Sampling technique?

# Introduction

- INBO is responsible for designing and implementing monitoring networks in Flanders
- Data collection will rely on volunteers
  - Practical constraints: many species, many locations, short observation period → data collection by professionals very expensive
  - Benefit from (local) expertise of volunteers
- Challenges
  - How to best meet information needs, given limited resources
  - How to involve volunteers in the design process

# Identifying and prioritizing monitoring targets

# Identifying en prioritizing monitoring targets: systematic approach

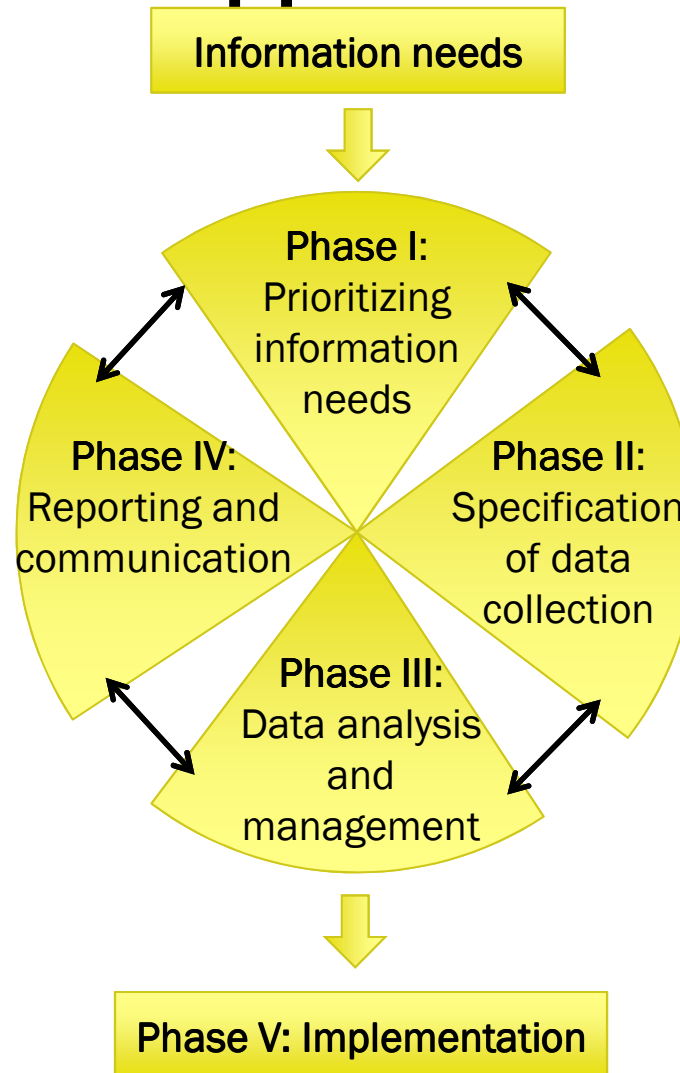
● INBO developed a practical guide for designing monitoring networks

● Both for scientist and policy makers

● 5 phases

● Key points (Evident, but often neglected/ignored...)

- Interaction between designer and client/policy maker
- Clearly define questions/targets
- Prioritize
- Avoid false expectation
- Program >< project monitoring

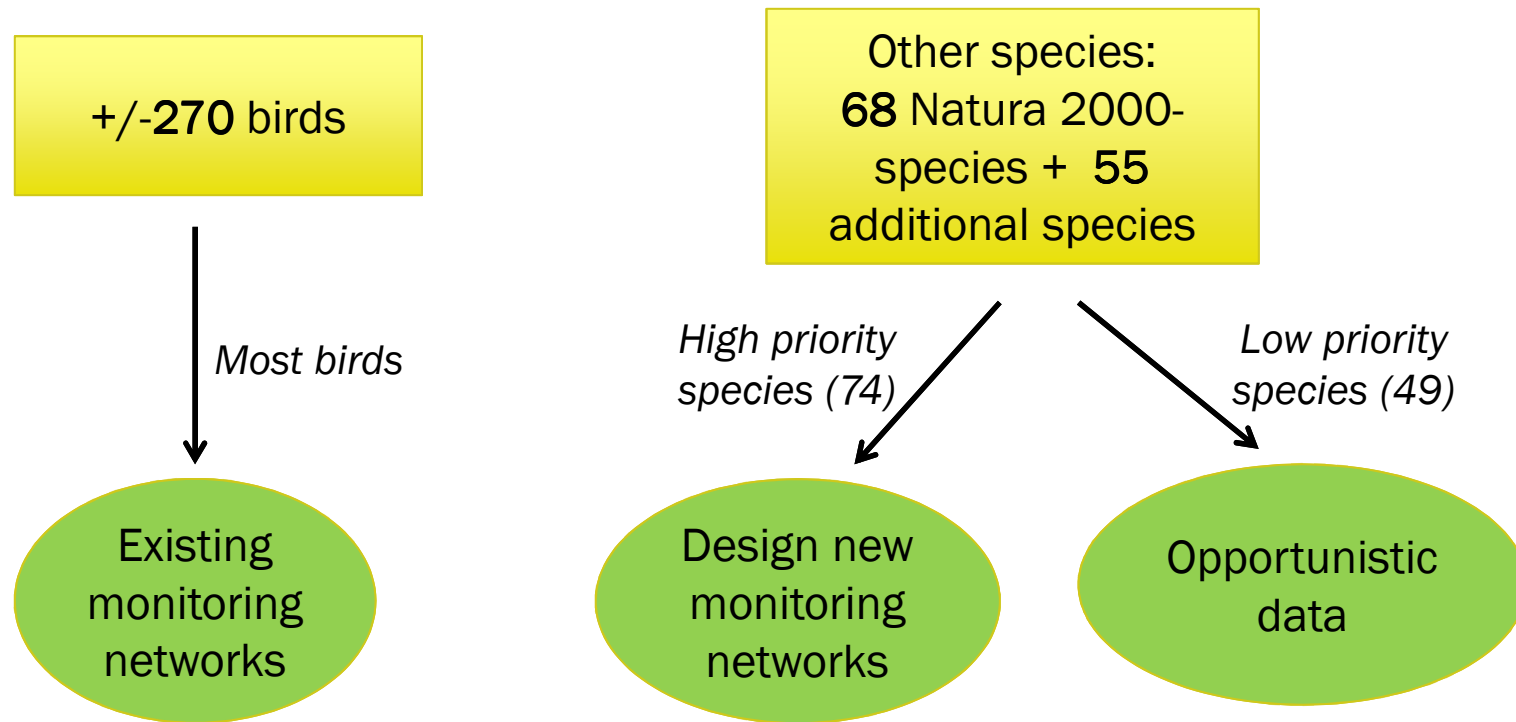




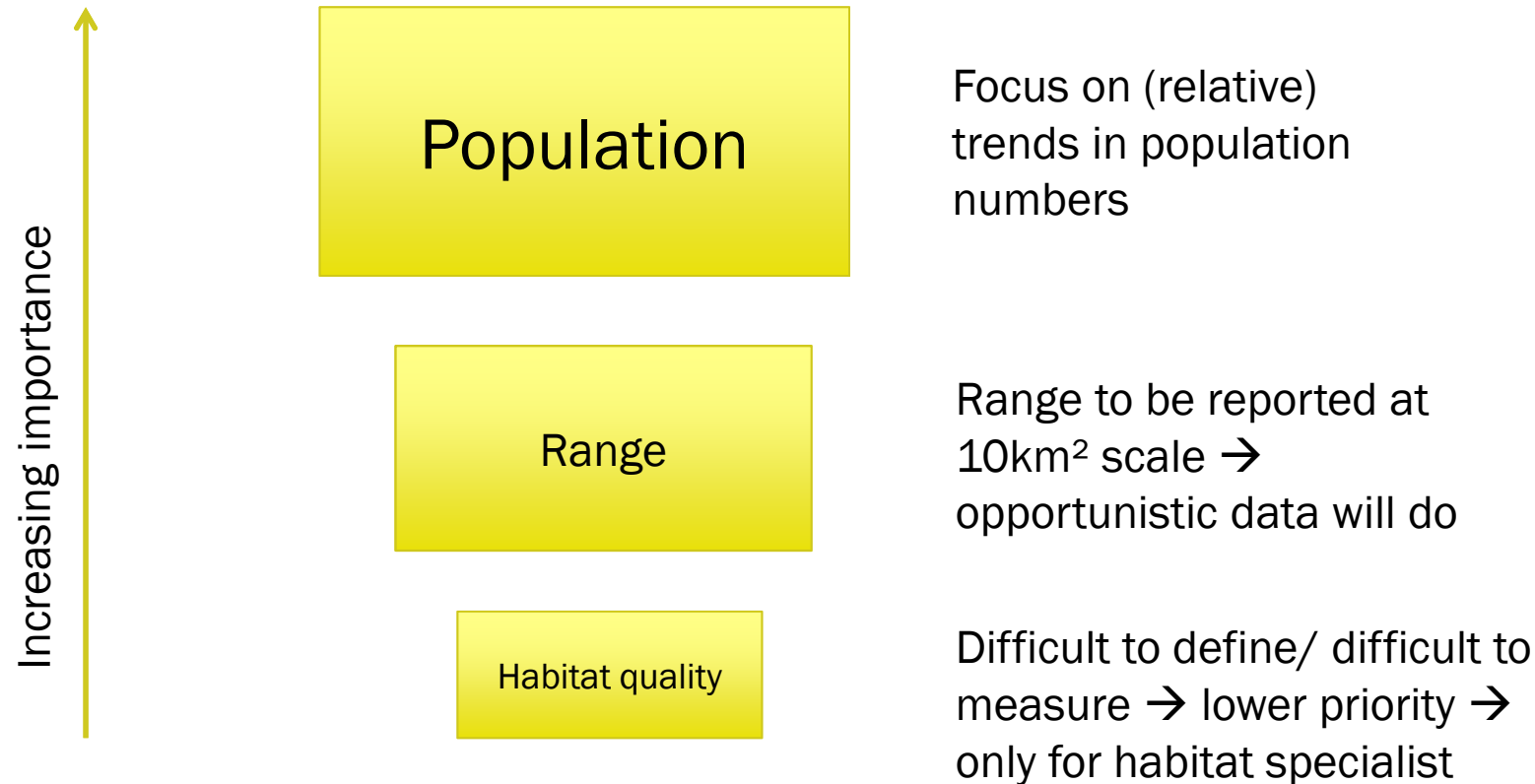
# Results Phase I: prioritizing information needs

- ☉ Prioritize species
- ☉ Prioritize questions

# Results Phase I: prioritize species



# Results Phase I: prioritize questions



# Results Phase I

## • Minimal detectable trend (in population numbers)?

- EC specifies that a population is unfavourable if negative trend of 1%/year
- Not realistic within reporting period of 6 years
- More realistic interpretation: 24% / 24 years

## • Avoid false expectations

- Monitoring networks will give information on trends in population numbers at the scale of Flanders (not at local scales)
- Monitoring networks will not give information on the cause of observed trends
- At the short term only large differences in population numbers can be detected

# Designing monitoring networks

# Designing monitoring networks: general approach

- ④ Monitoring technique
  - ④ Mainly existing techniques
  - ④ Balance between standardization and applicability by volunteers (with minimal training)
- ④ Sample design: number of locations
  - ④ Many rare species → all locations are visited
  - ④ More common species → sample of n locations
    - Power analysis for some species
    - Rules of thumb:  $n = f(\text{detectable trends size, power})$
    - Practical constraints: what is feasible?
      - Balance between monitoring efforts/costs and information quality
- ④ Sample design: site selections
  - ④ Random spatially balanced sample ← → site preferences by volunteers

# Designing monitoring networks: Number of sites – rules of thumb

## ☉ Target:

- ☉ Minimal detectable trend: 24% over 24 years

- ☉ Statistical power: 90 %

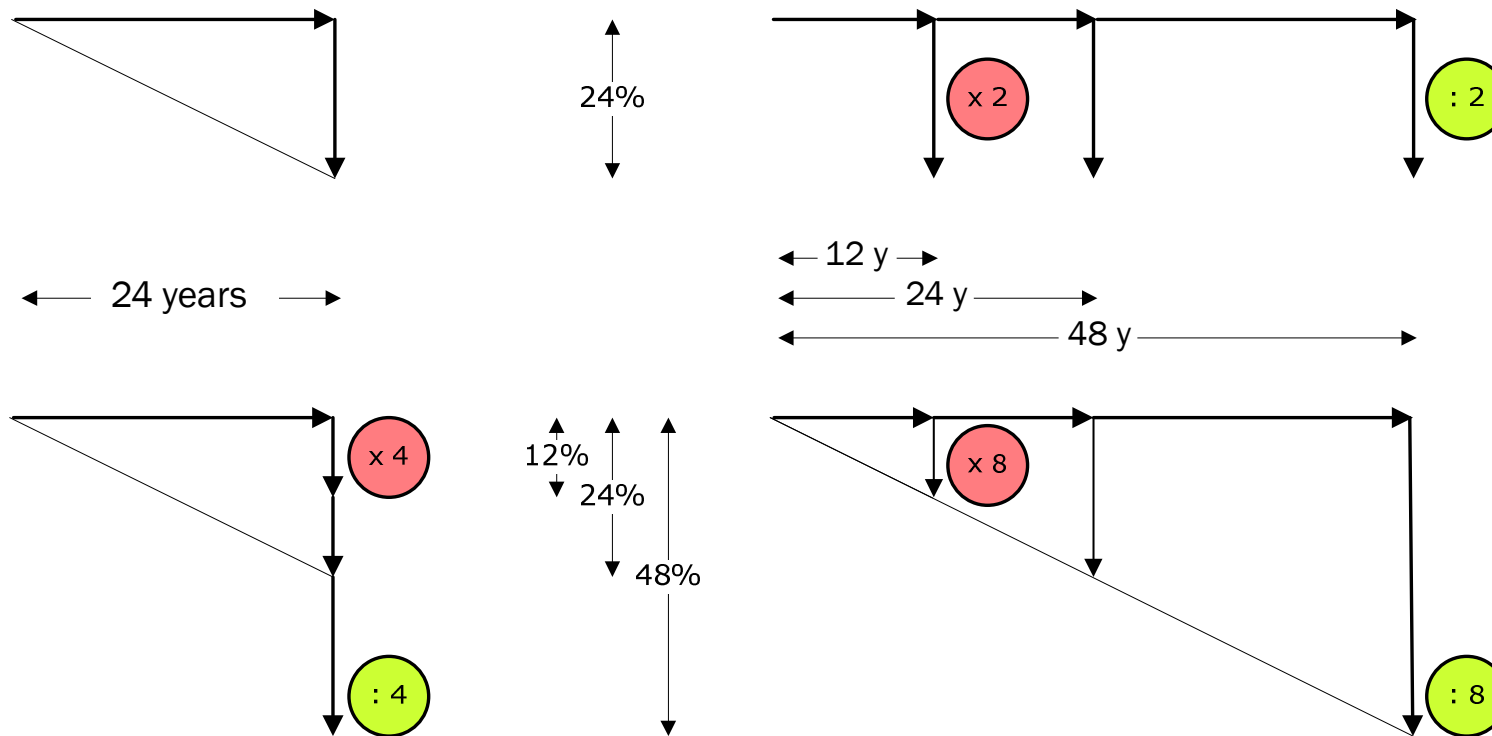
- ☉ Significance level: 10%

- ☉ Sample size needed to reach target is not always possible

- ☉ Sample size can be lowerd by altering parameters

# Number of sites – rules of thumb

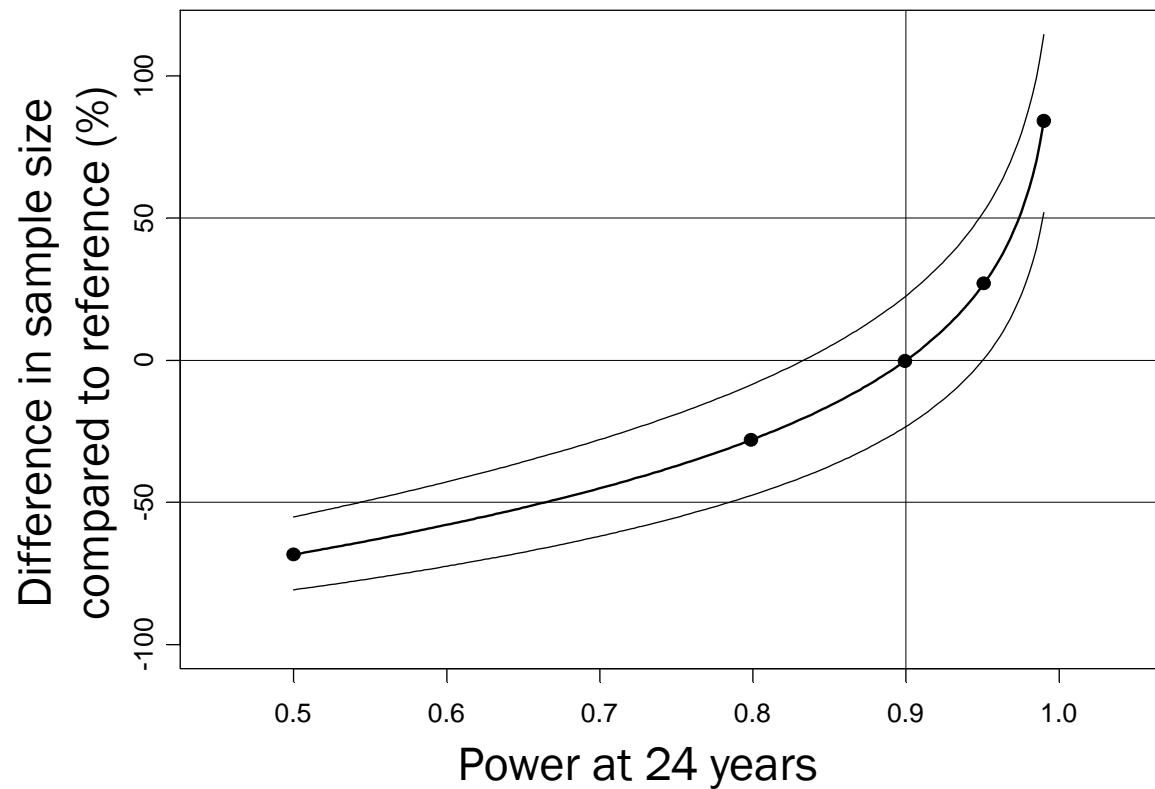
- Sample size as a function of minimal detectable trend and monitoring period





# Number of sites – rules of thumb

## Sample size as a function of statistical power



# Conclusions

# Conclusions

- **Prioritizing information needs: essential step**
- **Rules of thumb can help in finding a good balance between monitoring cost and information quality**
- **Volunteers should be involved in the design process**

**Thanks for your attention!**

**Questions?**