

An introduction to Bird Survey and Census Techniques

Part 1

What are bird surveys?

- Defined as a one-off census or sample survey or atlas
- Can cover one species, a group of species or all species
- Usually designed to assess numbers and distribution
- Often carried out over large areas with many observers (often volunteers)
- If repeated, can assess *changes* in numbers and distribution: ***monitoring***

Why do we need bird surveys?

- To assess populations and distributions quantitatively
- To provide a baseline for future surveys
- To provide information for prioritisation of conservation effort
- To add scientific credibility to conservation work
- To generate baseline data for more intensive research
- To comply with legal requirements (e.g. EIAs)

Other benefits of surveys

- Increased environmental awareness
- Education and fund-raising
- Publicity
- Collect other information
- Development of observer networks
- May document unexpected phenomena

Monitoring

- Assesses changes in population, distribution etc.
- Based upon repeated surveys, usually of the same areas
- Monitoring can track changes in total numbers of birds, a sample of birds or a combination of both
 - Often expressed as an index which may combine the results of several schemes

Why do we need monitoring?

- Bird populations and distributions change:
 - Natural fluctuations
 - Persecution
 - Habitat change/loss
 - Disease
 - Climate change
- Monitoring is a way of tracking these changes and identifying conservation priorities

Strengths of monitoring

- Scientifically credible
- Indices are understood by politicians and experts alike
- Can simplify complex processes
- Quantitative
- Often sheds light on causes of change

An introduction to survey design

Part 2

Bird surveys can assess:

- Single species (e.g. W.I. Whistling Ducks)
- Groups of related birds (e.g. herons and egrets)
- Single habitats (e.g. wetland or woodland birds)
- Many species across habitats (e.g. colonial nesting seabirds)

Types of surveys

- One-off - sample survey/ census/ atlas
- Monitoring - sample survey/ census/ atlas repeated at intervals

Census versus sample surveys

- Absolute count/census – when complete coverage can be achieved
- Sample surveys – when complete coverage cannot be achieved. The information collected in the sample is extrapolated to a larger area

Survey design

Sampling Strategy - *how to choose where to count and how to count*

If sampling is used - need to decide

- how many samples
 - Some methods require minimum sample sizes e.g. density estimation
 - 60-80 bird records for line transects
 - 80-100 bird records for point transects
- Pilot study to collect and examine data

Common sampling strategies

- Free plot choice
- Regular grid
- Random
- Random stratified

Common survey methods

- Area counts, census, absolute counts, spot or territory mapping
- Line transects
- Point counts

Key issues

- **Precision**- how much error is there around an estimate or how close are repeated samples to each other?
- **Accuracy** - how close is the estimate to the real value? *However we rarely know the true value!*
- **Bias** - Are the estimates systematically larger than, or smaller than, the true value?

Sampling Considerations

- Use appropriate sampling strategy
- Use appropriate survey method
- Use qualified and experienced observers
- Identify and attempt to remove sources of bias

Sources of bias:

Detectability

Census method

- Effort & speed of records
- Habitat differences
- Bird Species
- Bird Density
- Time of day
- Season

Weather – avoid poor conditions: Cloud ,
rain, wind, high & low temperatures

Sources of bias:

Observer bias:

- Observer skills always vary
- Most contacts are calls or song (how to treat heard birds)
- Pilot fieldwork methods for one week
 - Monitor observer differences
 - Census days
 - Proportion of bird records identified

One solution is to standardise methods for all observers:

- Count method
- Time of day
- Season
- Effort and speed

Improve observer skills

- Provide detailed instructions
- Provide training - workshops
 - census methods
 - review skills
- Species Identification - field guides, tapes
 - field trips
- Feedback & encouragement

Check list for Designing and Conducting bird surveys

1. Define specific questions
2. Design your sampling strategy
3. Design your survey methods
4. Prepare recording forms and instructions
5. Supervise fieldwork
6. Collect and collate results
7. Analyse data and publish results

Checklist details

1. **Define objectives** - the first, and most important, step is to define very clearly the aims of the survey. Consider how the information will be used. Ask specific questions which are appropriate to surveys and do not attempt to answer questions which are beyond the power of a survey to answer
2. **Design sampling strategy** - Identify resources - people, expertise, funding
 - what is the sampling unit?
 - how many sampling units can be covered?
 - how to select sampling units (Random, Grid, Stratified)?
 - what are the possible sources of bias and how can we reduce bias?

Checklist details contd.

3. Design survey methods

- mapping?
- transect?
- point count?
- What are the possible sources of bias and how can these be reduced?

What to record?

- bird numbers
- sex or age of birds?
- habitat data?
- nesting activity, nest sites?
- bird behaviour or activity?
- when to record?

Checklist details contd.

4. Prepare recording forms and instructions

- design recording forms - *very important* - a badly-designed form might collect the wrong data

Things to include: observer's details (name, address etc.), date, time and duration of visit, location of visit, weather, areas covered, observer's comments and observations

- draw up full instructions -
- define habitat codes (if needed)
- provide identification details (if needed)
- provide other information for fieldworkers
- provide letter for landowners/officials etc.
- send cards to fieldworkers

A good design needs a lot of thought and discussion, try it out on a few fieldworkers first, search carefully for any ambiguity

Checklist details contd.

5. Supervise fieldwork

- managing fieldworkers
 - make them *want* to take part
 - establish a network of local organisers and groups
 - make sure they have plenty of information on why the survey is being carried out
 - make sure there is a contact for them if they have problems
 - make them feel part of a team
 - always acknowledge their efforts
 - make sure they get a copy of the results

Checklist details contd.

6. Collect and collate results

- After the fieldwork collect and computerise the data as soon as possible

7. Analyse data and publish results

- analyse the data and get the results out as soon as possible
- publish the results as widely as possible, including in a scientific journal
- maximise the publicity and policy potential of your findings - summarise the key results and their importance, get them to the right people and avoid naïve, political or economic recommendations where not necessary.

Conclusion

All surveys are different

- Different surveys collect different data in different ways because they try to answer different questions about different species
- Try to design your survey to collect the best information to answer **your questions**; only copy methods from other surveys if they help you answer those questions
- A good method for one survey might be a bad method for another

But all good surveys are essentially the same

- because all good surveys use the best methods for the particular questions being asked
- so two surveys might be totally different in design and methods, but they may both be the best to meet the survey's aims

Overarching conservation consideration

- Whatever methods you choose to employ for your surveys one of your most important concerns should be to minimise the impact your work will have on the species you study.
- Carefully weigh the potential benefits **to the target species** of high impact methods and be willing to accept less accurate estimates if your impact will not be of net benefit to the birds.