POPULATION EVALUATION OF PIPING PLOVERS AT LAKE OF THE WOODS, MINNESOTA

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INTRODUCTION

Piping Plovers at Lake of the Woods (LOTW), MN represent a unique population occupying a critical geographic location in the species' distribution. The northwestern Minnesota site provides an important link between birds on the Great Lakes, populations on Manitoba lakes, and those in adjacent prairie sites (Haig, unpub. data). The recent disappearance of breeding Piping Plovers in Wisconsin, and continued reproductive failure of birds at the Duluth Port Terminal further illustrates the critical position of the LOTW population. Finally, LOTW birds represent the only viable population of Piping Plovers in Minnesota (Haig 1986).

Since 1982, Piping Plovers have been studied at 5-6 sites at LOTW (Wiens 1986, Oring and Haig 1985). Initial work concentrated on collection of individual life history data, while research carried out during the past 2 years has focused on monitoring the population as a whole. Information presented in this report utilize data from 1982-1985 to gain perspective on results from 1986.

METHODS

Field trips were carried out from 14-17 May, 5-8 June, 3-6 July, and 15-18 July by S. Haig, L. Oring, and assistants. During each visit, Piping Plovers were censused at Zippel Bay, Morris Point, Pine Island, Curry Island, and Oak Point. Adults and chicks were caught in mist nets and individually marked with international flags, USFWS aluminum bands, and 3 color

bands. Factors influencing mortality and reproductive success were also monitored.

RESULTS

Banding summary: Three adults were rebanded (same colors) this season. Three transients and two breeding birds were not banded. The remaining birds had been banded in previous years. Hatching chicks were given temporary band combinations, and all 9 fledged chicks were given complete combinations. None of the birds previously banded with flags had lost them. None exhibited detrimental effects from flag use.

Breeding site fidelity/natal philopatry: In 1986, 84-87% of the Piping Plovers at LOTW had hatched or previously bred on the study sites. These data are consistent with return patterns from previous years (Table 1) and other populations (Haig and Oring 1985). High return rates indicate a low recruitment of individuals from outside the area into the population. It is noteworthy, however, that five of six adults banded as new breeders in 1985 were present again in 1986. Twenty percent of last year's chicks (n=10) returned to breed.

Population estimate: The 1986 population at LOTW consisted of 11 breeding pairs, 9-10 transients, and 14 chicks (Table 2). In addition, at least 1 bird was seen at Rocky Point (Huschagen, pers. comm.). This estimate of 31-32 birds represents an 11-24% decrease from 1985 (Oring and Haig 1985). Pair counts from previous breeding seasons (Table 3) indicate the number of pairs present in 1986 is approximately 50% less than pair counts for

Table 1. Breeding site fidelity and natal philopatry at LOTW, 1983-1986.*

New Birds Banded		N Obs. 1983	N Obs. 1984	N Obs. 1985	N Obs. 1986
Adults in 1982:	37	26	16	13	3
Chicks in 1982:	26	9	5	2	2
Adults in 1983:	8	-	7	4	3
Chicks in 1983:	44	-	6	11	1
Adults in 1984:	2	-	-	0	0
Chicks in 1984:	14	-	-	4	5
Adults in 1985:	6	-	-	-	5
Chicks in 1985:	10	-	-	-	2+
Total returned		35	34	34	21(+5)=26
Total resident population		42	44	36-42	31-32
% Return		83.3	77.3	81-94.4	84-87

*pre-1985 data from Wiens 1986.

Table 2. Population censuses at LOTW in 1986

Date	Morris Pt.	Pine Is.	Mid-isl.	Oak Pt.	Zippel	TOTAL
15 May	3	10	0	3	0	16 ± 3
8 June	4	13	-	4	0	21 ± 5
5 July	3(2)	14(8+)	2	2(4)	0	21(14)
17 July	2	3(9)	0	0	0	5(9)
Breeding Pairs	2	7	0	2	0	11

() Chicks present
- No census conducted

Table 3. Breeding population at LOTW, 1982-86.*

YEAR	Number of Breeding Pairs PINE/CURRY	MORRIS POINT	ZIPPEL BAY	TOTAL
1982	12	2	0	14
1983	16	3	1	20
1984	18	4	0	22
1985	16-19	2	-	18-21
1986	9	2	0	11

* Pre-1985 data from Wiens 1986.

1983-85. The largest decrease was found on Pine Island, while nesting density remained the same at other sites.

Reproductive success: Nine chicks fledged from Pine Island representing an average fledging rate of .8 chicks per pair. The fledging rate per pair is similar to 1985 data (Table 4), however, the number of chicks produced is considerably less.

Mortality: The factors responsible for poor nest and/or brood success are varied. Early summer storms washed out nests at Morris Point and Oak Point. It was not clear if storms affected success at Pine Island, but the presence of a mink was responsible for the destruction of eggs and chicks. It is possible the mink was also responsible for the death of two adults on Pine Island and one on Rocky Point (Huschagen, pers. comm.). The dead birds were banded as adults in 1982.

Additional causes for population decline: The numbers and success of Piping Plovers at LOTW has declined dramatically over the past 3 years. Increased water levels on the lake have decreased the amount of habitat available to Piping Plovers and other species. Decreased nesting habitat for Ring-billed Gulls on other islands increases their density, and subsequent chance of destroying Piping Plover eggs, on Pine Island, Morris Point, and Oak Point. Predation of adults (discussed above) not only affects current population levels, but may significantly affect future populations if recruitment continues to be low.

Table 4. Reproductive success of Piping Plovers at LOTW, 1982-86.*

YEAR	NUMBER CHICKS FLEDGE	NUMBER CHICKS FLEDGE PER PAIR
1982	26	1.7
1983	44	2.1
1984	13	0.6
1985	7-10	.4-.5
1986	9	0.8

*Pre-1985 data from Wiens 1986.

DISCUSSION

Management of LOTW Piping Plovers: Immediate and continued removal of mammalian predators is the most essential element of a successful management plan for Piping Plovers at LOTW. A single mink can destroy all chicks and a significant number of adults in a short period of time. Secondly, restriction of human activity on the islands should continue. The SNA signs seem to be successful and should be maintained. In addition, promotional material (perhaps the poster developed by the Atlantic Piping Plover Recovery Team) could be distributed to resort owners to instill the importance of preserving the islands. Occasional presentation (in Baudette) of the DNR's slide show on the birds may also facilitate public support of the project. Finally, lowering of water levels will create additional nesting habitat and secure sites already used. Perhaps a cooperative effort between the Minnesota DNR and Ontario Ministry of Natural Resources could speed mitigation of the issue.

Future study of Piping Plovers at LOTW: Success of the birds depends on elimination of unnecessary disturbance to nest sites. Future research need only consist of monitoring population densities and reproductive success via short-term censuses once or twice per year. Nest searching, handling eggs, or unnecessary capture of chicks causes needless disturbance and increases the chance of predation in nesting areas.

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