

## THE 20 MINUTE SEARCH - A SIMPLE METHOD FOR COUNTING FOREST BIRDS

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A simple method is proposed for estimating relative abundances of forest birds. An unmarked area of about 3 ha is searched for 20 minutes and all birds seen or heard are counted. The method has been used widely in Victoria and its scope and limitations are discussed.

Information is often needed about relative numbers of birds in forest habitats. Many people would like to collect this information but are deterred by the array of methods and the complicated analysis involved in many of them, often not justified by the quality of the data or the level of detail needed. Here a simple method is proposed which has provided satisfactory data about bird communities in south-eastern Australia (e.g. Loyn *et al.* 1983, Loyn 1985, Chesterfield *et al.* 1983). Many more sophisticated methods are discussed by Ralph and Scott (1981) and various methods used in Australia are discussed by Hermes (1981), Kavanagh and Recher (1983), Loyn (1978, 1980), Pyke and Recher (1984), Recher *et al.* (1983), Recher (1984), Shields and Recher (1984) and others.

### THE METHOD

This consists of searching an unmarked area about 3 ha, walking slowly and stopping at will and recording numbers of individual birds of each species seen or heard in 20 minutes. Results can be expressed as numbers of birds of each species per count (or per 10 or 100 counts, etc.), or as percentages of total birds observed. Species

can be grouped into families or guilds of species that behave in a particular way (e.g. bark-gleaning birds). The numbers of species observed per count can be used as measures of diversity. Total numbers of species in a habitat or area can be calculated by accumulating results from many counts.

If a single area is monitored through time it is important to keep the boundaries constant, which can be done by marking them or using natural features. If the searches form part of a general survey, there is no need to record boundaries, and the shape and even size of each area searched can be allowed to vary. In previous studies a rectangular shape has usually been chosen (about 200 m x 150 m, or 300 m x 100 m), though sometimes an irregular shape is more appropriate (e.g. coinciding with a colony of Bell Miners or a particular habitat). Birds observed outside the area chosen can be recorded as "off"; they should be excluded from analysis when monitoring an area through time but could be included in a general survey if they were still in the region or habitat under consideration. Such inclusion would create a bias in favour of conspicuous species with loud calls; the size of this bias varies with conditions,

but experience suggests that it is generally small. If successive searches are made in an extensive habitat, some of the same individuals could be recorded on more than one search (especially when "off" birds are included in the analysis). These can be recorded as "same" or "same off" but to make searches comparable they should be treated as different individuals in the analysis. This will involve a small bias towards conspicuous species, but such observations only form a small percentage of the total and if they were excluded the size of the bias would vary with the number of successive searches.

## RESULTS AND DISCUSSION

### *Why 20 Minutes?*

The method was developed in a study of fragmented forest patches, where the main aim was to find all resident species in 56 patches of 0.5 to 1 771 ha (Loyn 1985). It was found that a period of less than 20 minutes was insufficient to locate all birds even on the smallest patches, but that an area of up to about 3 ha could be searched adequately in that time. Units of 20 minutes were then adopted to obtain comparable data from larger patches. There was not enough time to measure and mark exact 3 ha areas and these were judged approximately; the main interest of the study was in the species present and absent, and their relative numbers, rather than in more accurate measures of population density. There could have been problems in interpreting numbers of birds per count between patches smaller than 3 ha, but in fact small patches had such grossly different bird communities (especially when native understorey had been destroyed by grazing stock) that no subtle interpretation was required.

The 20 minute period was also found to be useful in extensive forest, for monitoring specific areas such as Bell Miner colonies (Loyn *et al.* 1983) and in general survey work (e.g. Chesterfield *et al.* 1983). Shorter periods did not allow a thorough search, and it was clear that repeated shorter counts would give a heavy bias towards conspicuous birds that call often (e.g. White-throated Treecreeper); such individuals might be heard continually during a 20 minute search, but would only be recorded as single individuals. Inconspicuous species could be found by flushing, spotting briefly or hearing an occasional call some time during the period.

Longer periods were not efficient as few additional individuals were being identified in a 3 ha area; there were problems in interpreting bird movements and remembering bird locations (hence the use of mapping surveys in some studies). If the area covered was extended there would be more chance of confusing the analysis by including additional habitats. In surveys of extensive habitats, many 20 minute searches were made in succession while walking through the habitat and subtle habitat variations were recorded for each and analysed later when necessary.

There may be an ideal time and area for a search of this sort, though these parameters would vary with forest type and other conditions. A detailed study would be needed to work these out and the value of such effort is debatable; the purpose of this paper is to report personal satisfaction with the method described in a wide range of Victorian eucalypt forests (and some forests overseas).

### *Scope, Limitations and Comparisons with other Methods*

The method combines the simplicity of a simple transect with the flexibility of an area search. In essence it is very similar to the transects described by Recher *et al.* (1983) and Shields and Recher (1984), but by using a time period as the main unit of standardisation it avoids the need for measuring and marking out a study area. Shields and Recher concluded that their transect method gave a more complete sample than three other methods tested by them, and that it took the least effort. The 20 minute search gives greater flexibility; for example in a given time a single area could be searched repeatedly, or many adjacent areas could be searched to give a general indication of the avifauna in a larger region or more extensive habitat. When the habitat changes, the direction of travel could be altered or searches begun in the new habitat.

Time of day and weather conditions affect any census method. However, transects and area searches are buffered against these effects to a greater extent than short stationary counts in the same way that they have less bias towards conspicuous species. Under poor conditions, individual birds are seen or heard less often than under good conditions, but the totals found in 20 minutes are not reduced in proportion. Experi-

ence has shown that 20 minute searches can be continued throughout the day except when the wind is strong or on hot afternoons. The same buffering applies to differences between open and enclosed habitats, though care obviously needs to be taken especially when making searches in very open habitats where large numbers of individuals may be "off" the imaginary area, and thus relative abundance could be over-estimated. Even in this situation the method can be useful in obtaining data on species composition. It is important that observers should be alert and reasonably skilled. Knowledge of calls is especially important in dense forest habitats where over 90% of records are by call alone.

The method could have similar applications to the Rolling Bird Survey (Cullen 1980) where bird species, but not numbers, are recorded in 5 minute periods by a stationary observer. The Rolling Bird Survey method is clearly standardised and avoids the need to count birds. However, counting is not an arduous procedure and the 20 minute search has many advantages for obtaining data on bird communities. The merits of the 20 minute period have already been discussed. There are also merits in searching rather than remaining stationary as more birds can be found in a given time, though there may be a slight loss in terms of standardisation. Counting birds was necessary to reveal the spectacular influx of psyllid-eating birds after experimental removal of Bell Miners (Loyn *et al.* 1983), and counting is essential for surveys where it is desired to measure relative abundance.

The main limitation of the method is that it does not measure absolute abundance. Comparisons of bird population densities between areas must be made with caution, particularly with regard to any differences in the open nature of the habitats. Nevertheless gross differences will be evident with this as with many other survey methods. Data can be obtained from far more areas than by the more accurate method of territory mapping or other methods where precise areas are marked out. Methods where distances to individual birds are measured are tedious and involve complicated and sometimes questionable analysis. The important point is that forest bird communities differ enormously in the relative abundances of different species and such differences are generally of greater interest than fine differences in absolute population density.

These differences in relative abundance can be clearly demonstrated by various survey methods, of which the 20 minute search has proved particularly simple and effective.

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