

# 1982 CENSUS OF SASKATCHEWAN WHITE PELICAN AND DOUBLE-CRESTED CORMORANT COLONIES

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The Saskatchewan Museum of Natural History undertook a censusing program designed to determine and monitor the status of the pelican and cormorant colonies in Saskatchewan, continuing the work of Vermeer and Boeker.<sup>9 2</sup> The program also set out to provide additional protection and management for the breeding colonies of these two species. The first census was conducted in 1976 with subsequent censuses being carried out every two years. In 1976, a ground nest census was conducted, while the following censuses employed an aerial photographic technique that is highly reliable and has the added desirability of eliminating harmful disturbance to the colony particularly during the critical incubating period.<sup>4 5 6</sup>

In 1982, White Pelican and Double-crested Cormorant nest census was conducted through the combined efforts of the Saskatchewan Museum of Natural History (SMNH), Saskatchewan Parks and Renewable Resources (SPRR), and the Canadian Wildlife Service (CWS). 1982 was also the final year the Saskatchewan Museum of Natural History was directly responsible for this census. In the future S.P.R.R. will conduct the program with assistance from other agencies.

Ten pelican and twenty-four cormorant colonies were censused with a total of 15,480 and 10,971 nests

counted respectively. The number of pelican nests was similar to the 15,427 recorded in 1980 however, the number of islands being utilized decreased by two, from 12 to 10. The number of cormorant nests increased from the 7,410 and the nesting sites increased from the 17 recorded in 1980.

## Methods

During the peak incubating period from 31 May to 5 June 1982 aerial censuses were flown to determine the number of White Pelican and Double-crested Cormorant nests in Saskatchewan. Censuses were flown at an altitude of 200 m and census times ranged from 0615 to 1025 hours and 1515 to 1700 hours. These census times were chosen to avoid the midday period when the major nest relief of incubating adults is reported to occur and to eliminate to a great degree, counting non-incubating birds.<sup>7 3</sup> One colony was censused during the critical midday period. The South Saskatchewan River cormorant colony was flown at 1256 hours, however the problem of discerning between incubating and non-incubating birds was not considered to be a factor in this case since the colony is small, consisting of only two nests located in trees.

Color transparencies (Kodachrome 64) were taken of the colonies using a hand held Pentax KX 35 mm camera with a 200 mm telephoto lens. The

number of nests in each colony was determined by counting the number of incubating adults while viewing the slides under a stereo microscope and while projecting them onto a screen.

## Results

Ten active White Pelican colonies situated on nine lakes were censused in 1982 (Primrose Lake contained two pelican nesting islands). The pelicans nested within the same water bodies in 1982 as they did in 1980 but occupied two fewer nesting islands. One island was abandoned in each of Mud (Middle Quill) and Primrose Lakes.

A total of 15,480 nests were counted in 1982 (Table 1), an increase of 53 nests over the 1980 census when 15,427 nests were reported.<sup>6</sup> While the breeding population has remained stable between the two censuses, significant changes have occurred in the number of nests in specific colonies. The number of nests increased at Primrose Lake from 4,834 in 1980 to 6,822 in 1982 (+48%) and at Redberry

Lake from 168 to 240, a 43% increase, in the same period. In the remaining eight colonies fewer nests were counted in 1982 than had been reported in 1980. The declines in the numbers of nests recorded in each colony between the two years were as follows: Mud Lake, -218 nests, from 655 in 1980 to 437 in 1982 (-33%); Lenore Lake, -68 nests, 110 to 42 (-62%); Lavallee Lake, -221 nests, 3,790 to 3,569 (-6%); Kazan Lake, -159 nests, 768 to 609 (-21%); Preston Lake, -180 nests, 275 to 95 (-65%); Old Wives Lake, -458 nests, 3,075 to 2,617 (-15%), and Suggi Lake, -703 nests, 1,752 to 1,049 (-40%).

Twenty-six cormorant colonies, 24 of which were active and two of which were inactive, were censused in 1982. Of the 24 active colonies, five were first located and censused in 1982; three in Churchill Lake and two in Last Mountain Lake. In Churchill Lake, cormorants nested on one island in 1978, abandoned it in 1980, and nested again in 1982 at which time they established nests on an additional three



*White Pelicans at Last Mountain lake*

*G.L. Holroyd*

islands. Other colonies recently located and investigated are as follows: the Alkali Lake colony was reported in 1980 (Phil Browne, pers. comm.) when 20 nesting pairs were counted. It was checked in 1981 by Saskatchewan Parks and Renewable Resources personnel who recorded 40 nests (Syd Barber, pers. comm.). The South Saskatchewan River colony was first reported in 1980 (Cam Scheelhaase, pers. comm.) but not investigated until 1982.

One of the inactive cormorant colonies was located on an island in an unnamed lake 8 km south and 1.6 km east of Khedive. This colony had at

some time contained 60 nests but had since deserted. The other inactive colony was located on Montague Lake which was known to have contained 11 active nests on June 9, 1981 but which was found abandoned on a subsequent check on July 15, 1981. In addition to these colonies one nesting island located in Mud Lake was found to have been abandoned since the 1980 census when two islands were utilized as nesting sites at that location.

The total number of cormorant nests counted in 1982 was 10,971 (Table 1), an increase of 3,561 nests (48%) over the 1980 nest census.<sup>6</sup>

Table 1. NEST CENSUS OF PELICAN AND CORMORANT COLONIES

<i>Location</i>	<i>Date</i>	<i>Census Time</i>	<i>Pelican Nests</i>	<i>Cormorant Nests</i>
Mud Lake (Middle Quill)	May 31	0755	437	27
Lenore Lake	May 31	0830	42	651
Last Mt. Lake	May 31	0915	—	1202(4) <sup>a</sup>
Unnamed Lake (Khedive) <sup>b</sup>	June 1	0800	—	—
Alkali Lake <sup>c</sup>	June 1	0820	—	15
Montague Lake <sup>d</sup>	June 1	0855	—	—
Old Wives Lake	June 1	0905	2617	147
Reed Lake	June 1	0935	—	141
Cypress Lake	June 1	1025	—	329
South Sask. River <sup>e</sup>	June 1	1256	—	2
Redberry Lake	June 1	1700	240	53
Suggi Lake	June 3	0725	1049	1666(2)
Lavallee Lake	June 3	1010	3569	899
Dore Lake	June 3	1515	—	1464(2)
Churchill Lake	June 4	0615	—	790(4)
Preston Lake	June 4	0722	95	—
Kazan Lake	June 5	0810	609	2544
Primrose Lake	June 5	0950	6822(2)	1041(2)
TOTAL			15,480(10)	10,971(24)

a — Indicates number of nesting islands, if more than one.

b — Abandoned cormorant colony located during census, 8 km south and 1.6 km east of Khedive (60 deserted nests)

c — First reported in 1980 (20 nesting pairs); censused by SPRR on 16 June 1981 (40 nests)

d — Cormorant colony located on 9 June 1981 (11 nests); found abandoned when checked again on 15 July 1982

e — Reported nesting 21 July 1980

Fifteen water bodies were utilized as nesting locations in 1982 of which 12 had also been used in 1980. Comparing the number of nests recorded in 1980 and 1982 at these twelve locations, the colonies at Old Wives, Mud, and Lenore Lakes are seen to have declined in nests counted while the nest counts increased at the remaining nine locations.

The Old Wives Lake colony dropped by 546 nests, from 693 in 1980 to 147 in 1982 (-79%); Mud Lake, -48 nests, from 75 to 27 (-64%); and Lenore Lake, -19 nests, from 670 to 651 (-3%).

Large increases in the numbers of nests recorded occurred at Suggi Lake, +513 nests, from 1,153 to 1,666 (+44%); Kazan Lake, +957 nests, from 1,587 to 2,544 (+60%); Primrose Lake, +582 nests, from 459 to 1,041 (+127%); Last Mountain Lake, +413 nests, from 789 to 1,202 (+52%); Reed Lake, +79 nests, from 62 to 141 (+127%); and Dore Lake, +615 nests, from 849 to 1,464 (+72%). Moderate increases in the number of nests were recorded at Lavallee Lake, +152 nests, from 747 to 899 (+20%); Redberry Lake, +10 nests,

from 43 to 53 (+23%); and Cypress Lake, +46 nests, from 283 to 329 (+16%).

## Discussion

The results of censuses conducted since 1976 indicate that the Saskatchewan breeding populations of White Pelicans and Double-crested Cormorants have increased in recent years (Table 2).<sup>4 5 6</sup>

To an undetermined degree this population increase is attributed to improved census techniques and more extensive censuses. The census method has evolved from a ground census in 1976, to aerial censuses conducted only during the morning (0600 to 1030 hours) in 1978 and 1980, to the present morning/afternoon aerial census. It is believed that the latter method produces the most accurate results given limited financial resources and the need to conduct the census in a relatively short time span in order to census all colonies during the peak incubation period. The flying of surveys in the afternoon was initiated in 1982 on the basis of the work of

Table 2. PELICAN AND CORMORANT NEST CENSUS RESULTS 1976 - 80

Location	1976		1978		1980	
	Pelican	Cormorant	Pelican	Cormorant	Pelican	Cormorant
Cypress Lake	—	320	—	395	—	283
Old Wives Lake	1420	319	3084	658	3075	693
Reed Lake	—	—	—	—	—	62
Lenore Lake	—	—	—	—	110	670
Last Mt. Lake	—	117	—	337	—	789
Mud Lake	138	267	232	72	655	75
Redberry Lake	89	29	72	24	168	43
Suggi Lake	325	220	913	579	1752	1153
Dore Lake	—	130	—	270	—	849
Lavallee Lake	1293 <sup>a</sup>	299 <sup>a</sup>	3019	651	3790	747
Primrose Lake	2313	43	4007	124	4496	459
Churchill Lake	—	—	—	104	—	—
Preston Lake	—	—	—	—	275	—
Kazan Lake	275	1300	952	753	768	1587
TOTAL	5,853	3,044	12,279	3,967	15,427	7,410

<sup>a</sup> - 1975 results

Beaver and Lewin who found that the number of loafing birds present at the nesting site declined during the day and was lowest in the late afternoon and evening.<sup>1</sup> They suggested that evening counts might be more accurate since fewer loafing birds are present at this time. The census method is also a compromise between the need for accuracy of nest counts and the need to limit the disturbance of the incubating birds. Such disturbance has two deleterious effects in that it exposes unprotected eggs to predation, and in the case of aerial censuses, reduces the researcher's ability to discriminate between those birds which are incubating and those which are not. Sidle and Ferguson took photographs of the White Pelican colony at Chase Lake, North Dakota, from altitudes of 70 and 137 m to obtain good image resolution.<sup>8</sup> They noted that flying at these heights did not appear to disturb the birds. Test flights over Saskatchewan colonies showed that the birds became excited and left their nests when censused at an altitude of 150 m thus requiring censuses to be conducted above this altitude. Photographs taken from this height were of sufficient clarity for reliable nest counts to be made. The difference in the above described responses of birds to overflights may be due to some habituation to human presence by the Chase Lake pelicans since this colony has been the subject of numerous studies.

Saskatchewan contains almost one-half of the total Canadian breeding population of White pelicans, 15,480 pairs nested in only 10 localities in 1982. The species colonial nesting habit makes the population vulnerable to significant losses should a natural catastrophe or human disturbance destroy one or more of the colonies. The effect would be especially severe if a major colony such as Primrose Lake, which in 1982 contained 6,822 nests or 44 percent of the total provin-

cial pelican nests, was destroyed. The large increase in the Primrose Lake colony enabled the total nest counts to remain similar in 1982 as in 1980 in spite of a decline in the number of nests for eight of the ten colonies. Why did the Primrose Lake colony experience such a large increase? Did this increase result from birds coming from the other colonies that suffered a loss? The whole question of movement of birds between colonies and colony fidelity has yet to be studied and fully understood and is an area where future work is required.

As a result of the censusing program since 1976, the status of the pelican and cormorant breeding population has been monitored, sensitive nesting areas where colonies may be subjected to disturbance have been identified, and management proposals providing added protection for the colonies have been recommended to SPRR. Through discussions with SPRR, regulations were drawn up of which many have now been legislated. The major regulations passed include the following:

1. All pelican nesting islands have been designated as Wildlife Refuges,
2. From the period 15 April to 15 September, no person shall enter or approach within 100 metres of the following refuges unless special permission is granted by the Director of Wildlife.
  - (a) Gatehouse Island Wildlife Refuge (Kazan Lake)
  - (b) Heglund Island Wildlife Refuge (Cypress Lake)
  - (c) Isle of Bays Wildlife Refuge (Old Wives Lake)
  - (d) Lenore Lake Wildlife Refuge
  - (e) Mud Lake Wildlife Refuge
  - (f) Primrose Lake Wildlife Refuge
  - (g) Preston Lake Wildlife Refuge
  - (h) Redberry Lake Wildlife Refuge
  - (i) Rock Island Wildlife Refuge (Doré Lake)

(j) Scheelhaase Island Wildlife Refuge (Suggi Lake)

In addition to the above pelican colonies protected, the cormorant colony at Cypress Lake and the Caspian Tern colony at Doré Lake are also included.

Public awareness and observance of these regulations will aid in reducing the amount of disturbance these colonies receive and will help in assuring the continued existence of these magnificent birds.

### Acknowledgements

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<sup>1</sup>BEAVER, R.D., and V. LEWIN, 1981. Scheduling censuses of breeding White Pelicans (*Pelecanus erythrorhynchos*) in Northern Alberta. *Canadian Field Naturalist* 95:198-201.

<sup>2</sup>BOEKER, E.L. 1972. A survey of White Pelican nesting colonies in 1971. *Am. Birds* 26:24-125.

<sup>3</sup>KNOFF, F.L. 1975. Spatial and temporal aspects of colonial nesting of the White Pelican, *Pelecanus erythrorhynchos*. Ph. D. thesis. Utah State Univ., Logan, Utah. 76 pp.

<sup>4</sup>RONEY, K. 1978. Pelicans, Cormorants and Great Blue Herons in Saskatchewan in 1976. *Blue Jay* 36:28-35.

<sup>5</sup>RONEY, K. 1979. Saskatchewan's Pelicans and Cormorants in 1978. *Blue Jay* 37:216-218.

<sup>6</sup>RONEY, K. 1982. 1980 Nest census of Saskatchewan's Pelican and Cormorant Colonies. *Blue Jay* 40:158-160.

<sup>7</sup>SCHALLER, G.B. 1964. Breeding biology of the White Pelican at Yellowstone Lake, Wyoming. *Condor* 66:3-23.

<sup>8</sup>SIDLE, J.G., and E.L. FERGUSON. 1982. White Pelican populations at Chase Lake, North Dakota, evaluated by aerial photography. *The Prairie Naturalist* 14:13-26.

<sup>9</sup>VERMEER, K. 1970. Colonies of Double-crested Cormorants and White Pelicans in Saskatchewan. *Canadian Field Naturalist* 84:39-42.

## RAPTOR COLLISIONS WITH UTILITY LINES

### A Call for Information

The U.S. Bureau of Land Management, Sacramento, in cooperation with the Pacific Gas and Electric Company, is assembling all available published and unpublished information concerning collisions of raptors with power lines and other utility lines. Actual case histories — no matter how circumstantial or fragmentary — are needed. Please acknowledge that you have such information by writing to Dr. Richard R. (Butch) Olendorff, U.S. Bureau of Land Management, 2800 Cottage Way, Sacramento, California 95825 U.S.A. (Phone (916) 484-4541). A form on which to record your information will be sent by return mail.