Sandhill Crane. Drawing by Norma J. Lipsett.

Sandhill Crane Studies In Michigan's Upper Peninsula

This population, possibly more so than the Grays Lake, Idaho, one, is a logical choice for cross-fostering attempts with Whooping Crane eggs.

LAWRENCE H. WALKINSHAW[1]

THE EARLIER SEARCHES

On 28 May 1934, Clara and I struck out for northern Michigan, hoping to learn more about the Greater Sandhill Crane (*Grus canadensis tabida*). We crossed the Straits by ferry and then drove to Newberry. The next day we got through a very sandy road to Whitefish Point, Chippewa County. Since the only possible rooming place was unavailable, we headed back across the same tricky road and reached Newberry again late that evening. Although I was outside pushing the car through much sand that day, we neither heard nor saw a Sandhill Crane.

From Newberry we drove to Blaney Park where we spent several days at T-Lake with Dr. Karl Christofferson. We searched the neighboring marshes and then later those around Seney and Germfask. Since most of these marshes were very dry we hiked one morning from Walsh 7 miles south along the Walsh Ditch to the "spreads" where the ditch formed several channels across a large marsh. There finally that 5th day of June, we found our first pair of Sandhill Cranes. Later when we observed another pair, these 4 birds constituted the only observations of Sandhill Cranes during 71 field hours in the Upper Peninsula. Since black flies and mosquitoes were so abundant and Clara proved allergic to their bites, she discontinued going to northern Michigan. Normally during later years, I searched alone. During early June 1935 I spent 91 hours in the field in the Upper Peninsula in which time only 4 more cranes were observed even though I was in prime habitat for the species, Chippewa, Luce and Schoolcraft counties. In 1937 I again visited the Seney-Germfask region, the then-new Seney National Wildlife Refuge. I drove through mud and water-covered roads where it was possible to operate a car. At various points, I hiked over miles and miles of bogs and open marsh, but most of the time was spent in sedge and cattail marshes. During 95 field hours in 1937 I observed 38 cranes. On 9 May 1937, working with Eugene Crawford, the biologist at Seney, we found north of Stutts Creek and just south of the Seney Refuge our first crane nest in the Upper Peninsula. Although I have spent many hours in the field since then, this has been the only nest

[1] I thank William Taylor, Biologist with the Hiawatha National Forest, his wife Char and my son Jim for all the help they gave me in recent years when we were searching for Sandhill Crane nests in the Upper Peninsula. And I hope that Bill will come out soon with the results of his work on the Hiawatha National Forest.

I ever found in a willow-dotted sedge marsh in the Upper Peninsula. Hoping to get some photographs, I built a blind near this nest but the birds deserted it. Crawford later collected the eggs for the refuge museum. This was my last attempt to photograph any cranes in that part of the state. Since then Cordia J. Henry (manager of the Seney National Refuge for many years) and William Taylor (biologist for the Hiawatha National Forest) have both photographed the birds at their nests.

During late May 1940 Clara and I went with the Bernard W. Bakers back to the Upper Peninsula. Our wives remained in the cabins while we searched mornings for cranes. We learned that there might be cranes around Betchler Lake, near Strongs, Chippewa County. Although we were chewed up unmercifully by mosquitoes and black flies we did find many cranes there. Later that same year, on 31 August and 1 September, I found there groups of 4, 3 and 2 cranes. On 5 May 1941 I found 16 more and 1 pair near Crego Lake behaved as though they had a nest but I could not find it. During early May 1943 I camped in the Betchler Lake region near Strongs. Bernard and Emily Baker, and Millard Vandervoort joined me for several days. Before they arrived I had found 3 crane nests near Betchler Lake and observed a number of cranes near Pullup Lake, northern Mackinac County (Fig. 1). After they arrived we found many cranes near Sleeper Lake, Luce County and a nest with 2 eggs. These were the early years of my Sandhill Crane work in Michigan's Upper Peninsula.

During the 1950's, the Powell Cottrilles, William A. Dyer, William R. Freeman, C. J. Henry and Josselyn Van Tyne worked with me at times. During the 1960's William R. Freeman and I worked together several times; during the 1970's William Taylor and my son Jim were with me at times. I have worked over every county in the Upper Peninsula but have found cranes only in Baraga, Marquette, Alger, Luce, Chippewa, Delta,

TABLE 1. Weights and measurements of newly hatched Sandhill Crane chicks (in grams and millimeters).

Trait	Lower Peninsula	Upper Peninsula
Number of birds	30	7
Weight	115.65 (99.0-125.6)	—
Wing (chord)*	35.5 (27.4-42.3)	34.07 (31-40)
Tarsus	44.2 (40-52)	39.37 (35-42)
Exposed culmen	24.2 (21-26.3)	22.4 (20-25)
Bare tibia	28.7 (20-30)	21.0 (20-22)
Middle toe with claw	33.6 (29-41)	31.0 (29-41)

*Wing measurements were taken from the bend to the tip of longest down.

Schoolcraft and Mackinac counties. Nests have been found in all but Marquette County. Since there has been a gradual increase in crane numbers since the 1930's, both cranes and nests are much easier to locate now.

After visiting the Whooping Crane (*Grus americana*) nesting grounds in Wood Buffalo Park, Northwest Territories, Canada, I became aware that these northern Michigan crane marshes resemble those occupied by the Whooping Crane in Canada more than any other region in the United States. To me it has always seemed the logical spot in the United States to cross-foster Whooping Crane eggs in Sandhill Crane nests. In northern Michigan most Sandhill Cranes nest in wilderness bogs. They roam in summer with their young through these bogs, along the shores of boggy lakes and on nearby treeless ridges. Nights are spent in the bogs where there is water. Both foxes and coyotes dislike getting their feet wet; they prefer working the dry ridges. These cranes also winter in Florida so that an ideal migration route is well established which is much shorter than the main Whooping Crane route between Northwest Territories and Aransas Refuge, Texas. After the young Whooping Cranes were "weaned" in Florida, they would have many choices for wintering: the great prairies, the coastal wildlife refuges or the Okefenokee Swamp, southern Georgia.

Nesting Habitat

Sandhill Cranes nest in both Michigan peninsulas. Those in southern Michigan almost invariably place their nests in shallow water in a marsh grown to grass, sedges, cattails, bulrush, loosestrife and similar plants.

FIG. 1. Sandhill Crane habitat between Pullup and Cranberry Lakes, Mackinac Co., 24 May 1952

Only one southern Michigan nest, and that was in Mason County, has been found in a sphagnum-leatherleaf bog. Southern Michigan marshes are much more alkaline, having a pH of 7.0 to 7.6 while the bogs in the Upper Peninsula have a pH as low as 4.5 at times. The predominant plants in the northern peninsula bogs have been sphagnum, some fine *Carex* sp., hare's tail cotton grass (*Eriophorum spissum*), arrow grass (*Scheuchzeria palustris*), leatherleaf (*Chamaedaphne calyculata*), bog laurel (*Kalmia polifolia*), Labrador tea (*Ledum groenlandicum*), and bog rosemary (*Andromeda glaucophylla*). All bogs were bordered by black spruce (*Picea mariana*), jack pine (*Pinus banksiana*), white birch (*Betula alba*) or similar forests, occasionally open cut-over regions, but in all cases isolated or wilderness.

In some regions extensive sections have been lumbered so that there were openings over which the cranes fed and roamed. These ridges were often grown to blueberries while most bogs had cranberries. In drier ridges grasshoppers were common in summer and fall. All of these items were favorable for crane management. No matter how large the nesting bog, nearly all the crane nests were fairly close to the border. One exception was the great Sleeper Lake bog in northern Luce County where nests have been located far out from the ridges. But this bog has had both wet and dry meadowlike regions apparently with plenty of food.

Some nesting bogs have been less than 2 acres in size; others consisted of thousands of acres. Normally several pairs of cranes nested in the larger bogs while in the smaller ones there was but a single pair.

In nearly all Upper Peninsula crane bogs there are no nearby grain or hay meadows. The Fibre, Chippewa County, habitat has been the exception. Apparently there cranes nest near fields to which they take their young after hatching.

TABLE 2. 1976 Sandhill Crane departure from night roost, Fibre, Chippewa County.

Hour	Number of Cranes Leaving: 25 Sept. Cloudy Temp. 30-32°F. Light wind	26 Sept. Cloudy Temp. 30-32°F.	27 Sept. Cloudy Temp. 44°F. Little wind
0640	Sunrise	Sunrise	
0645	10		Sunrise
0646	19		
0648	118		
0650		12	
0654-0658	48	82	14
0700-0710	52	123	213
0711-0715	8	92	116
0716-0720	0	0	11
0726			15
0854		86	
1037-1055	57		
Total	312	395	369

The Nests

All but one of the 46 Sandhill Crane nests that I have observed in the Upper Peninsula of Michigan have been placed in sphagnum moss-leatherleaf bogs (Fig. 2). When I found they were using bogs rather than sedge meadow or marsh, most of my field work was confined to this biotope.

In the sedge marsh in 1937 the nest was constructed of sedges (*Carex* sp.). It measured 60 × 65 cm across and was raised 15 cm above the surrounding water which was 15 cm deep. The dead sedges around the nest were about 30 cm tall. A willow clump, 2.4 m tall grew 1.8 m from the nest. Most of the marsh was open but some of it was dotted with willow and other bushes, while the entire region was surrounded by black spruce forest. The area seemed untouched by man except for a small clearing where a cabin was located at one end of the marsh.

The bog nests were built of wads of sphagnum and twigs (apparently pulled off) from surrounding bushes of leatherleaf, bog laurel, Labrador tea and bog rosemary. In 2 nests placed on small islands, twigs and branches (sometimes 2.5 cm thick, 32-35 cm long) from neighboring pine and spruce trees were used. Each nest had a very slight concavity for the eggs. The average dimensions of 37 nests was 68.5 × 61.4 cm across and the average thickness of the pile of twigs was about 3 cm. Extremes in measurements were from 117 × 119 cm to 30 × 39 cm. Water depth at the

FIG. 2. Author at wooded bog nesting site, Beaubier Lake region, Kinross Twp.,

edge of the nest was from 0 to 42 cm with the mean 8.1 cm. Deeper water often surrounded the nesting region. Seven nests were placed on low islands grown to leatherleaf. In some bogs there was a moat border 5 to 6 m wide and 2 to 3 m deep.

Ten nests were built among bog plants, hidden by the leatherleaf growing around them. Nineteen nests were placed similarly but had a tree (usually 1 to 3 m in height) within 2 or 3 m of them. Three nests were adjacent to large bushes. One was in the bog but back 6 m from the edge amongst the black spruces (Fig. 3). Seven nests were on small islands with small (up to 10.6 m tall) trees and leatherleaf producing adequate isolation. Nests averaged 30.8 m from dry mainland, ranging between 7.6 and 425 m.

In contrast, of the 245 nests that I have observed in the Lower Peninsula only 1 was built in a leatherleaf bog. The others were built in wet meadows or in marshy lake borders. The mean size of 194 Lower Peninsula nests was 132.1 × 103.5 cm, the height above surrounding water was 13.62 cm and the mean water depth adjacent to the nest was 27.4 cm. These Lower Peninsula nests were built in dead emergent vegetation (before the new growth appeared) as follows: 100 in cattail (*Typha latifolia* and more rarely *T. angustifolia*); 67 in *Carex* sp.; 46 in bulrushes (*Scirpus validus*); 23 in loosestrife (*Decodon verticillatus*); while 7 were built in other vegetation such as *Sparganium eurycarpum*.

The Lower Peninsula nests were built in the following counties: Barry, 4; Calhoun, 42; Clinton, 11; Eaton, 8; Ingham, 1; Jackson, 156; Kalamazoo, 2; Livingston, 7; Mason, 2; Washtenaw, 12. In addition a nest without eggs was found in Branch County and parents were observed with chicks in Hillsdale and Oceana counties.

TABLE 3. Sandhill Crane departure for night roost 26 Sept. 1976, Fibre, Chippewa County.

Hour	Flock sizes going to roost	Total
1807	5	5
1809	2, 3, 7, 10, 4	26
1810*	17, 2	19
1812	2, 3, 8, 4, 10	27
1815	10, 2	12
1817	2	2
1821	5, 2, 50, 19	76
1825	24, 47, 4, 14	89
1827	24, 20	44
1828	26, 4, 4	34
Total		334

Most flights in long straight or wavy lines, some in V-formation. Wind north, flight 400-600 ft.
*Sunset.

The Eggs

Michigan Sandhill Crane eggs are darker in color and more heavily spotted than those of the Florida Sandhill Crane (*G. c. pratensis*), Mississippi Sandhill Crane (*G. c. pulla*) and Cuban Sandhill Crane (*G. c. nesiotes*). Sixty-five Upper Peninsula eggs averaged (in measurements) 91.84 (76-104) × 59.24 (51.8-65.2) mm. In 1 definite region at Betchler Lake a nest was used 3 consecutive years and nests were found 2 other years

TABLE 4. Sandhill Crane observations in Michigan's Upper Peninsula: Chippewa County. E, eggs; Y, young.

Year	Days in field		Total hours	Estl. miles walked	Cranes observed	Nests found & contents	Cranes per hour
1934	29 May	(1)	15	5	0		0.00
1940	30 May-1 June	(3)	47	8	7		0.148
	31 Aug.-1 Sept.	(2)	26	4	9		0.345
1941	5 May, 31 May	(2)	9	4	17		1.889
1943	6-19 May	(8)	82	24	78	1E, 1E, 2E	0.951
1949	30-31 July 3 Sept.	(3)	14	2	20		1.428
1950	2 Sept.	(1)	2	2	49		24.500
1951	31 Aug.	(1)	6	3	0		0.00
1952	22, 29 May 21 June	(3)	25	7	28	2Y, 2E	1.120
1953	17 June	(1)	5	3	10		2.00
1954	20, 23 June	(2)	7½	4	4		0.667
1956	18 June 1 Sept.	(2)	7	5	48		6.857
1958	2, 4 May	(2)	4	5	14	2E	3.500
1961	27 May	(1)	7	3	7	1Y	1.000
1966	26 May	(1)	3	3	7		2.333
1967	18-20 May	(3)	31	9	18	2E, 2E, 1E	0.580
1970	27 May	(1)	15	6	15	1E, 2E, 2Y	1.000
1971	21 May	(1)	14	5	2	2E, 2E	0.143
1973	17, 18 May	(2)	13	6	34	2E, 2E	2.615
	23 May	(1)	10	12*	16	2E, 2E, 2Y	1.600
1974	24, 25 May	(2)	8	4	4	2E, 2E	0.500
1975	16, 23, 24 May	(3)	11	8	11	2E, 2E	1.000
1976	14, 15, 17, 19 May	(4)	24	8	56	2E, 2E	2.333
1977	19 May	(1)	6	3	28		4.667
Totals	50 days		391½	140	482	26	1.231

*E. Tolhurst.

very near to that point. The eggs in those nests measured the smallest of any I have found and follow: 1970, 1 egg: 76.0 × 55.6 mm; 1973: 82.0 × 54.6 and 80.8 × 54.8 mm; 1974: 78.4 × 53.9 and 82.6 × 53.5 mm; 1975: 78.3 × 51.8 and 89.0 × 53.8 mm; 1976: 74.5 × 53.0 and 84.6 × 55.7 mm.

The mean and extreme sizes of 348 Lower Peninsula Sandhill Crane eggs were 94.17 (85.5-108.0) × 60.54 (54.5-65.6) mm and the average weight of 231 Lower Peninsula eggs was 178.36 (120.0-219.2) grams. Two eggs in the Upper Peninsula weighed 175.0 and 216.3 grams when freshly laid.

In the Upper Peninsula 2 completed clutches of 1 egg were found and 41 clutches of 2 eggs. In comparison, in the Lower Peninsula 14 clutches of 1 egg were found, 222 of 2 eggs and 1 of 3 eggs.

Dates and contents of Sandhill Crane nests (marked "N" on Fig. 4) found at Betchler Lake, Kinross Twp., Chippewa County, have been as follows:

1. 7 May 1943 – 1 egg (incomplete)
2. 9 May 1943 – 1 egg (incomplete)
3. 11 May 1943 – 2 eggs

TABLE 5. Sandhill Crane observations in Michigan's Upper Peninsula: Schoolcraft County.

Year	Days in field		Total hours	Estt. miles walked	Cranes observed	Nests found & contents	Cranes per hour
1934	29 May-5 June	(4)	56	25	4		0.071
1935	7-20 June	(6)	91	55	4		0.044
1937	5-13 May	(9)	106	69	38	2E	0.358
1942	5 Sept.	(1)	6	1	9		1.500
1949	4 Sept.	(1)	6	4	13		2.166
1950	3 Sept.	(1)	7	7	34		4.857
	8 Oct.	(1)	3	1	0		0.000
1951	1, 2 Sept.	(2)	12	4	2		0.167
1952	25-28 May	(4)	50	16	33	2E	0.660
	22-25 June	(3)	41	3	5	1Y	0.121
	30, 31 Aug.	(2)	18	3	13		0.722
1953	18 June	(1)	5	4	0		0.000
1954	24, 28, 29 June	(3)	20	9	3		0.150
1955	16-22 June	(4)	51	13	8		0.157
1956	1 Sept.	(1)	3½	1	20		5.714
1957	13, 18, 23 June	(3)	17	6	6		0.352
1958	3, 4 May, 8, 30 June	(4)	28	11	30		1.071
1960	28, 29 May	(2)	18	5	2		0.111
1973	20 May	(1)	2	2	1	2E	0.500
1975	17 May	(1)	3	2	0		0.000
Total		54	543	241	225	4	0.414

4. 22 May 1952 – 2 chicks
5. 22 May 1952 – 2 eggs
6. 2 May 1958 – 2 eggs
7. 27 May 1961 – 1 chick (probably 2 chicks)
8. 19 May 1967 – 2 eggs
9. 20 May 1967 – 1 egg hatching (Crego Lake)
10. 20 May 1967 – 2 eggs
11. 27 May 1970 – 1 egg (incomplete)
12. 27 May 1970 – 1 egg, 1 chick
13. 28 May 1970 – 2 chicks
14. 18 May 1973 – 2 eggs
15. 18 May 1973 – 2 eggs
16. 23 May 1973 – 2 eggs
17. 23 May 1973 – 2 (?) chicks
18. 23 May 1973 – 2 eggs
19. 25 May 1974 – 2 eggs
20. 25 May 1974 – 2 eggs
21. 16 May 1975 – 2 eggs
22. 24 May 1975 – 2 eggs
23. 15 May 1976 – 2 eggs.

Laying and Hatching of Eggs

No Sandhill Crane nests were found for sure in the Upper Peninsula during the laying period. On 7 and 9 May 1943, 2 nests were found,

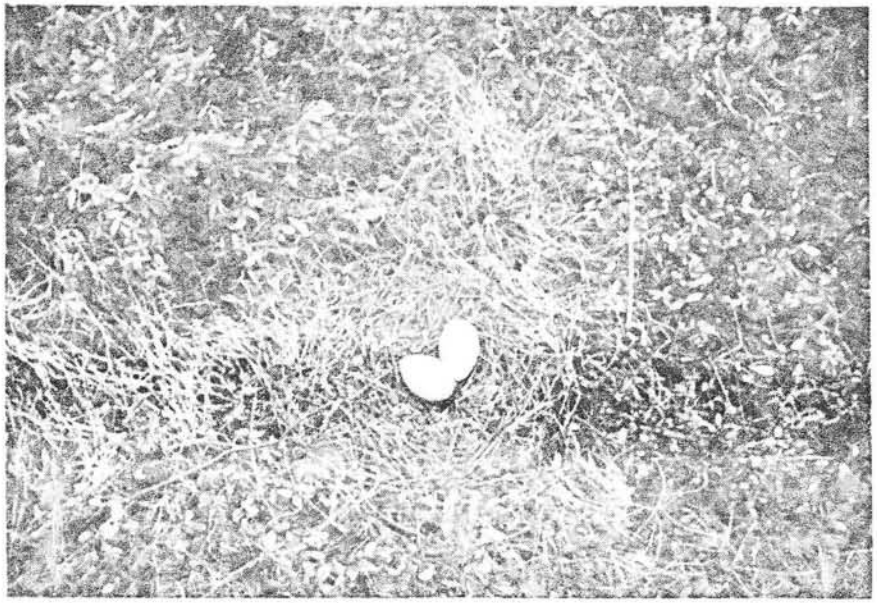

FIG. 3. Sandhill Crane nest in black spruce bog, Kinross Twp., Chippewa Co., 19 May

each with 1 egg, but in both cases the egg disappeared and no second egg was observed. Since the incubation period is between 28 and 32 days with the average about 30 days, laying time can be estimated from hatching dates. I have found 10 nests with eggs hatching. These dates follow: 21-22 May 1952, 24 May 1952, 27 May 1961, 21 May 1967, 25-26 May 1970; 27-28 May 1970 (Fig. 5), 22 May 1973, 22-23 May 1973, 16-17 May 1976 and 19-30 May 1976. Thus the mean hatching date was 22-23 May. Allowing 30 days for incubation, egg laying would average about 20-22 April. The earliest nest I observed in the Upper Peninsula was 2 May 1958 (2 eggs). The earliest hatching date was 16-17 May 1976 when a nest had 2 chicks at Hiawatha Sportsman's Club, Mackinac County.

By comparison, the average laying time in the Lower Peninsula was 9-10 April with extremes 22 March and 26 April while hatching averaged 8-10 May with the earliest 23 April (1977) and the latest 28 May (1935).

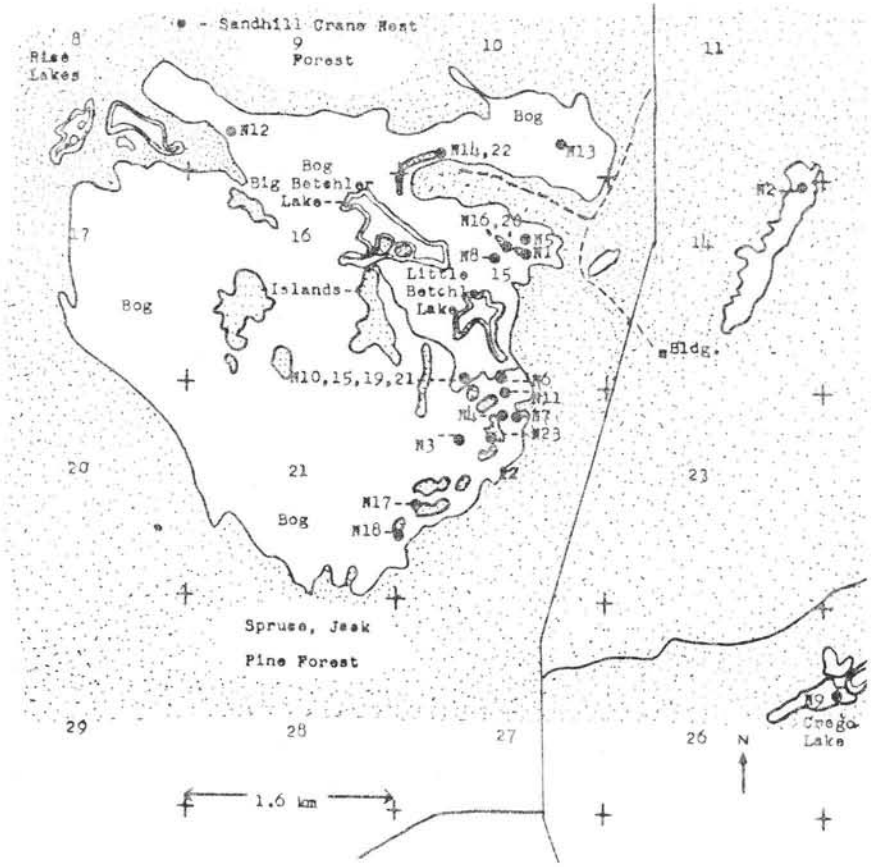

FIG. 4. Nesting of the Sandhill Crane in the Hiawatha National Forest, [illegible]

In 2 cases Sandhill Cranes in Michigan apparently nested twice in 1 year. In each case the first nest was destroyed and the birds produced a second clutch on the same territory but not in the same nest. In the Lower Peninsula, at Baker Sanctuary 2 eggs were laid of which one hatched 10 June 1948. In Schoolcraft County, Upper Peninsula, in a small pond-bog, a chick hatched from a second nest 23 June 1952.

The Young

Newly hatched chicks in the Upper Peninsula are slightly smaller than those in the Lower Peninsula. In other respects they are similar. Measurements of chicks from both peninsulas are given in Table 1. During the summer adults and chicks roam the nest bogs and their edges and clearings in search of food. After the young birds are capable of flight (exact age uncertain) the family groups remain for some time in the bog region but in late August and early September families often join together in large flocks. In the Sleeper Lake region, Luce County, these flocks are found out in the bog in shallow water, roosting in close proximity. At break of day they disperse in many directions in search for food. I have seen examples of concentrations as follows:

1950:	2 Sept.	49 observed at Crego Lake, Chippewa Co., Sec. 25, T45N, R5W.
	3 Sept.	24 observed, Seney Natl. Wildlife Refuge, Schoolcraft Co., T45N, R14W.
	4 Sept.	54 observed at Sleeper Lake, Luce Co., Sec. 33, T48N, R10W.
1951:	1 Sept.	66 observed at Sleeper Lake, Luce Co., Sec. 33, T48N, R10W.
1952:	30 Aug.	70 observed at Sleeper Lake, Luce Co., Sec. 33, T48N, R10W.
	30 Aug.	7 observed at Wise Lake, Alger Co., Sec. 28, T48N, R15W.
1956:	1 Sept.	45 observed at Betchler Lake, Chippewa Co., Sec. 15, T45N, R5W.
	1 Sept.	20 observed at Stanley Lake, Schoolcraft Co., Sec. 11, T47N, R16W.
	2 Sept.	64 observed at Sleeper Lake, Luce Co., Sec. 33, T48N, R10W.
1976:	24 Sept.	312 observed at Fibre, Chippewa Co., Sec. 16, T44N, R3W.
	25 Sept.	199 observed at Fibre, Chippewa Co., Sec. 16, T44N, R3W.
	26 Sept.	395 observed at Fibre, Chippewa Co., Sec. 16, T44N, R3W.
	27 Sept.	369 observed at Fibre, Chippewa Co., Sec. 16, T44N, R3W.

Nesting Success

For many nests in the Upper Peninsula I never ascertained the outcome, but of 18 nests whose outcome was known, 12 (66.7%) were successful in fledging at least one chick. Of 33 eggs, outcome known, 23 hatched and 23 chicks left the nest (69.7%). In the Lower Peninsula, I have known the outcome of 192 nests in which 153 had eggs hatch and 151 where chicks fledged (78.6%). In these nests 366 eggs were laid of which 272 hatched and 262 chicks left the nest (71.6%).

In the Upper Peninsula during late summer and early autumn, I have seen groups of 2, 3, and 4 cranes on 111 occasions. 72 of those were

these 111 pairs produced 50 young capable of flight or .45 young per pair per year.

Departure and Arrival of Cranes at Night Roosts

On many occasions in the early morning I have watched cranes leave their watery night roost in late summer and early autumn. It has always been necessary to begin watching before daylight because in most roosts some cranes begin departing with the first flicker of daylight. Normally at 0830 hrs. EST nearly all cranes have flown to the feeding regions. Some cranes stop in a place where they do not feed and later proceed to the feeding region. Many, however, go directly from the roost pond to the feeding area, especially if it is a grain field, such as occurs at the Kermit Cartwright farm near Fibre.

At Seney, Stanley Lake, Wise Lake, Sleeper Lake and Cranberry Lake, cranes fly out onto open plains or dry open bogs. Formerly this also happened at Betchler Lake but when farmers began raising spring grains near Fibre, cranes began concentrating there in the autumn. In so doing they began to damage wheat crops. Finally a program sponsored by the East Michigan Nature Association financed the growing of wheat for the cranes on the farm of Kermit Cartwright. Now the cranes concentrate on these fields and do not damage nearby wheat. They can obtain both oats and wheat on the Cartwright farm and the Cartwrights are very much interested in their protection. In Tables 2 and 3 arrival and departure from the Cartwright field are given for the mornings of 25, 26 and 27 September 1976 and for the evening of 26 September 1977. These cranes roosted in the region of Sec. 1, T44N, R4W and fed in Sec. 9, T44N, R3W. They flew approximately 3 miles (4.8 km) between their night roost and the feeding grounds. They departed in the morning from the roost about the time of sunrise and returned at night at approximately the time of sunset.

TABLE 6. Sandhill Crane observations in Michigan's Upper Peninsula: Luce County.

Year	Days in field		Total hours	Esti. miles walked	Cranes observed	Nests found & contents	Cranes per hour
1943	21, 22 May	(2)	23	7	25	2E	1.088
1945	2 Sept.	(1)	8	4	44		5.500
1949	3, 4 Sept.	(2)	8	2	9		1.125
1950	2, 3 Sept.	(2)	7	11	62		8.857
	7, 8 Oct.	(2)	6	6	3		0.500
1951	1 Sept.	(1)	3	2	66		22.000
1952	23 May	(1)	13	5	24	2E	1.846
	30 Aug.	(1)	4	2	70		17.500
1953	17 June	(1)	4	3	25		6.250
1955	18 June	(1)	7	3	4		0.571
1956	19, 22 June	(3)	19	6	6		0.315
	2 July						
	2 Sept.	(1)	3	2	45		15.000
1957	24 June	(1)	12	2	2		0.167
1958	4 May	(1)	4	4	1		0.250
1967	20-22 May	(3)	39	11	80		2.050
1968	16-18 May	(3)	32½	13	51	2E	1.569
1973	18 May	(1)	1	2	10	2E, 2F	10.000
1975	17 May	(1)	5	2	2	2E	0.400
1976	17 May	(1)	4	5	3	2E	0.750
Total		29	202½	92	532	7	2.622

Arrival and Departure Dates in Chippewa County

The Kermit Cartwrights noted first cranes at their farm on 12 April 1972 (still snow on ground), 18 March 1973, 9 April 1974, 15 April 1975 (12 inches snow on ground), 31 March 1976 (still snow on ground).

Mr. and Mrs. Hutton who live within two miles of Whitefish Point, Chippewa County, first noted cranes on 16 April 1959 (4), 14 April 1960, 15 April 1961, 5 April 1962, 11 April 1963, 17 April 1964, 19 April 1965, 9 April 1966, 1 April 1967, 10 April 1968, 11 April 1969, 16 April 1970, 11 April 1971, 16 April 1972, 13 April 1973, 13 April 1974, 27 April 1975 (2) and 15 April 1976 (6). The mean date of arrival at Cartwrights' was 4 April and at Huttons', 13 April.

FIG. 5. Sandhill Crane egg and nestling, Betchler Lake, Chippewa Co., 27 May 1970.

TABLE 7. Sandhill Crane observations in Michigan's Upper Peninsula: Other Counties.

Year	Days in field		Total hours	Esti. miles walked	Cranes observed	Nests found & contents	Cranes per hour
			Mackinac County				
1943	6-19 May	(8)	53	24	23		0.434
1951	2 Sept.	(1)	2	2	4		2.000
1952	24 May	(1)	12	5	6	2E	0.500
	31 Aug.	(1)	3	2	5		1.667
1958	2 May	(1)	4½	3	1		0.022
1973	24, 25 May	(2)	7	4	0		0.000
1974	25 May	(1)	5	3	2	2E	0.400
1975	19 May	(1)	7	4	2	2E	0.285
1976	17, 18 May	(2)	19	4	26	2E, 2Y	1.365
Total		18	112½	51	69	5 nests	0.524
			Alger County				
1952	30 Aug.	(1)	4	1	7		1.750
1960	26 June	(1)	15	2	2		0.133
1967	22, 23 May	(2)	6	5	2		0.333
1971	18 May	(1)	12	4	4	2E, 2E	0.333
1973	20, 21 May	(2)	13	6	32	2E	2.461
1975	22, 23 May	(2)	9	6	0		0.00
1976	22, 23 May	(2)	4	0	0		0.00
Total		11	63	24	47	3 nests	0.746
			Other Regions — Marquette County				
1975	21, 22 May	(2)	9	5	4		0.444
1976	18, 19 May	(2)	1	0	1		1.000
			Baraga County				
1976	19, 21, 22 May	(3)	16	7	3	2Y	0.187
1977	20, 21 May	(2)	12	6	5		0.416

Fall departure dates at Huttons, near Whitefish Point were 18 September 1963, 30 September 1966, 6 October 1967, 10 September 1969. Departure dates at Fibre at Cartwrights were 28 September 1973 (large group), 13 October 1974 (4 in field), 5 October 1975 and 15 October 1976.

At Sleeper Lake, Luce County, I observed 62 cranes on 3 September 1950 but only 3 there on 8 October.

Summary

Cranes in northern Michigan have increased during the past 45 years. They have been found nesting in Alger, Baraga, Chippewa, Delta, Luce, Mackinac and Schoolcraft counties by the [illegible]

They nest in bogs or, rarely, sedge marshes in the Upper Peninsula in contrast to open marshes in the Lower Peninsula. Most often Upper Peninsula nests are placed in sphagnum moss-leatherleaf bogs where water is shallow. Nests are built of wads of moss and twigs from nearby leatherleaf and other bushes. They are smaller than southern Michigan nests.

Upper Peninsula Sandhill Crane eggs are slightly smaller than Lower Peninsula eggs. Clutches in the Upper Peninsula included 41 of 2 and two of 1 egg. The mean date of discovery of nests was 19 May (2-28). One second nest was found 23 June, after the first was destroyed. Laying was estimated to occur about 20-22 April and hatching occurred between 16-17 May (1976) and 27-28 May (1970) with the mean, 22-23 May (10 records). Upper Peninsula downy chicks are slightly smaller than those in the Lower Peninsula.

In autumn Upper Peninsula Sandhill Cranes join into flocks which roost at night in shallow water in some pond, lake or bog. Most feed where they cause no damage to crops but in the Fibre, Chippewa County, they have caused damage to spring wheat. This has been temporarily remedied by planting wheat and oats on one farm in the neighborhood which are not harvested but left for the birds to eat.

Cranes in fall leave their night roost about sunrise and return about the time of sunset. Upper Peninsula cranes arrive in spring in late March or April and depart in the fall in late September or early October.

The similarity of northern Michigan Sandhill Crane habitat to that of the Whooping Crane makes this population a logical choice for cross-fostering attempts.

— *1145 Scenic Drive, Muskegon, Michigan 49445*