

merits.

In this regard, one of the most important accusations made against CBCs is that count areas are not randomly distributed. A random sample means each count area would have an equal chance of being selected. The rationale behind random sampling is that if one is to extrapolate the results of the annual survey to all of North America, those circles that are surveyed should be representative of the whole area. But count areas are not randomly selected. Indeed, because people go to counts closest to their homes, the suburbs are disproportionately represented relative to urban and remote areas. Birders cover urban locations less thoroughly than other parts of their count area (Wilds 1980). Inner cities are frequently excluded from the count (Butcher 1990).

But Drennan (1981) has made a case for CBCs as a reliable data base in spite of the absence of a random distribution of count areas. She said the distribution of birds in North America is itself non-random; that is, it is unevenly distributed on the continent. Therefore, it is more reasonable to select a stratified sample, that is, one which represents predetermined pieces of the universe. Drennan said it is more "efficient" to select count areas where there is a high species density than to pick areas of low density. In fact, the CBC is geared to sampling areas of high species density. The absence of randomness in selecting count areas is compounded because within each count area the areas selected to count birds are those where birds are considered most likely to be seen.

While this system may be justified by the premise that you go where the birds are, there are at least two defects with such a methodology, both arising from habitat changes. If a particular territory within the count area has been surveyed year after year, changes in the area because of housing construc-

tion or its conversion to agriculture, for example, will initially bias the count, depending on how birds adapt to the change. Second, habitat loss in areas not traditionally included in the count may increase the concentration of local birds within count areas over time, so that the counts are less accurate as a measure of total populations.

CBCs are important. There is no other group of organisms for which we have such counts and when used with care, the counts identify trends in the winter bird population. But birders need to recognize that they are supposed to be conducting scientific studies and not seeking the best rarity to be one up on their friends. The CBC is not a competition.

CBCs may be an imperfect measure of the wintering bird population, arguably even highly flawed. But the sheer weight of this massive data base and even the solid track record the winter counts have for verifying trends found in other ways creates a plausi-

bility that cannot be ignored. Perfect science it is not, but until another way is found to count the birds of winter, the Christmas Bird Count it is.

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Footnotes

¹ The BBS "encountered" 241 species more frequently than the CBC and the latter encountered 210 species more frequently than the former. (Butcher 1990, p. 12)

² It is worth pointing out that there are other possible explanations. For instance, because Sharp-shinned Hawks are more highly migratory, the winter ratio of Cooper's to sharp-shinned could be elevated.

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continued on page 86