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INTRODUCTORY REMARKS: ENVIRONMENTAL INFLUENCES

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An accurate estimate of the number of birds in a community or population is the goal of all census work. We may argue whether absolute or relative numbers are needed, but we can not escape the need for accuracy and precision. Ultimately the accuracy of a census and our ability to replicate results depends on how well we control for variation in methods and the environment in which we work.

The effects of weather and time of day on avian activity are well known and easily corrected for in the design of census procedures. Other variables, such as the structure of vegetation, topography, environmental acoustics, and changes in the detectability of birds at different stages of the reproductive cycle, are not as well known, nor are they easy to control. Accounting for these variables requires a detailed understanding of the system in which we work and the biology of individual species.

I can illustrate some environmental problems from my own efforts to count birds in Australian heathlands and forests. At first I thought that Australian birds were like those in the temperate regions of North America. I assumed that only males sang, that a reproductive unit consisted only of a mated pair, and that each unit was territorial. In other words, my birds were good Christians.

I now know that I was wrong. The bird communities that I work with in southeastern Australia are very different from those first naive assumptions. Nesting is asynchronous; at any time more than half the individuals in a community may be non-breeding. Not all species sing—a fair number just make noise, and of those that do sing, both sexes may be equally vocal. There is a high level of song mimicry, fewer than half the species are territorial, and about a quarter of the species are group or social nesters. Moreover, the pattern of social or cooperative nesting can change between successive broods. Multiple broods are regular. For some species the first nesting is by a pair, but subsequent broods are reared with the cooperation of their older siblings. Unless these details are known for each species, it is difficult to obtain an accurate census.

The lesson here is that Australia may not be different from the warmer and less seasonal parts of the world. Persons attempting to count birds in these places must keep in mind that census methods have been developed largely in the cold north where my original assumptions are generally correct. We should be careful therefore to ensure that our knowledge of the avifauna and its adaptation to regional environments keeps pace with the level of sophistication of census procedures and means of data analysis. We also need to be aware of the different ways that the physical environment affects our ability to detect birds and understand how the human social environment may temper our freedom to conduct censuses.

In this section, the biological and physical factors which affect the activity of birds and our ability to detect individuals are described and suggestions made on ways to minimize their effects on census results. Methods can be standardized, observers trained and excesses of environmental change avoided, but corrections for the full range of environmental variation requires compensation on a species by species and site by site basis. Such attention to details may appear excessive, but it is necessary for accurate and repeatable results.

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