

INDICATOR: ROCKWOOD, MICHIGAN CHRISTMAS BIRD COUNT– OVERWINTERING BIRD COUNT FLUCTUATIONS

Background

The first Christmas Bird Count (CBC) was held in 1900. Since then, this early winter bird census has grown to nearly 2,000 individual counts across the Western Hemisphere, with over 50,000 participants (Dunn et al. 2005). CBCs tally all birds located within a 24.1 km (15 mile) diameter circle on a single day in early winter around Christmas; dates have now been set during the period December 14th through January 5th. The National Audubon Society (NAS) sponsors the CBC program and has a central repository for the results. The results are published in a quarterly magazine and are also available online (Audubon 2005).

One of these 2,000 nationwide CBCs is centered in Rockwood, Michigan (42°03'35"N, 83°14'15"W) (Figure 1). It covers parts of Wayne and Monroe counties in Michigan and Essex County in Ontario. Approximate boundaries are Sibley Road (north), Amherstburg, Ontario (east), DTE Energy's Fermi 2 Power Plant near Estral Beach (south) and Carleton (west).

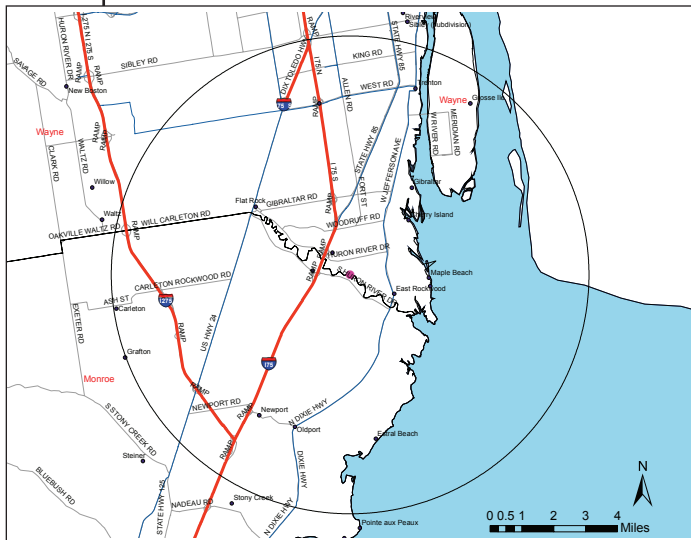


Figure 1. 24.1 km (15 mile) diameter designated count circle centered at Rockwood, Michigan.

The Rockwood CBC was founded in 1974. The first year was considered a test year and the data were not submitted to NAS. However, since 1975, the count has taken place annually and the data have been submitted to NAS and are available to the public for analysis. This document summarizes the Rockwood CBC for the 30-year period from 1975 to 2004, examines count trends for some species of interest, and provides recommendations for improving the count methods to more accurately survey bird populations within the count circle.

Status and Trends

The Rockwood CBC data were examined using actual numbers, not adjusted for survey effort. High year-to-year variability in the number of individuals within each species count is common in CBC data, especially due to variable weather conditions. In order to reduce short-term variability of the data and help evaluate trends, three-year moving averages were calculated (Raynor 1975).

The ten most numerous species observed on the Rockwood CBC (in descending order) are canvasback, European starling, mallard, herring gull, ring-billed gull, common merganser, Canada goose, house sparrow, mourning dove, and tundra swan. There were at least 38 species recorded on every count over the 30-year period.

One species of particular interest found on the Rockwood CBC is the American crow (Figure 2). Crow population trends are of interest because this species is a frequent victim of West Nile virus (WNV), vulnerable to all routes of transmission with extremely high



Figure 2. American crow (*Corvus brachyrhynchos*) (Photo credit: Jean-Guy Dallaire).

mortality (Caffrey 2003). WNV was first detected in the United States in New York in 1999 and in Michigan in 2001 (SOM 2005) (see “West Nile Virus in Michigan” indicator). Analyses of CBC data and Project FeederWatch data (a winter “citizen science” project sponsored by Cornell Lab of Ornithology) have indicated that crow declines have been geographically patchy (Bonter and Hochachka 2003; Caffrey and Peterson 2003), and that the recent crow declines were within the magnitude of previous fluctuations that have been seen on CBCs over the last 30 years (Bonter and Hochachka 2003). Nonetheless, crow counts decreased 60% in the upper Midwest in a comparison of Project FeederWatch results between the winters of 2001-2002 and 2002-2003, while 79% of CBC circles showed crow declines between those two winters (Bonter and Hochachka 2003).

The mean number of crows per year (636) on the Rockwood CBC during the pre-WNV period, 1975-2001, was substantially higher than the mean for 2002-2004 (35) after WNV was detected in Michigan (Figure 3). This finding is consistent with other studies comparing these periods. Data from within the pre-WNV years (1975-2001) show a significant overall decline. It should be noted

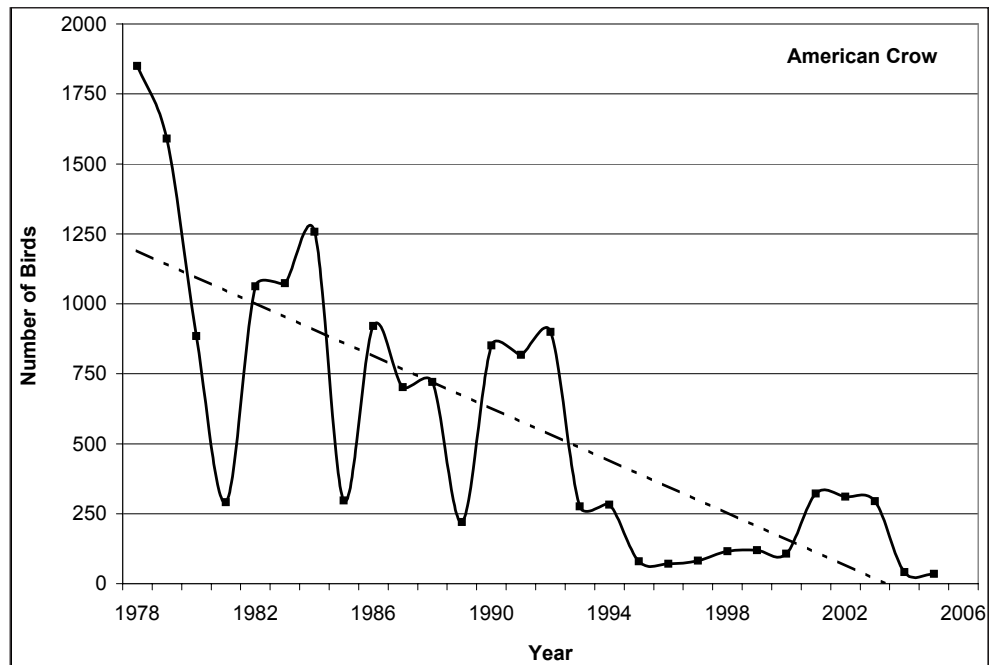


Figure 3. American crow Rockwood Christmas Bird Count trend displaying 3-year moving averages, 1978-2005.

that this is somewhat at odds with the results of other regional CBCs for the pre-WNV period. Analyses of CBC trends from 1959-1988 showed significant increasing annual trends for American crows in Michigan and Ontario count circles (Sauer et al. 1996). The trend for the nearby Detroit River CBC for 1978 (its first year) to 2001 was slightly negative, but not significant (unpublished data).

The crow counts on the Rockwood CBC have varied greatly from year to year, while they were much more consistent on the Detroit River CBC. These differences may reflect the tendency of crows to form large winter flocks and roosts (Caffrey and Peterson 2003), some of which may be very localized or displaced by changing land use. Because many of these flocks contain migratory birds, CBC data may not accurately sample resident birds (Caffrey and Peterson 2003).

The American black duck is also a species of particular interest on the Rockwood CBC. Black duck populations have shown a long-term (1970-2003) decreasing trend in North America (NAWMP 2004), and for the Mississippi Flyway (1955-2004) (USFWS 2004). This decline has been attributed to habitat loss, hunting, and competition and hybridization with the mallard (LePage and Bordage 1998; USGS 1998). Being much more adaptable to urbanization, mallards occupy territory being vacated by black ducks (due to hunting or habitat changes), which increases hybridization opportunities. This appears to be especially prevalent in southern Ontario (Longcore et al. 2000).

There was no significant trend for American black ducks based on the Rockwood CBC period of record (1978-2004; Figure 4). In general, however, there was a decreasing trend between the late 1970s and the late 1980s, followed by an increasing trend between the late 1980s and early 2000s. The recent increase may coincide with harvest restrictions that were implemented in the U.S. in 1983 (Longcore et al. 2000).

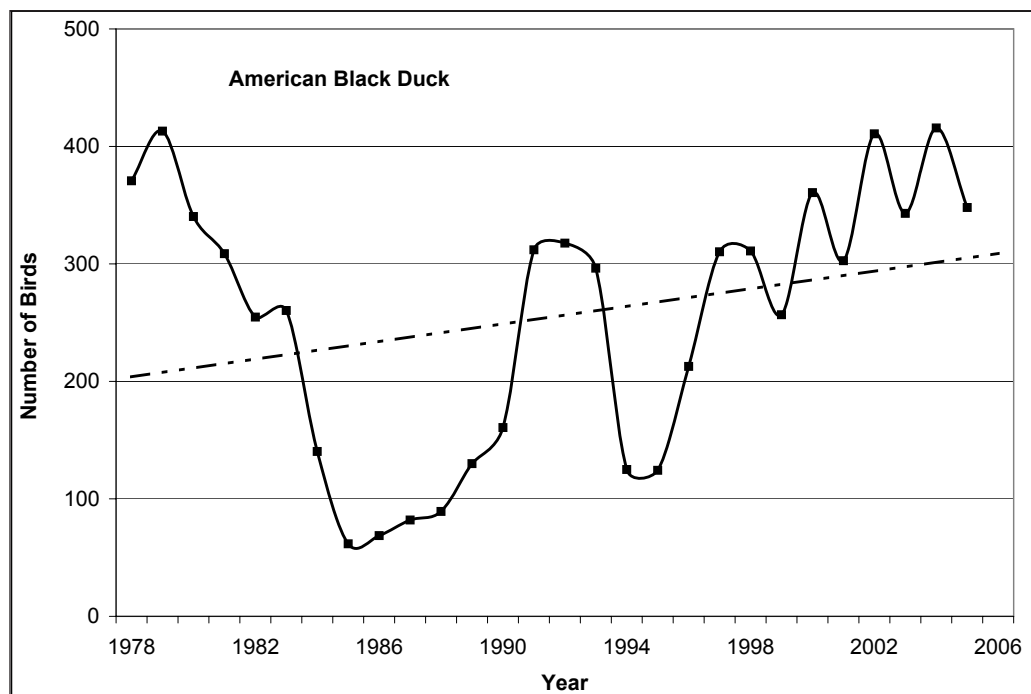


Figure 4. American black duck Rockwood Christmas Bird Count trend displaying 3-year moving averages, 1978-2005.

Since competition with mallards has been implicated in black duck declines, a comparison of relative abundance between black ducks and mallards was examined (Figure 5), a technique suggested by Bock and Root (1981). For nearly the last 20 years, the ratio has remained fairly stable, at roughly 1:17, despite a significantly positive trend in the numbers of mallards. Confounding evaluation of these two species, however, is the difficulty of distinguishing many of the hybrids (Figure 6). It has been estimated that 5 to over 13 percent of birds that look like black ducks in North America are actually hybrids (Longcore et al. 2000; Wright and Wyndham 2005), although this is not reflected in the Rockwood CBC numbers where virtually no hybrids are ever reported. Thus, these numbers should be viewed with caution.

The mute swan and Canada goose population data from the Detroit River CBC (see “Detroit River Christmas Bird Count” indicator) is very similar to the Rockwood CBC, in that both have increased by approximately 16% and 14%, respectively (Petrie and Francis 2003; MDNR 2001).

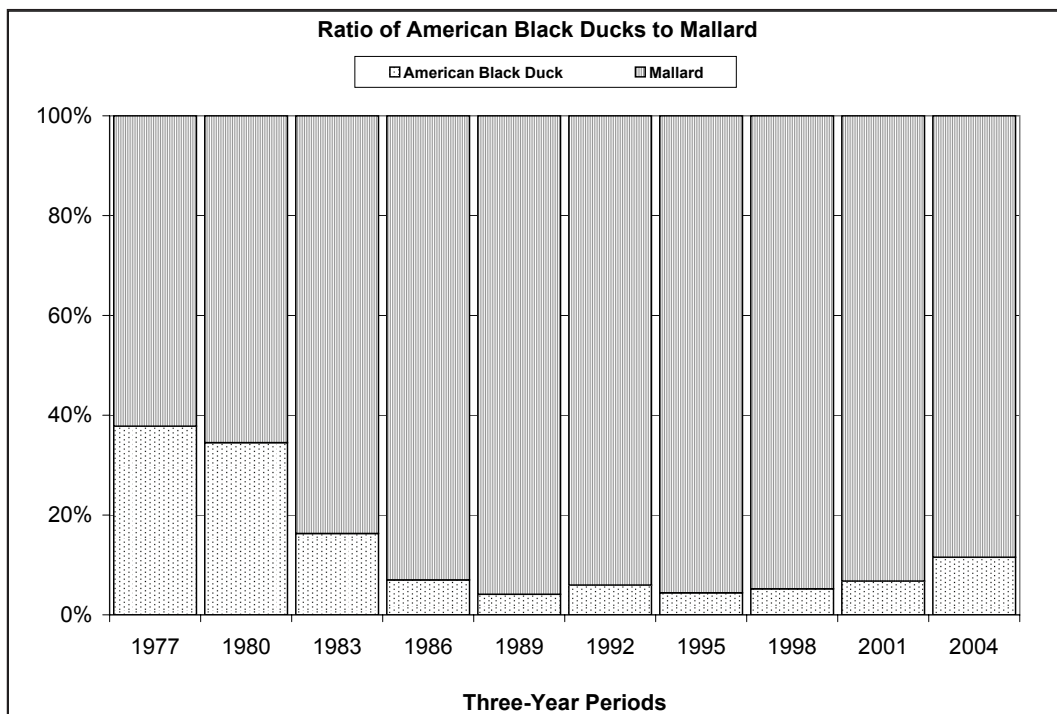


Figure 5. Ratio of American black ducks to mallards in the Rockwood Christmas Bird Count, 1977-2004.



Figure 6. A hybrid mallard and American black duck (Photo credit: Jack Illingworth).

Management Next Steps

Managers should continue to use CBC data to improve management strategies of American crow, American black duck, mallard, Canada goose, and mute swan populations. Control measures could be initiated as necessary with aggressive “nuisance” species, such as the mute swan. Waterfowl hunting limits must correlate with reproductive success and management of breeding habitats to ensure increasing reproductive success of native species.

Research/Monitoring Needs

The annual Rockwood Christmas Bird Count should be continued. In the future, counts need to consistently cover the same areas within the count circle yearly, with the same number of count hours expended by volunteers for consistency. Increased volunteer education and participation will be essential.

It is important to keep accurate count records, using GPS units to determine accurate observation locations, as well as accurately logged time and distance traveled. Feeder-watching efforts and waterfowl survey efforts and counts should be recorded separately. Feeder-watchers should also be given literature and training to aid in identifying species. Habitat changes in the circle over time should be recorded. Average weather conditions for the week and month preceding the count day should also be recorded because of factors that may affect waterfowl counts. Clearly, more participants need to be recruited to improve accuracy and utility of these CBC data.

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Links for More Information

Rouge River Bird Observatory: www.rrbo.org

University of Michigan, Animal Diversity Web, American crow: http://animaldiversity.ummz.umich.edu/site/accounts/information/Corvus_brachyrhynchos.html

Contact Information

Julie A. Craves
Rouge River Bird Observatory
University of Michigan-Dearborn
E-mail Address: jcraves@umd.umich.edu