

Recommendations for Inventorying and Monitoring Landbirds in National Parks

The following information is excerpted from "Recommended methods for inventorying and monitoring landbirds in National Parks" by Steven G. Fancy and John R. Sauer.

Last update: September 19, 2002

Key Points:

- Dozens of different approaches are used to sample birds in North America, and there is no single method that can be used to sample all species. Survey methods tend to be developed to sample groups of species that share common habitats (e.g., waterfowl, shorebirds), although some surveys are aimed at single species (e.g., piping plovers). Here, we focus on methods that sample bird in terrestrial habitats such as forests, grasslands and deserts, and provide references to sampling methods for other groups such as shorebirds and seabirds.
- As in all biological surveys, there are 2 general principles to consider:
 - All areas for which you want information must have a chance of getting sampled by the survey; survey results do not apply to areas that are not sampled.
 - Biological survey methods tend to miss animals during the actual counts, as individuals and species are not detected by a simple count. Some sampling methods (such as distance sampling) allow for estimation of the detection rates, and others (such as simple point counts) do not. For most objectives, it is necessary to use methods that allow for estimation of the detection rates.
- The recommended method depends on the objective of the survey.
 - If the purpose is simply to generate a checklist of birds in a park, the best approach is to have qualified observers go to all of the interesting areas in the park and record what they find using a "microatlas" approach.
 - If the purpose is to get some idea of distribution by species and a qualitative assessment of relative abundance such as "abundant", "common", or "rare", then point counts or strip counts or some sort of index method are suitable.
 - If the manager is interested in comparing bird abundance among species, habitats, or sites, or in determining trends in population size, then it is critical to implement additional procedures to ensure consistency over time and space, primarily by adding some measure of detectability, and we recommend distance sampling (line transect or variable circular plot [VCP] sampling) or double-observer (DO) methods.
 - If the objective is to obtain information on primary demographic parameters or vital rates (productivity and survivorship) to help determine causes of bird population trends, we recommend constant-effort mist netting and banding such as used by the MAPS (Monitoring Avian Productivity and Survival) program.
- We do not recommend use of traditional (or unadjusted) point counts for estimation of abundance.
 - In point counts, a single observer stands at a sampling point and records the number of individuals of each species heard or seen during a specified time period without any attempt to estimate detectability.
 - Although this method is used in the North American Breeding Bird Survey (BBS), point counts cannot be reliably used to compare bird abundance among species, different habitat types, or among observers. Because surveys are done in many habitats by many observers in National Parks, point counts will not provide acceptable information for the

GIS applications and other likely uses of bird data.

- We recommend that point count protocols can be modified using VCP or double-observer methods to allow estimates of detectability for many species and yet still allow comparisons to historical data obtained with unadjusted point counts.
- Use of methods that allow for estimation of detectability are recommended for projects funded by the NPS Inventory and Monitoring Program. We think that the improvement in the quality and credibility of data compared to that obtained by unadjusted point counts more than justifies the increase in cost and effort required to incorporate an estimate of detectability.
 - Distance sampling or the double-observer approach are the default methods. Any proposal to use unadjusted point counts or some other index method when the objective is to compare differences among species or provide population trend information must provide good justification for why the better methods cannot be used.
 - Although distance sampling requires additional training and is not a panacea for all species, it can and is being done throughout the country in many types of habitats.

[Download Recommended Methods for Inventorying and Monitoring Birds in National Parks](#)

The following documents and database are works in progress, but are made available here for those that find them useful. The protocol example will be updated with instructions on managing data in MS Access and analyzing data using the Distance 4 software.

(January 2004 update: the data analysis portion of the protocol, including instructions for exporting data into the Distance 4 program for analysis, still needs to be developed. Contact Steven Fancy by email if you need something right away.)

[Download draft protocol](#) Bird monitoring protocol for Agate Fossil Beds National Monument, Nebraska and Tallgrass Prairie National Preserve, Kansas, by D. G. Peitz, S. G. Fancy, L. P. Thomas, and B. Witcher, Prairie Cluster prototype monitoring program.

[Download draft database](#) Database that follows the Database Template format, that allows you to enter and summarize data collected using the protocol described above.

How do we know if these methods work?

Is there any evidence from field studies that VCP counts really are better than unadjusted point counts? Recent studies in Hawaii where the "true" density of birds was determined by another method and compared to densities determined by VCP counts indicate that the answer is yes. The best "test" was a study where a species of solitaire was being reintroduced to an area where it had gone extinct 100 years ago. All birds carried transmitters and were tracked intensively to determine their location. A separate team conducted vcp counts. Four separate counts were conducted over a period of a couple of months as more and more birds were released.

 [Download Nelson and Fancy 1999](#) Nelson, J. T. and S. G. Fancy. 1999. A test of the variable circular-plot method where exact density of a bird population was known. *Pacific Conservation Biology* 5:139-143.

The discussion section of the following paper describes three different studies where the "true" density of birds in open forest and closed forest situations was estimated by intensive searching or banding studies. These studies are not as convincing as the one above because the results of vcp counts are being compared to that determined by another method, and both estimates contain error, but these are

the best field methods available to test the method. Earlier studies in California and elsewhere used an outdated approach for analyzing the data collected by vcp counts that has since been shown to produce highly variable results.

 [Download Fancy, S.G. 1997 A new approach for analyzing bird densities from variable circular-plot counts. Pacific Science 51:107-114.](#)

The beta version of [DISTANCE 4 Software](#) contains a number of new features to make it easier to analyze data collected using vcp counts. Additional material and examples specific to monitoring birds in national parks are being developed.

[\[Back to Monitoring Table of Contents\]](#)