

WISCONSIN ENDANGERED RESOURCES REPORT 21

Changes in the Status and Distribution of Wisconsin
Double-crested Cormorants, 1973-85: Resurgence and
Recovery of a State Endangered Species

by Sumner W. Matteson

SUMMARY

The Wisconsin double-crested cormorant nesting population has increased from 66 pairs (3 colonies) in 1973 to 2,217 nesting pairs (22 colonies in 14 counties) in 1985. This increase amounts to an average annual growth rate of about 38%. Young production, though underestimated, has ranged from 0.86 to 1.66 with an overall mean of 1.22 young per nesting pair. Cormorant nesting populations have recovered from pesticide contamination, human persecution, and habitat loss. Probable major factors responsible for the cormorant recovery include a relative decline in DDE levels since the late 1960s, recruitment, immigration, the installation of artificial nesting platforms at selected sites (794 at 11 sites; 57% of available platforms used in 1985), and increased legal protection coupled with an educational campaign to inform the public about the status of the species. Despite the recovery, recent incidences of crossed bills and other gross physical abnormalities in Lake Michigan cormorants and other colonial waterbirds raise concerns about future reproductive impairments associated with microcontaminants. Also, increasing use of pound nets by cormorants in Lakes Superior and Michigan may prove intolerable to commercial fishermen who may decide depredation permits and abatement techniques are insufficient for controlling this species, once it is delisted.

Recommendations include: 1) annual monitoring of known colony sites to assess changes in nesting numbers and productivity; 2) periodic maintenance of nesting platforms and installation of new platforms if feasible; 3) listing the species as threatened if the statewide nesting population falls below 500 pairs for 3 consecutive years; 4) researching and utilizing appropriate abatement techniques prior to consideration of other control measures; and 5) periodically collecting a sample of eggs and deformed young from selected colonies for contaminant analyses.

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A Report to the Wisconsin Natural Resources Board
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Abstract

From the early 1920s to the mid-1960s nesting double-crested cormorants (*Phalacrocorax auritus*) occupied a total of 17 known colony sites in 16 counties, though apparently no more than 7 colony sites were active during a single breeding season. The total number of nesting pairs statewide reached at least several hundred in peak years. Between the mid-1950s and early 1970s habitat loss and deterioration, human disturbance, and pesticide contamination combined to threaten the species with extirpation from the state. The double-crested cormorant was listed as a state endangered species in 1972. In 1973 only 66 known pairs occupied 3 colony sites. During 1973-85 the nesting population increased dramatically to 2,217 pairs at 22 colony sites in 14 counties. In 1982 the state status of the double-crested cormorant was officially changed to "threatened." It is recommended now that the double-crested cormorant be deleted from the Wisconsin Threatened Species List.

Methods

Field data on colony sizes and productivity during 1973-85 were recorded by Bureau of Endangered Resources staff, DNR wildlife managers, U.S. Fish and Wildlife Service personnel, University of Wisconsin biologists, and private researchers. As a rule estimates of nesting pairs were based on the highest number of active nests counted during a single visit (Milton and Austin-Smith 1983), although for frequently visited colonies the maximum number of nests maintained at any one time provided an estimate of the minimum number of nesting pairs present (Postupalsky 1978). Nest counts usually occurred during the peak of the nesting season, which varied from late May to mid-June. Not all active colonies were censused annually. Population estimates during 1973-85 nevertheless provide an index to the magnitude of population changes. Estimates of numbers of young fledged from all colonies were incomplete each year and as represented are underestimates for annual net production statewide. Young included in productivity estimates were age 3 weeks or older, or were observed flying.

Results and Discussion

Wisconsin's nesting double-crested cormorant population has experienced a resurgence twice during this century. First, between 1920 and the mid-1950s and more recently between the early 1973 and 1985. Data prior to the early 1970s is scant so that the actual peak number of nesting pairs is highly speculative.

The first resurgence occurred in response to protection from extensive market gunning, which was especially prevalent in the 1880s and 1890s. There are no published reports of cormorants nesting in Wisconsin during the first 19 years of this century (Matteson 1983). From 1920 to 1966 cormorants colonized a total of 17 different sites in central and northeastern Wisconsin, though apparently no more than 7 sites were active during a single breeding season. Observations of several thousand migrants were common during the spring and fall in the 1940s and early 1950s (Anderson and Hamerstrom 1967).

Three factors contributed to the species subsequent demise: 1) long-term habitat deterioration in the form of tree losses and stand thinning; 2) renewed human persecution, especially unsanctioned control measures undertaken by commercial fishermen off the Door County Peninsula in northeastern Wisconsin (Nest trees, ground nests, eggs, and young were destroyed because fishermen believed cormorants frequenting pound nets and other nets posed a serious threat to their livelihood. In central Wisconsin illicit cormorant shoots became popular.); and 3) reproductive failures associated with the effects of chlorinated hydrocarbon residues, particularly DDT (dichlorodiphenyltrichloroethane) and its metabolites DDE (dichlorodiphenyldichloroethylene) and DDD (dichlorodiphenyldichloroethane) (Anderson and Hamerstrom 1967, Anderson et al. 1969, Postupalsky 1971, 1978, Matteson 1983).

By 1966 only 3 colony sites with a total of 24 nesting pairs were known to be active (Anderson and Hamerstrom 1967). In 1972 the double-crested cormorant was officially designated a state endangered species. In 1973 a statewide survey conducted by Postupalsky and Sindelar (BER files) revealed that only 66 nesting pairs occupied 3 colony sites in central, south central, and northwestern Wisconsin (Figure 1): Grand River Marsh Wildlife Area (WLA), Mead WLA, and Crex Meadows WLA. An encouraging sign, however, was that 2 of 3 colonies active in 1966 were still active in 1973 and had grown in size. In northwestern Wisconsin the Crex Meadows colony grew from 7 to 23 nesting pairs and at the Mead WLA the number of nesting pairs increased from 5 to 20. At a colony closely associated with Mead WLA (Lac DuBay) there were 300 nesting pairs in 1949 before the colony's gradual decline. A review of the species' changing status and distribution is provided in Figures 1-5, representing 3-year intervals from 1973 through 1985.

By 1976 there were 4 new colony sites. The Crex Meadows colony was no longer active; instead nesting cormorants apparently relocated to the Fish Lake WLA in southwestern Burnett County. For the first time in nearly 28 years nesting cormorants returned to island sites off the Door County peninsula. And for the first time in 35 years cormorants nested in the Wisconsin waters of the Mississippi River at what is now the Trempealeau National Wildlife Refuge. The total number of nesting pairs in 1976: 128 in 6 colonies (Figure 2).

By 1979 the number of nesting pairs statewide increased to 435 at 9 colony sites (Figure 3). For the first time in 21 years cormorants nested in the Wisconsin waters of Lake Superior: a colony of 17 pairs became established in 1978 on Gull Island of the Apostle Islands (Stanley Temple, pers. comm.) and increased to 41 nesting pairs in 1979 (Matteson 1979).

By 1982, 5 more colonies had emerged in central Wisconsin alone. There were also a total of 5 colonies in Lake Michigan waters. The state's nesting population stood at 1,028 pairs in 16 colonies (Figure 4). Due to the species apparent comeback its official state status changed from "endangered" to "threatened." By 1985 the state's nesting population had reached 2,217 in 22 colonies, with additional colonies appearing in Green Bay, off the Door County peninsula, on the Mississippi River, in the Apostle Islands, and in central, north central, and northwestern Wisconsin (Figure 5 and Table 1).

Since 1973 the state's nesting population has experienced an average annual growth rate of about 38%. This trend is represented by Figure 6. A comparison of the distribution of colonies in 1973 and 1985 is presented in Figure 7.

Natural groupings of colonies in 1985 can be associated with major lakes, rivers, watersheds, and wetlands (Figure 8): 51% of the nesting population occurred in Green Bay and in Lake Michigan waters off the Door County peninsula; 19% occurred near the Wisconsin River and associated areas; 14% occurred in the Apostle Islands; 10% occupied sites in or near Horicon Marsh and Grand River Marsh area; and the remaining 6% colonized sites on or not far from the Mississippi and St. Croix rivers.

Statewide, young production during 12 years of the 13-year period, though incomplete and conservatively estimated for most colonies, ranged annually from a mean of 0.86 to 1.66 young per pair, with an overall mean of 1.22 young per nesting pair. Dunn (1975) reported that annual productivity of 1-2 young per pair was necessary to maintain cormorant population stability.

Increases in the state's double-crested cormorant nesting population between 1973 and 1985 statistically fits both exponential and sigmoidal or logistic growth models (Mike Staggs, pers. comm.). Fitted to the logistic model (Figure 9), extrapolation of the nesting data projects Wisconsin's population stabilizing at ca. 3,249 nesting pairs by 1995. This assumes that certain parameters, such as recruitment rates, remain constant. Density dependent factors, such as competition with great blue herons and gull species for nesting sites, and limited food resources and nesting habitat, theoretically will assert themselves around 1990.

The largest body of nesting data comes from the Mead WLA in central Wisconsin, where active management has been largely responsible for increases in nesting pairs since 1974. The Mead WLA is 26,610 acres in size, with 17 large impoundments created principally for waterfowl management (Meier 1981). Cormorants have occupied two flowages: Berkahn Flowage and Teal Flowage. The number of pairs at Mead increased from 20 in 1974 to a peak of 429 in 1984. Mean fledging rates have ranged from 1.27 to 2.85 young per pair (Table 2).

