

# BREEDING COLONIES OF DOUBLE-CRESTED CORMORANTS AND GREAT BLUE HERONS ON LAKE FRANCIS CASE DURING THE SUMMER OF 1978

G. Blankespoor, S. Archer, D. Ode.

Among the more striking of South Dakota's breeding birds are the Great Blue Heron and the Double-crested Cormorant. Contributing to the inherent interest of these species is their relatively large size and the fact that they are colonial nesters. The natural history of these species has been adequately reviewed by Palmer (1962). Briefly, the Great Blue Heron breeds across most of North America almost always in the immediate vicinity of water. Preferred nesting sites are in the tops of tall trees, although nests in low vegetation and even on the ground surface have been reported. Great Blue Herons utilize both live trees and dead trees (snags) as nesting sites. The Double-crested Cormorant has its largest breeding populations along both the Atlantic and Pacific coasts but is also well represented inland, utilizing a variety of freshwater habitats. Cormorants also nest commonly in live and dead trees but are frequently found breeding on barren, rocky islands in larger lakes. Mixed colonies of Great Blue Herons and Double-crested Cormorants are not at all uncommon.

About ten years ago Adolphson and Adolphson (1968) provided a rather complete survey of three colony-nesting species in South Dakota. Among the species they considered were the Double-crested Cormorant and the Great Blue Heron. They reported that the cormorant was a common resident throughout the state. In support of this contention they cited the existence of 36 known colonies on the lakes and rivers of the state and estimated that there were 5000 breeding pairs. The Adolphsons described the Great Blue Heron as a common summer resident of the state and indicated that there were known colonies of this species. Most of

these colonies were located along the drainages of the Missouri and James Rivers, but the Adolphsons did not include precise descriptions of colony locations in their report.

In this note our basic purpose is to report on nesting colonies of Great Blue Herons and Double-crested Cormorants which occurred on Lake Francis Case during the summer of 1978. We have also tried to assess the importance of these colonies within the wider context of state-wide breeding populations of these species.

## METHODS

Information about cormorant and heron colonies was collected during the summer of 1978 as part of an ecological and archaeological reconnaissance of the east bank of Lake Francis Case. The project was made possible by the U.S. Army Corps of Engineers through the Augustana College Research Institute. The survey was conducted by canoe, and the area covered extended north from the Fort Randall Dam at Pickstown to the tail waters of the Big Bend Dam near Fort Thompson. Since we made our way north along the east side of the lake, it was not possible to determine whether colonies existed in the bays which extend westward from the west side of the lake.

All colonies were inventoried in the afternoon on clear, hot, calm days. One pass was made through each colony, during which the number of birds in each nest was recorded. Birds in flight in the colony vicinity and birds perched on trees without nests were not counted. No distinction was made between adult and juvenile individuals.

*SOUTH DAKOTA BIRD NOTES*

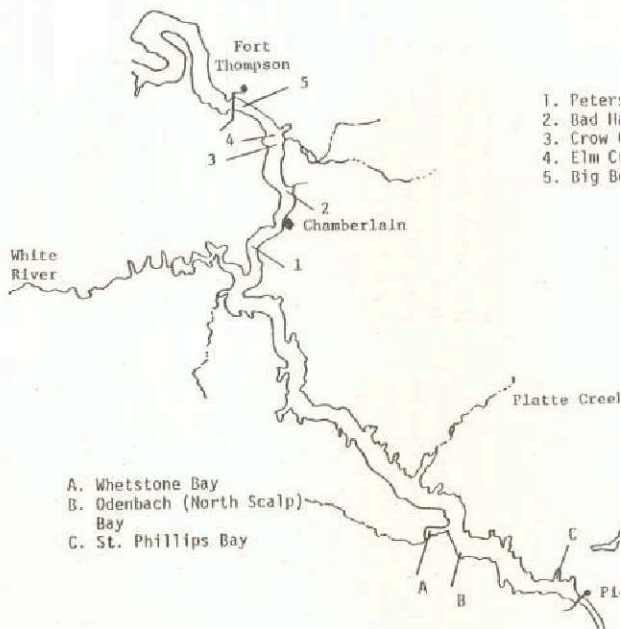


FIGURE 1. Locations of Great Blue Heron and Double-crested Cormorant colonies cis Case during the years 1965-1970 (A-C) and during the summer of 1978 (1-5), were reported by Town (1970).

## RESULTS AND DISCUSSION

Five nesting colonies were recorded during the survey; their precise locations are given in Figure 1. In every case nests were located in dead trees (snags) standing in the water. Cormorants breeding elsewhere in South Dakota also nest in dead trees (Greichus and Greichus, 1973). It is interesting to note that all of the colonies were located in the upper portions of Lake Francis Case. This undoubtedly reflects the fact that as one goes north along the lake (into increasingly shallow water) the number of standing dead trees increases. The largest, single colony was situated in the tailwaters immediately below Big Bend Dam. Dead trees and snags were abundant, and the shallow, clear, nutrient-rich waters likely provided an abundance of food resources.

Results of the nesting colony inventory are presented in Table 1. The data can be summarized as follows: (1) of 181 total nests in the five colonies, 63 or 34.8% were inactive; (2) of the 118 active nests, 33 or 23.0% were those of Great Blue Herons; (3) the colony at Elm Creek had no nesting herons; (4) for both species there was an average of 2.08 birds on the nest at the time of the inventory.

In an effort to assess the relative contribution the Lake Francis Case colonies make to the total picture of breeding Great Blue Herons and Double-crested Cormorants in the state of South Dakota, we accumulated reports of breeding colonies from several sources. Most of these reports were gleaned from *South Dakota Bird Notes*. Additional reports came from a James River study by Schneider (1978) and from the present study. The geographical locations of reported breeding colonies are presented in Figure 2. It should be noted that each location was entered into the figure only once, though more than one breeding report was filed for some locations.

Figure 2 permits one to generalize that most of the breeding Double-crested Cormorant colonies in the state have occurred in the northeast lake region and along the Missouri and James Rivers. The same is true for Great Blue Herons, except that this species also has had breeding colonies in the Black Hills. The figure also indicates that at least at the present time, the Lake Francis Case colonies of both species make an important contribution to state-wide breeding populations. Although the majority of heron and cormorant colonies are located on Lake Francis Case, it is likely that systematic surveys of Lake Sharpe and Lake Oahe would reveal the existence of additional colonies.

Since the Lake Francis Case colonies occur in emergent dead trees, the prognosis for the future of these colonies is not good. It is certain that as time continues these dead trees will gradually disappear and along with them the heron and cormorant colonies they support. Vermeer (1969) attributed the loss of three Great Blue Heron breeding colonies in Canada to nesting tree decay. This may have already happened in lower Lake Francis Case. Town (1970) reported nesting colonies at St. Phillips, Odenbach, and Whetstone Bays. In the present study no colonies were observed in these parts of the reservoir, although the latter two bays were on the west bank and conceivably could have supported colonies not detected in this survey.

The future breeding status of these two species on a state-wide basis is not easily predicted. Intuitively, one would suppose that both the species are greatly threatened by such things as persistent pesticides, increased home building along lake shores and increased accessibility of isolated, remote areas. The assumption that large, wading birds are susceptible to influences of this sort is the basis for a recent effort to use east coast wading birds as biological indicators (Custer and Osborn 1977). Larson's (1925) report that the Great Blue



Heron was a summer resident along the river (Big Sioux) and creeks of Minnehaha County seems to imply that such influences have had their effect in South Dakota. Similarly, Green and Janssen (1975) indicate that although cormorants once bred in all regions of Minnesota, today active colonies occur at only the large lakes of the west central region. Ellison and Cleary (1978) recently demonstrated that human disturbance did have a negative effect on breeding of Double-crested Cormorants in the St. Lawrence Estuary.

On the other hand, there is little evidence to support the contention that numbers of breeding individuals have declined in the state in recent years. It may be that both species have become adapted to breed in close proximity to human beings and their appurtenances. Populations of both species appear to be thriving in other states as well. Palmer (1962) reports that although Double-crested Cormorants decreased steadily with advancing civilization until the year 1935, since that time they have managed to re-establish themselves in many areas from which they had been absent for many years. Likewise, eight of nine east coast colonies of Great Blue Herons had more breeding pairs in 1975 than they did in 1973. (Custer and Osborn, 1977).

Although populations may be holding their own in many places, it seems reasonable to suppose that man will become an increasing threat to the welfare of these species, probably in large part through the destruction of suitable nesting habitat. Unfortunately, the prevalent but inaccurate notion that cormorants consume large numbers of game fish (Ross, 1974/1976) may interfere with efforts to promote the welfare of this species.

In the interest of a possible future need to manage these species, it is important that as many breeding colonies as possible be located and monitored.

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### References

- Adolphson, D.G. and M. Adolphson. 1968. Size, distribution and populations of three colony nesting species in South Dakota. S. Dak. Bird Notes 20:4-10.
- Custer, T.W. and R.G. Osborn. 1977. Wading birds as biological indicators: 1975 colony survey. U.S. Fish Wildl. Serv. Sci. Rep. --Wildlife No. 206, Washington, D.C.
- Ellison, L.N. and L. Cleary. 1978. Effects of human disturbance on breeding of Double-crested Cormorants. Auk 95:510-517.
- Green, J.C. and R.B. Janssen. 1975. Minnesota Birds: Where, When, and How Many. U. of Minn. Press, Minneapolis.
- Greichus, A. and Y.A. Greichus. 1973. Some factors affecting the nesting success of pelicans and cormorants in South Dakota. Proc. S. Dak. Acad. Sci. 52:241-247
- Larson, A. 1925. The birds of Sioux Falls, South Dakota, and vicinity. Wilson Bull. 37:18-38 and 72-76.
- Palmer, R.S. 1962. Handbook of North American Birds, Vol. 1. Yale University Press.
- Ross, R.K. 1974/1976. A comparison of the feeding and nesting requirements of the Great Cormorant (*Phalacrocorax carbo* L.) and Double-crested Cormorant (*P. auritus* Lesson) in Nova Scotia. Proc. N. S. Inst. Sci. 27:114-132.
- Schneider, L.P. 1978. Wildlife habitat in the James River Valley, South Dakota. Master's Thesis. South Dakota State University. Brookings, South Dakota.
- Town, R.H. 1970. Bird observations on Lake Francis Case (Randall Reservoir), South Dakota, 1965-1970. S. Dak. Bird Notes 22:94-95 & 106.
- Vermeer, K. 1969. Great Blue Heron colonies in Alberta. Can. Field Nat. 83:237-241.



PHOTOGRAPH. Great Blue Heron and Double-crested Cormorants breeding at Big Bend Dam in 1978. Photo by Steve Archer.