

of trails covered by foot and 42 km of roads covered by automobile. Half of the 10-hour census day was spent in forests bordering the east and west banks of the Des Plaines River between the Illinois 68 and US 12 highway bridges. These Cook County Forest Preserve District old-growth woodlands remained unaltered through the years of the study.

The remaining half of the census day was spent among weedy fields, farm croplands, and developed lands situated west of the riparian woodlands. The weedy fields were located along drainage ditches and in power-line corridors. Mowing and removal of woody vegetation maintained the weedy fields through the duration of the study. However, the croplands that originally surrounded the weedy fields in 1964 were gone by 2001, having been gradually replaced by home subdivisions, apartment complexes, office parks, retail centers, and industrial parks.

In order to distinguish changes in bird populations through the years of the study, the counts of the 18 censuses completed during the period 1964-1983 were compared with those of the 18 censuses held during the period 1984-2001. A *t*-test was used to identify species whose average population numbers differed significantly ($P < 0.05$) between the two periods.

Results and Discussion

The average number of species recorded during the census was 290. The total number of species identified during the study was 74. Fourteen of these species had significantly different average counts between the 1964-1983 and 1984-2001 periods (Table 1).

Urbanization likely caused most of the population changes recorded during the study. Populations of species dependent on croplands as winter feeding grounds, e.g. Ring-necked Pheasant (Johnsgard 1999), Horned Lark (Askins 2000), and

Common Grackle (Peer and Bollinger 1997), declined as the farms disappeared. Unlike the croplands, the wooded areas and weedy fields remained unchanged along the census route, but residential growth occurring in their proximity likely contributed to changes in their bird populations. With increased human habitations there was a concomitant increase in bird feeders. The extra food supplied by bird-feeding may have spurred increased abundance of species that frequent feeders, e.g. Black-capped Chickadee, White-breasted Nuthatch, Red-bellied Woodpecker, American Goldfinch, and White-throated Sparrow (Brittingham and Temple 1988; Pravosudov and Grubb 1993; Shackelford et al. 2000; Peterjohn 2001).

Winter population increases of Sharp-shinned and Cooper's Hawks also may have been related to a growth in backyard feeders, as bird feeding increases the availability of the hawks' avian prey (Duncan 1996; Peterjohn 2001). Federal

restrictions on pesticide use probably contributed to their increases as well, since the populations of these two accipiters have been increasing nationally (Rosenfield and Bielefeldt 1993; Bildstein and Meyer 2000). The Red-tailed Hawk's population growth, and possibly that of the Sharp-shinned and Cooper's Hawks, may have been at least partly due to a reduction in raptor shootings as farmlands were covered by new buildings and parking lots. Population increases of the Red-tailed Hawk in North American urbanizing regions have been attributed to the species' growing tolerance of human activity in developed areas where it is infrequently harassed by people (Bechard et al. 1990; Stout et al. 1996).

Canada Goose populations have become established in Greater Chicago and other eastern metropolitan regions as lakes have been constructed in urban areas where there is minimal hunting (Conover and Chasko 1985). House Finch populations also have expanded in eastern North America since their release in New York about 1940 (Elliot and Arbib 1953). House Finches first appeared along the census route in 1992 and were recorded thereafter during 8 of the remaining 9 years of the study.

The Great Blue Heron was first seen along unfrozen sections of the Des Plaines River in 1992 and was again observed during 4 of the subsequent 9 years of the census. Warmer temperatures likely contributed to the increasing winter presence of the heron in the Chicago area (Carpenter and Greenberg 1999). Warming winter temperatures during the years of this study (Dunn 2001) perhaps also allowed more individuals of other species to overwinter near the northern edge of their traditional winter ranges, e.g. White-throated Sparrow, American Goldfinch, and Sharp-shinned, Cooper's and Red-tailed Hawks.



American Crows mob a Cooper's Hawk at Montrose Harbor, Cook County. American Crow numbers have remained stable over 38 years in the same Christmas Bird Count route in Cook County, Illinois, but Cooper's Hawks numbers have dramatically increased. Photo taken 21 October 2003 by Kanae Hirabayashi.