Bird survey methods

Baseline

NATIONAL PARKS ASSOCIATION OF NSW INC

NATIONAL PARKS & WILDLIFE SERVICE N.S.W

BIODIVERSITY Life's Variety

Bird survey methods

Baseline survey

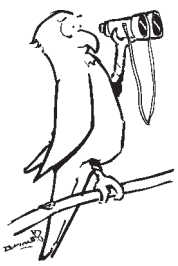
Claire Carlton, National Parks Association

Animal welfare

- Avoid close-range observation wherever possible during breeding and feeding.
- Avoid overuse of mimicry calls as they can distract birds.
- Do not disturb nest sites as birds may abandon eggs or chicks.
- Do not, under any circumstances, remove eggs from a nest.
- It is illegal to trap birds in NSW without a scientific licence from NPWS.
- It is illegal to undertake a research study on birds in NSW without animal ethics approval.

What collection methods?

All of the data collection methods relating to baseline surveys listed below are explained in detail in the rest of this booklet.



Methods	Animal handling licence required
Point count	✖
Opportunistic	✖

Setting up your transect

- A 500 metre transect has been chosen to use as an example. Use flagging tape to mark out the start and finish points and then five points, 100 metres apart are marked out along the transect. Point one is located 50 metres from the beginning of the transect and all other points are 100 metres apart (see Figure 1 below).

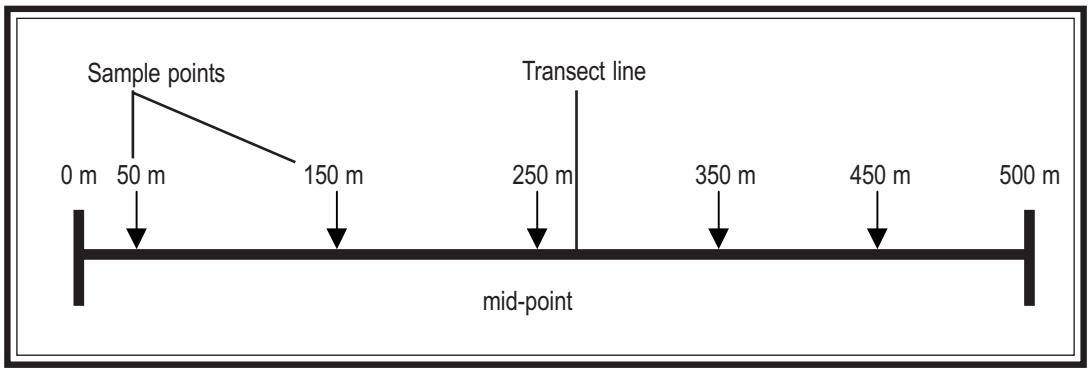


Figure 2: *Example of 500 metre transect*

- Each sample point along the transect should be marked with flagging tape.
- Each sample point should be assigned a unique identification number to be entered onto the birds field data sheet in the first column in the observations table.
- The position of each sample point on the transect (in metres) and its sample area identification number should be written onto the flagging tape. This tape must be removed when the survey is finished as it may be confusing for future surveys. On a topographic map record where the transects are located and keep this as a permanent record.
- Imagine a bullseye target at each point along the transect. When standing at each transect sample point for a ten-minute period, birds seen or heard within the bullseye are recorded. he areas are divided up as 0 – 15 metres, then 15 – 30 metres and finally 30 – 50 metres from the middle of the sample point. All birds entirely outside the bullseye area but within the same habitat are recorded as opportunistic. T
- Put flagging tape up at distances of 15, 30 and 50 metres from each sample point along the transect to assist with recording the distance birds have been seen from the transect.

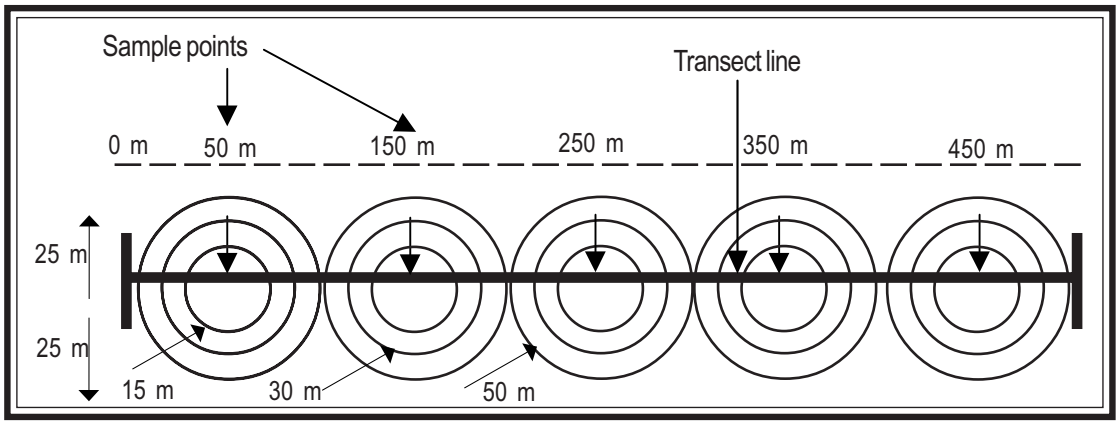
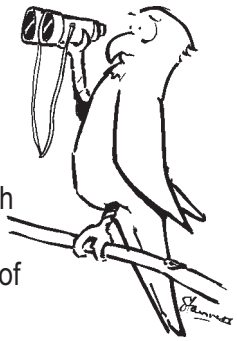


Figure 2: *Laying out the bullseye targets on a 500 metre transect*

Point count method



The basic method that has been chosen is based on setting up a single line at each site called a transect. Birds can be identified either visually, or by their calls. This method involves identifying all the birds you see or hear while standing at a series of points along a transect (a straight line through the site).

A systematic search (over a fixed area and/or for a fixed time) such as the method specified here has the added advantage of providing an index of the abundance of individuals and species, which can be later compared with other sites where the same systematic search method was used. The reliability of the abundance index can be reduced by either overestimates or underestimates of bird numbers. To reduce overestimates, particularly when several team members are observing, try to ensure that each individual bird is recorded only once. Inexperience bird watchers may find they need to refer to books to aid identification, which will reduce the time spent watching and may result in underestimates of abundance. Hence, ensure that a least one member of the team is watching at all times.

Equipment needed

- Compass
- Topographic map of survey area
- Clipboard, pencil and eraser
- Small notebook for making your own notes of special events seen
- Watch
- Bird field data sheets (one set for each survey site)
- Plastic sheets or large clear plastic bag to protect data sheets when raining
- Bird field guide
- Binoculars: 8 – 10X magnification and 40 – 50 millimetres field of view, that is, 8x40; 10x42; 10x50.
- Lens tissue to clean the binocular lens and glass
- Whistle for when separated from group
- Flagging tape or strips of coloured material
- Cassette recorder, cassette tape and spare batteries to record unknown bird calls (optional)

Bird survey teams should:

- Be small in size with two to four members in each team;
- Have one team member nominated as the scribe and therefore be responsible for accurately and consistently recording the bird observations provided by other team members; and
- Speak and move quietly and avoid sudden movements.

A count should be conducted on all transects each day the survey is running, unless weather conditions are such that it would be difficult to see or hear the birds.

All transects should be surveyed in a different order each day because the birds observed will vary depending on the time of day.

Bird counts are conducted at the start of first light which is before sunrise. This is the time when birds vocalise most, and is known as the "dawn chorus". It is also a time of maximum bird movement as birds move through the bush to begin feeding. All transects should be finished within 3 to 4 hours after first light.

On cold mornings keep your binoculars inside clothing when not in use. This will reduce fogging when you are looking through them.

Always check where you are standing when you stop to view a bird, as ants have little respect for busy bird watchers.

The steps you need to follow to use this method are:

1. Position the team at the first sample point on the transect;
2. For 10 minutes note on the appropriate diagram the identity and position of each bird species seen or heard. (See the notes on how to fill out the bird survey field data sheet in the following section.)
3. By the end of the recording period the bird names should be transcribed to the observation table. Data entry should be completed for all the observations for the first recording period before moving on to the next sample point. This should be done as quickly as possible, as the "dawn chorus" is short.
4. When data transcription is completed, the team moves quietly to the next point on the transect. Note any birds you observe while walking on the opportunistic sightings field data sheet.
5. Repeat steps 2, 3 and 4 until all sample points on a transect have been completed.

Several observers may record the same individual bird, and effort should be made (by comparing the positions of the birds by each observer) to note that individuals are recorded only once on the data sheet.

Field data sheet

Physical environment
See Recording site details booklet

Moon
Several descriptions of moon phases are provided, please tick one.

Rain
Several descriptions of rain conditions are provided, please tick one.

Cloud cover
Visually estimate the percentage of sky obscured by cloud.

Sample point identification number
Each sample point should be assigned a unique identification number to be entered in the first column in the observations table.

Start time
For this sample area. Use 24 hour clock, eastern standard time.

Finish time
For this sample area. Use 24 hour clock, eastern standard time.

Bird species code
Enter the four digit species code from the list of bird species provided in the *Field Workbook*. If you cannot find a species in the list then leave this entry blank. A code will be found later.

Bird species name
Enter the species name from the table of bird species in the *Field Workbook* to the

manual. An abbreviated name is acceptable. Enter the common and scientific name.

Observation type
Use the single letter observation codes provided in the *Field Workbook* to record the type of observation relating to each species.

Number of individuals
The distance from the sample point to a bird is estimated and the number of individuals at the distance is recorded in the appropriate columns which are 0 – 15 metres, 15 – 30 metres, 30 – 50 metres.

The main value of noting whether birds are observed within a 0-15m, a 15-30m or 30-50m radius of the sample point is that it enables you to compare your results between sites with varying densities of vegetation (and hence varying visibility) after your survey is completed. Where vegetation is dense and visibility is consequenlty restricted to (for example) 30m, there is a much smaller area in which birds cna be observed than at a site where visibility is 50m or more. The actual abudnance and species diversity of birds may be the same at both sites, but the site with denser vegetation will have a lower count simply because a smaller area can be observed from the sample point. The results can be adjusted for variable visibility by excluding observations made at sites with better visibility which are 30-50m from the sample point. All sites can then be compared using only birds seen within a 0-15m and 15-30m radius of the sample points.

Only record the number of individuals that have definitely been seen or heard. For example when one or two thornbills are seen there are generally more around but assumptions cannot be made when filling out the data sheets. Only actual birds identified and counted should be recorded. If unsure whether an individual has already been counted, it is best to assume that it has not.

Remember that an individual bird is likely to move around the site during your observation, and try to avoid counting the same individual more than once.

All opportunistic bird sightings or hearings should be recorded on an opportunistic animal sightings field data sheet. Opportunistic sightings or hearings include all birds seen or heard outside the recording time period of ten minutes spent at each sample point. This situation may occur when team members are walking between sample points or setting up the transect. If a bird is flying over the transect, even during the recording time period, without stopping they are recorded as a opportunistic sighting.

Any bird seen or heard outside the sample area boundary of 50 metres but during the ten minute recording period should be listed on the opportunistic sightings field data sheet.

NPWS

Yellow tufted honey eater

Special considerations and tips

- Weather such as wind, heavy rain, mist, fog, haze and electrical storms are good reasons not to conduct a bird survey.
- When a bird survey transect is in dense habitats where it is difficult to see birds it may be necessary to reduce the size of the circle at each sample point, for example, in dense forest or high dense shrub where visibility is not more than 20 metres. In such cases you can survey within the 15 metres or 30 metres radius sample area (see Figure 3 below).
- It may be difficult to identify some species in dull light. If a transect is in an area that is still in darkness after sunrise, like a steep gully, then this transect should be done later in the morning as the light in the sky increases.
- Teams that include members who have never identified birds before may benefit from extra training handouts. For example, Figure 4 overleaf should be included in handouts to assist the development of member's observation skills, or, examples of common local birds could be exhibited during the team briefing sessions.
- Another method for training team members that can be used in conjunction with observation is recording the calls at each point along the transect, making a note of the counter number on the tape recorder. These tapes can then be taken back to camp when all transects are done so that all team members can become more familiar with the bird calls and assess any discrepancies. Recording will work better if you have a directional microphone.

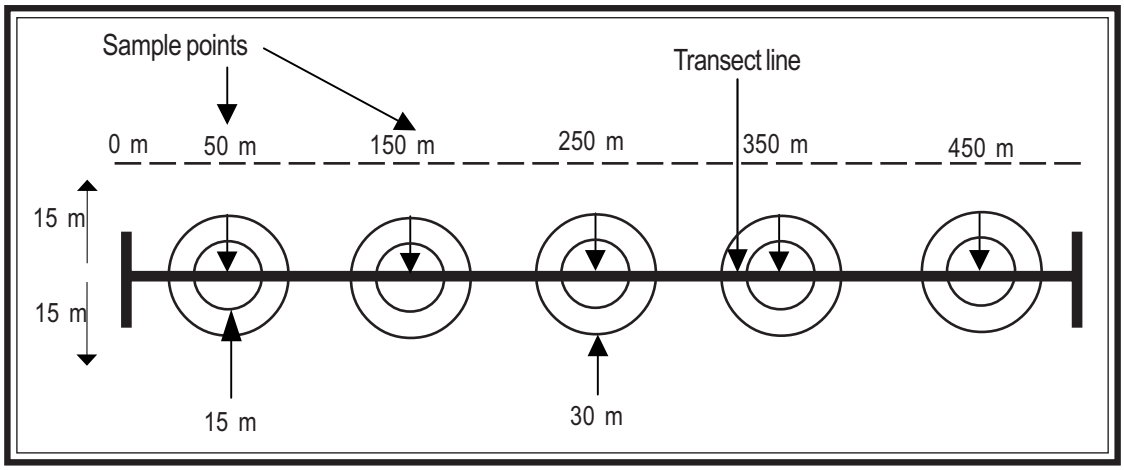


Figure 3: *Example of a bird observation transect in conditions of low visability due to dense vegetation*

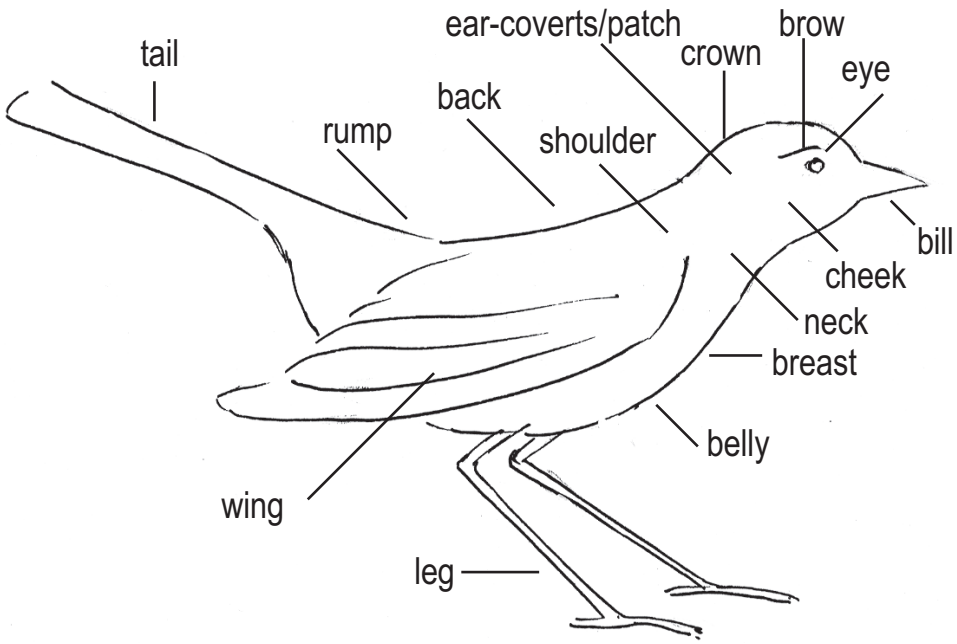


Figure 4: *Bird diagram*
illustration by M Robinson

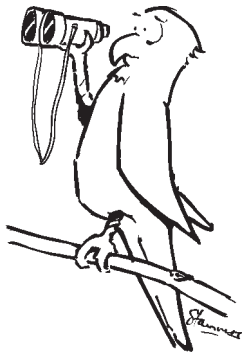
Animal care issues

- Any birdwatcher should avoid close-range inspection during breeding and feeding as this may disturb the bird. In extreme cases, a bird may permanently abandon a nest site if it feels threatened by humans observing too closely. Aggressive or disturbed bird behaviour (loud repeated calls or frantic flight) may indicate that you are too close to a bird's nesting site. Consult the field guides recommended at the end of this booklet for information on when birds are likely to be breeding.
- Remember that some birds nest on the ground or in vegetation very close to the ground. Be careful where you walk when pushing through dense shrubs so that you don't disturb nests.

GRAHAM ROBERTSON/NPWS

Black Kite

Opportunistic bird sightings



Many species will be detected while travelling to and from survey sites, or outside standard survey times or survey sites. Birds may be identified opportunistically either by their call or by their appearance. Record all of these sightings and their locations, dates and times for the whole survey on the opportunistic bird sightings data sheet provided.

This additional information is valuable as it helps to build the list of birds recorded for each area.

Equipment needed

- Compass
- Topographic map of survey area
- Clipboard, pencil and eraser
- Small notebook for making your own notes of special events seen
- Opportunistic animal sightings field data sheets and code tables.
- Code tables
- Plastic sheets or large clear plastic bag to protect data sheets when raining
- Bird field guide
- Binoculars: 8 – 10X magnification and 40 – 50 millimetres field of view, that is, 8x40; 10x42; 10x50.
- Lens tissue to clean the binocular lens and glass
- Whistle for when separated from group looking for a bird

Field data sheet

The opportunistic sightings field data sheet and code tables are provided at the end of this booklet as well as in the *Field Workbook*.

Date of first observation
Enter the date of the first opportunistic observation on the data sheet.

Date of last observation
Enter the date of the last opportunistic observation on the data sheet.

Species name
Enter the species name from the table of species. Enter the common and scientific name.

Species code
Enter the four digit species code from the list of species provided in the Field Workbook. If the species is not listed, leave this entry blank. A code will be found later.

Number observed
Enter the number of individuals observed. A code may be added after the number to indicate that the count is an estimate (see *Field Workbook*).

Observation type
Enter the single letter code from the list in the *Field Workbook* corresponding to the type of observation made of a species.

Habitat type
Enter the habitat code from the code tables.

Breeding
Enter a code from the table in the *Field Workbook* corresponding to indications you have of the breeding condition of the individuals that you have observed. If you do not know their breeding condition, then leave this field blank.

Written locality
Give a brief description of the observation locality.

Notes
Space is provided at the bottom of the data sheet for you to enter any additional notes that may help interpret any of the observations.

Special considerations & tips

- Take care to collect all field data sheets into a single bundle of sheets at the end of the survey. A survey that extends over several days can lead to an accumulation of opportunistic sightings entered on many copies of the opportunistic animal sightings field data sheet.
- If there is more than one opportunistic animal sightings field data sheet at the end of a survey, you should given them a sequential number when they are bundled up. This will greatly assist those involved in entering records into databases.

Animal care issues

- Any birdwatcher should avoid close-range inspection during breeding and feeding as this may disturb the bird. In extreme cases, a bird may permanently abandon a nest site if it feels threatened by humans observing too closely. Aggressive or disturbed bird behaviour (loud repeated calls or frantic flight) may indicate that you are too close to a bird's nesting site. Consult the field guides recommended at the end of this chapter for details on when birds are likely to be breeding.
- Remember that some birds nest on the ground or in vegetation very close to the ground. Be careful where you walk when pushing through dense shrubs so that you don't disturb nests.

Congratulations on completing a baseline survey for birds. The data that you have collected will provide you with some valuable information. You can build upon this by undertaking more surveys at different times of year, continuing these surveys on a yearly basis, or moving onto a comprehensive survey.

Further reading

Title: Australian Waterbirds: A Field Guide
Author/date: R. Kingsford; 1991
Publ.: Kangaroo Press Pty Ltd, PO Box 75, Kenthurst, NSW, 2156

Notes: *Waterbirds: useful and light-weight guide for work in creeks and swamps, easy to use, with description, distribution, habitat, colour photographs.*

Title: Readers Digest Complete Book of Australian Birds 2nd Edition
Author/date: R. Schodde and S.C. Tidemann (eds.); 1986
Publ.: Readers Digest Services, Sydney

Title: Field Guide to the Birds of Australia, A book of Identification
Author/date: K. Simpson and N. Day; 1993
Publ.: Penguin Books, PO Box 257, Ringwood, 3134

Notes: *Use for identification and the attached handbook is useful for beginners.*

Title: The Graham Pizzey and Frank Knight Field Guide to the Birds of Australia
Author/date: G. Pizzey and F. Knight; 1997
Publ.: Harper Collins, 25 Ryde Rd., Pymble, NSW, 2073

Notes: *Use for identification. Descriptions are detailed and illustrations are aligned with the descriptions.*

Title: Handbook of Australian and New Zealand Birds, Vols 1-3
Author/date: S. Marchant and P. Higgins (eds.); 1990-1996
Publ: Oxford University Press, Melbourne

Title: Shorebirds in Australia
Author/date: B.A. Lane and J.N. Davies: 1987
Publ.: Nelson, Melbourne

Title: What Bird Call Is That?
Author/date: T. R. Lindsey; 1987
Publ.: Angus & Roberstons

Notes: *2 x 60 minute audio cassettes of identified bird calls and illustrated guidebook.*

For more references visit the NSW Biodiversity Survey Program on the NSW National Parks and Wildlife Service' World Wide Web Page. The address is:

http://www.npws.nsw.gov.au/

Bird field data sheet

Survey area _____ Date: _____

Team Number _____ **Team Leader** _____ Site number: _____

Site location and description *(brief description using landmarks, photograph number, etc. so site can be located again)*

_____

_____

_____

Map Name _____ **AMG Zone** _____ _____

Map scale _____

(topographic map gives AMG zone, easting and northing)

Easting ___ ___ ___ ___ ___ ___

(6 digits; should be recorded mid-point along transect)

Altitude _____

(from topograhic map, written in metres)

Northing ___ ___ ___ ___ ___ ___ ___

(7 digits; should be recorded mid-point along transect)

Start time (24 hour)
Temperature at start (write in Celsius)

Finishtime (24 hour)
Temperature at finish (write in Celsius)

Wind (tick)

- ◯ 1. Calm
- ◯ 2. light, leaves rustle
- ◯ 3. Moderate, branches move
- ◯ 4. Strong, tops of trees move

Moon (tick)

- ◯ 1. No moon
- ◯ 2. less than or equal to 1-4 moon
- ◯ 3. less than or equal to 1/2 moon
- ◯ 4. less than or equal to 3/4 moon
- ◯ 5. between 3/4 and full moon
- ◯ 6. full moon

Rain (tick)

- ◯ 1. dry
- ◯ 2. light drizzle
- ◯ 3. constant drizzle
- ◯ 4. heavy rain
- ◯ 5. mist, fog or heavy haze

Cloud cover (in percentage of sky) _____

Opportunistic animal sightings field data sheet

Survey area _____

Team Number _____ Team Leader _____

Species name	Species code	Date	Number observed	Observation type	Habitat type	Breeding code	Locality description	Zone	Easting	Northing

Field data sheets

Bird field data sheet

Survey area _____

Team Number_____ **Team Leader** _____

Sample area identification number	Start time (24 hrs)	Finish time (24 hrs)	Bird species code	Bird name	Observation type	Number of individuals		
						0 - 15 metres	15 - 30 metres	30 - 50 metres