

SASKATCHEWAN RESULTS OF THE 1991 INTERNATIONAL PIPING PLOVER CENSUS

MARGARET A. SKEEL, Saskatchewan Natural History Society, Box 4348, Regina, Saskatchewan. S4S 3W6; DALE HJERTAAS, Wildlife Branch, Saskatchewan Natural Resources, 3211 Albert Street, Regina, Saskatchewan. S4S 5W6

In the spring of 1991, attention from researchers and naturalists across Canada and the United States was focused on the Piping Plover. All 9 provinces and 28 states where Piping Plovers are known to breed participated in a coordinated effort of a complete census of Piping Plover breeding habitat. This census was the most extensive ever undertaken for a nongame species. The goal was to attain a reliable estimate of the current Piping Plover population. In Saskatchewan, the survey was coordinated by the authors.

The Piping Plover, a small shorebird that nests on sandy or gravelly beaches of temperate North America, occurs on the Prairies and Great Plains, in a declining area of the Great Lakes region, and along the Atlantic coast. It was likely never abundant because of its very specific needs and choice of transitional habitat.³ That its numbers had declined was first suggested by Bell and Cairns and McLaren.^{2,4} Recent surveys indicate that the decline may have continued because of habitat deterioration caused by drought conditions in the 1980s on the Prairies, and increasing human disturbance. In 1985, the Piping Plover was designated "Endangered" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).⁷

Historical information on Piping Plovers in Saskatchewan is limited.^{5,19,20,21} Piping Plover censuses have been conducted in Saskatchewan since 1984.^{11,12,14,16,17,19,26} The provincial population estimate of 2,000-2,500 in 1984 was down to 700-800 in 1986, and to 500 in 1988.⁶ Because past surveys addressed only part of the species range in any one season, it was not known whether the apparent population changes were due to movement or real population change.

Selection and Surveying of Sites

All wetlands south of the boreal forest in Saskatchewan, as well as along the southern edge of the boreal forest, and the south shoreline of Lake Athabasca were considered for the survey.

Data on basins with previous Piping Plover use and on areas previously searched for plovers, as well as suggestions from volunteers, were evaluated to select census sites.^{22,23} Topographical maps (1:250,000) were studied to locate wetlands with no previous information. Many of these were subjectively selected, including those believed to have potential breeding habitat.

Ninety wetlands of recent (1984 or later) use or good potential for Piping



Pair of Piping Plovers.

Keith Barr

Plovers were surveyed by biologists from Saskatchewan Wildlife Branch (SWB) and Canadian Wildlife Service (CWS), or were tendered out to consulting biologists on a contract basis. Five of these wetlands were surveyed as part of a separate Piping Plover project, but within the guidelines of this census.¹³

The hilly Missouri Coteau contains hundreds of basins of varying size, many with gravelly beaches. Because it was impractical to visit each, an aerial survey was conducted in this area on 8-10 May 1991 to identify suitable sites. Almost 200 of these were surveyed by biologists from SWB, CWS, and United States Fish and Wildlife Service (USFWS).

Over 80 volunteers participated in surveying 208 additional sites. These

included basins with less recent records of Piping Plovers (previous to 1984), basins surveyed since 1984 that had no plovers but were identified as having possible habitat, and the selected basins for which there was no previous information.

All surveys were conducted between 26 May and 21 June 1991. Surveys followed the schedule and procedure set out in the Guidelines for the 1991 International Piping Plover Breeding Census.^{8,24} In addition, data on habitat and potential threats to the habitat were collected.

For each site, surveyors mapped all observations of breeding pairs, single adults with nests, and unpaired adults. Only actual observed individuals were reported. Pairs were recorded only where two territorial

adults, presumed mated, were seen. A single adult with a nest or young was also considered a pair. Further details of methodology are available.^{24,25}

Results A total of 1,172 adult birds was counted in Saskatchewan. Of the 486 wetlands surveyed, Piping Plovers were found at 71 sites (Table 1). At 57 sites, one or more pairs were found; this indicates potential breeding locations.

Sites with Piping Plovers were not distributed uniformly (Figures 1 and 2). Clusters of plovers were found in the Missouri Coteau, along the eastern portion of Lake Diefenbaker, and in the Big Quill-Houghton Lakes and Manito Lake (also called Manitou Lake) areas. Four sites accounted for 651 Piping Plovers, or 56% of the Saskatchewan population. These sites were Lake Diefenbaker, Big Quill Lake, Chaplin Lake and Manito Lake.

The highest count of Piping Plovers was at Lake Diefenbaker, with 276 plovers. The large population of plovers was concentrated towards and in the Thomson and Gordon McKenzie arms (to Gardiner and Qu'Appelle Valley dams, respectively) of this huge reservoir. A total of 223 plovers was found in the arms, and 53 plovers in the eastern two-thirds of the body of the lake.

At Big Quill Lake, with 151 plovers, distribution was around the entire lake. At Chaplin Lake, all 113 plovers were found in the northern half of the lake and concentrated in the western (main salt mine) basin. At Manito Lake, with 111 plovers, distribution was greatest in the southeast bay and along the southwest and northern shores.

The Missouri Coteau also harboured an abundance of plovers. The 345 Piping Plovers counted here in 1991 were scattered over 39 of the 112 sites identified as having potential habitat. Including the 113 plovers at Chaplin Lake, the total count of 458 plovers for the Missouri Coteau comprised 39% of the Saskatchewan population.

Following drought conditions from 1984-1990, the spring of 1991 was exceptionally wet.²⁴ At most sites, weather did not notably affect the census results. However, populations may have been underestimated at Lake Diefenbaker, Big Quill Lake and Chaplin Lake.¹³

A total of 223 sites yielded no Piping Plovers, but either had habitat, or the potential for habitat in some later year.²⁴ A large number of sites (192) was judged to have no potential.²⁴

Discussion The total North American count was 5,482 Piping Plovers, including 2,441 breeding pairs.⁸ This is a very close estimate of the number of Piping Plovers remaining on earth. That this number is small is realized when compared to the estimates of hundreds of thousands of individuals of many other shorebird species.

Saskatchewan's count of 1,172 plovers was the highest of the provinces or states, followed by North Dakota with 992 plovers and Nebraska with 398. Piping Plovers were concentrated on the Northern Great Plains/Prairie, where 3,467 plovers were counted compared to 1,975 on the Atlantic coast and 40 on the Great Lakes.⁸ Saskatchewan's count comprised 60.1% of the Canadian population of 1,950 plovers, and 21.4% of the total North American count.

The largest breeding population of any basin in North America was found at Lake Diefenbaker, with 5.0% of the total population (8.0% of the Prairie population). Big Quill Lake ranked 6th in North America, with 2.8% of the population (4.4% of the Prairie population), Chaplin Lake ranked 8th with 2.1% of the population (3.3% of the Prairie population), and Manito Lake ranked 9th with 2.0% of the population (3.0% of the Prairie population).

Parts of Lake Diefenbaker have been surveyed since 1984.^{9,11,12,15} Counts in the arms of the lake, where five years of complete surveys have been conducted, have varied from a low of zero plovers in 1986, to a high of 223 in 1991.^{9,13} These dramatic fluctuations in number appear to be directly related to water level. In 1986, water levels were very high at the time of the survey and beach width was significantly reduced, in contrast to low levels in 1991.

Rapid increases in water level as the Lake Diefenbaker reservoir fills represent a significant threat to the species in Saskatchewan. In 1991, water level increased 6.55 m during the breeding season (1 May to 18 July). When water levels are low, as usually occurs at the time of nest initiation, habitat appears to be excellent and attracts large numbers of plovers. When water levels rise above beaches, nesting or family groups of plovers are flooded and habitat availability is reduced to near zero. Rapid rises can occur within a period of one or two weeks. When this occurs in mid-June or July, plovers rarely reneest elsewhere, resulting in very low productivity.

Big Quill Lake has consistently yielded plovers, and regularly high counts, since annual surveys began

in 1984. Counts varied from a low of 43 plovers in 1989, when less than 25% of the basin contained water, to a peak of 300+ in 1985.^{10,11} Although the water level has continued to decline since 1989, the population has been increasing, and reached 151 in 1991.¹³

Changing habitat quality likely influenced population fluctuations at Big Quill Lake. By 1989, water levels had receded such that distances from traditional nesting beaches to water increased to 1-10 km.¹¹ In 1990, plovers began nesting on gravel beaches closer to the existing water level; use was likely due to vegetative growth along these previously barren beaches.¹² Use of the new beaches increased in 1991.¹³ The Piping Plover population may continue to increase if habitat suitability of new beaches increases. However, a rise in water level may flood the new beaches and cause a marked reduction in available nesting habitat.

Chaplin Lake, a large, shallow lake comprised of four connected basins, has consistently supported Piping Plovers. The peak count of 253 plovers in a 1984 survey of 48% of the shoreline contrasts with the counts of only 57 plovers and 66 plovers in complete surveys in 1987 and 1990, respectively, when water levels were very low.^{12,14,15} In years of low water, birds were concentrated on basins with the most water. An increase in the plover population in 1991 to 113 birds corresponded to an increase in water levels due to heavy precipitation.¹³

With productivity at Chaplin Lake higher than at other sites where the Piping Plover has been monitored, this site is important to its recovery.²⁵ Except for unpredictable drought

conditions, few factors threaten the population here.

The high count of 111 Piping Plovers at Manito Lake was unexpected, although plovers have been previously found here.¹⁵ The entire shoreline was surveyed for the first time in 1991 and yielded 81 plovers along the lake shore and 30 on the large island. Piping Plover usage was restricted to areas of abundant good nesting habitat. Most of this habitat was occupied by plovers, whereas much of the habitat judged as poor quality was unused. In some areas of use by cattle, suitability of habitat was reduced due to heavy trampling.

Many basins in the Missouri Coteau have been previously surveyed.²⁴ Most of these had noticeably higher counts in 1991 than on earlier surveys, including: Sandoff, East Coteau, West Coteau, Big Muddy, Fife, Willowbunch, Edna, Elsie and McDonough Lakes. Likely the heavy precipitation in the spring of 1991 replenished water in basins that had become very low or dry. With 42 plovers in 1991, Old Wives Lake, where water levels remained low, had a similar count of 39 plovers in a 1984 survey of 72% of the shoreline.¹⁵

Montague Lake is an exception to the observed pattern: 12 plovers were counted in a 1984 survey of 53% of the shoreline versus only 4 plovers in 1991.¹⁵ Severely reduced beach width in 1991 due to higher water (W. C. Harris, pers. comm.) likely accounted for the low population.

Missouri Coteau basins, like others in southern parts of the province, tend to be shallow and are often small. Habitat conditions are in flux,

reflecting an interplay of water level and vegetative encroachment. As a result, the population level appears to be unstable and to fluctuate from year to year.

Cattle were identified as posing a threat to the plover population at 10 sites, and to a much lesser extent at 10 other sites.²⁴ Further investigation may disclose cooperative ways of reducing this threat.

Several other areas consistently support small populations of Piping Plovers. At Redberry Lake, where the count was 21 in 1991, surveys since 1984 indicate a declining population, with a peak count of 41 plovers in 1985.^{13,18} Northeast of Saskatoon, in the Muskiki-to-Lenore Lakes areas, 43 plovers were counted at 7 basins, 6 of which have previous records.

The Great Sandhills area of southwest Saskatchewan supports a small population. Seven Piping Plovers were counted in 1991 at two basins, Freefight and Ingebright Lakes, and Piping Plovers were noted at a third, Antelope Lake, in 1986 (14 plovers), 1988 and 1989 (W. C. Harris, pers. comm.).²⁶ Scattered historical records indicate that the wetlands in western Saskatchewan, between the South Saskatchewan River and North Battleford, supported plovers during the 1970s.²² These basins tended to be low or dry and overgrown with vegetation in 1991, and very few of them had plovers.

A survey of about 75% of the south shore of Lake Athabasca yielded no Piping Plovers. Although there are reports of one plover in 1981 and a single adult and one pair with flightless young in 1982, lack of any plovers on the first thorough survey indicate this area is not

consistently used.¹

Conservation Action Conservation benefits of the 1991 census are assured. Critical Piping Plover breeding habitat throughout Saskatchewan has been determined and mapped.²⁴ Habitat was designated as critical if the beach was used by one or more pairs in at least one year since 1984, and it seemed reasonable to expect repeat use. In most cases, designations are the result of 1991 surveys.

The critical habitat information has been transferred to the Saskatchewan Department of Natural Resources Geographic Information System (GIS). The GIS is currently being used in many areas of resource management in Saskatchewan. This ensures that the critical habitat information for Piping Plovers, along with other species, is widely available to make conservation decisions concerning specific locations.

Follow-up work to understand the effect of water level changes at Lake Diefenbaker was begun by SWB in 1991, and continued in cooperation with the University of Regina and CWS in 1992. SWB and CWS have also initiated a dialogue with Sask Water Corp about including Piping Plover in water management planning. Also, North American Waterfowl Management Plan (NAWMP) partners are incorporating benefits to Piping Plovers and other shorebirds, as well as ducks and geese, in NAWMP projects.

Further action could include long-term productivity studies at other basins, developing rotational grazing systems with land owners which keep cattle off beaches during the breeding season, and reducing or eliminating other identified threats to

plover habitat.²⁴ Perhaps, as a future step, all landowners with critical Piping Plover habitat may be made aware of its significance and develop an interest in protecting plover habitat, and thereby help ensure its recovery on the Prairies.

Acknowledgements This project was made possible through the financial support of the Endangered Species Recovery Fund (ESRF; funded by World Wildlife Fund, CWS and Outdoor Canada/Sportsmen Shows), Elsa Wild Animal Appeal, CWS, USFWS, and Saskatchewan Natural History Society (SNHS). Invaluable logistical and manpower contributions were provided by SWB of Saskatchewan Natural Resources, as well as CWS, USFWS, and SNHS.

We would like to thank the many people who conducted the survey work, including the biologists from SWB (15), CWS (6) and USFWS (6), the contract biologists (12) and the more than 80 volunteers. We thank J.P. Goossen, S.P. Fleming, W.C. Harris and C. Schroeder for their comments on an earlier draft of this manuscript. We also are grateful to W.C. Harris for encouragement to complete this manuscript.

Participants in the survey were: Stuart Alexander, Bill Anaka, Joyce Anaka, Alan Arsenault, Syd Barber, Keith Barr, Sam Barry, Tom Bartlett, Myron Barton, Neva Bayliss, Rhys Beaulieu, Margaret Belcher, Pat Bergstrom, Lionnel Bonneville, Stefan Bonneville, John Bord, Ed Brochmeyer, Dorothy Brown, Paul Burke, Gary Carlson, Muriel Carlson, Paul Chytyk, Mike Crofts, Ben Cruise, Ryan Csada, Arnold Dast, T. C. Dauphine, Doug Dean, John Dep-tuch, Brett Diemert, Ken Dillabaugh, Dwight Dobson, Carman Dodge, Ed

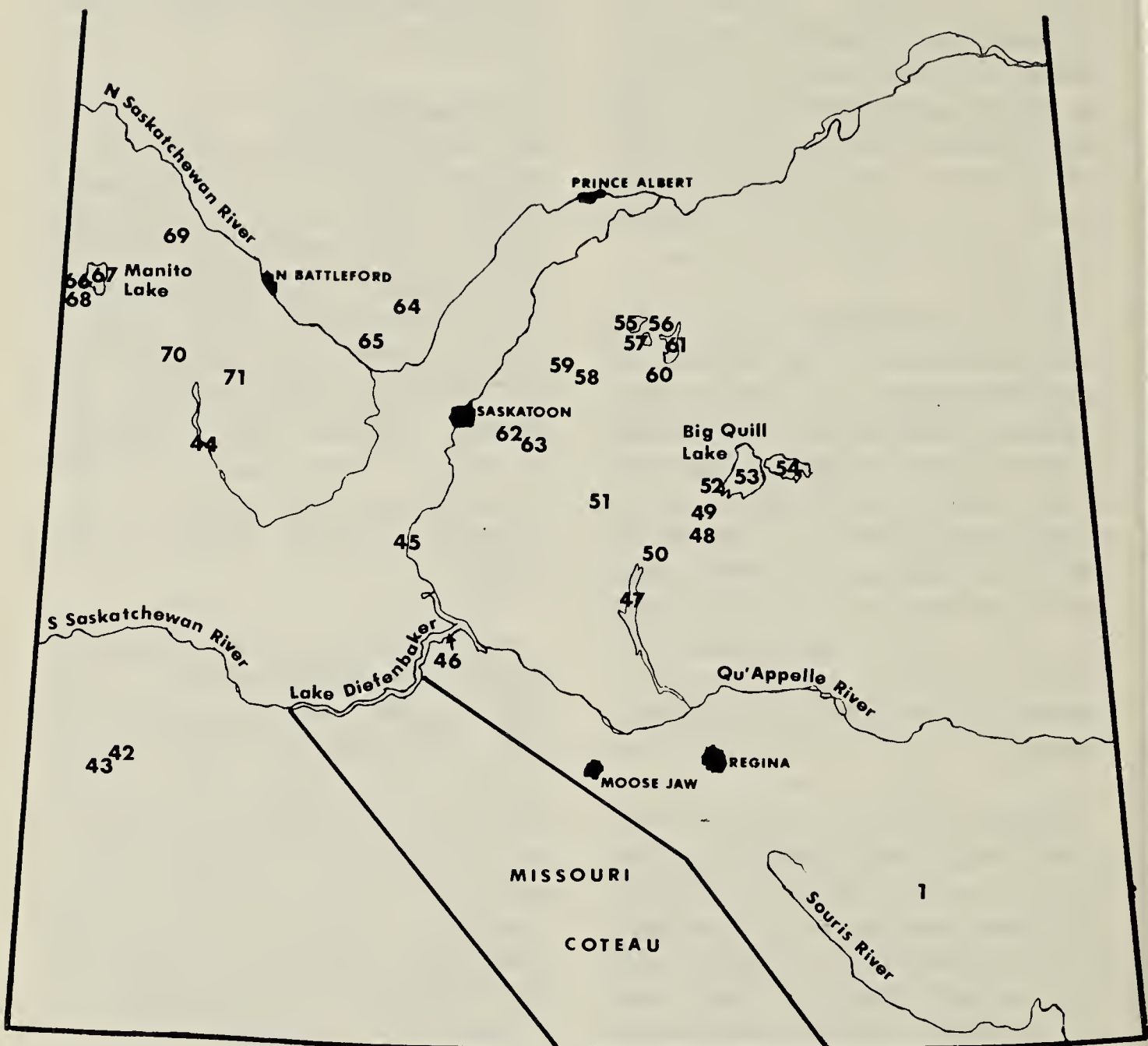


Figure 1. Piping Plover locations, excluding the Missouri Coteau.

Driver, Margaret Driver, Chris Dunn, Jim Elliott, Kay Ferguson, Mary Ferguson, Kim Finley, Jane Forster, Hartley Fredeen, Bernie Gollop, Mike Gollop, Stuart Golly, J. Paul Goossen, Russell Griffith, J. Gorham, Al Gurnsey, Wayne Harris, Cathy Harron, Don Harron, Howard Harter, Gordon Herterman, Merv Hey, Dale Hjertaas, Paule Hjertaas, Warren Hjertaas, Jim Hutchinson, Phyllis Ilsley, Grev Jones, Matina Kalcounis, Elaine Konkin, Fred Konkin, Wally Kost, Bob Kreba, Glen

Kurjata, Anne Lambert, Tim Lash, Ella Leiter, Rudi Leiter, Bob Luterbach, Michael MacKay, Ron MacKay, R. Marvin, Susan McAdam, Don McDonald, Yvonne McKenzie, Karen McKeown, Richard Miller, Shirley Miller, Brad Muir, Craig Palmer, Cheryl Penny, David Peters, Dave Phillips, Karen Pretzer, Mark Pretzer, Sharon Procyshyn, Sandra Reyers, Laura Robinson, Allan Rokosh and 1st Ituna Boy Scouts, Jacques Saquet, Lloyd Saul, Dan Sawatzky, Adam Schmidt, Jeffrey

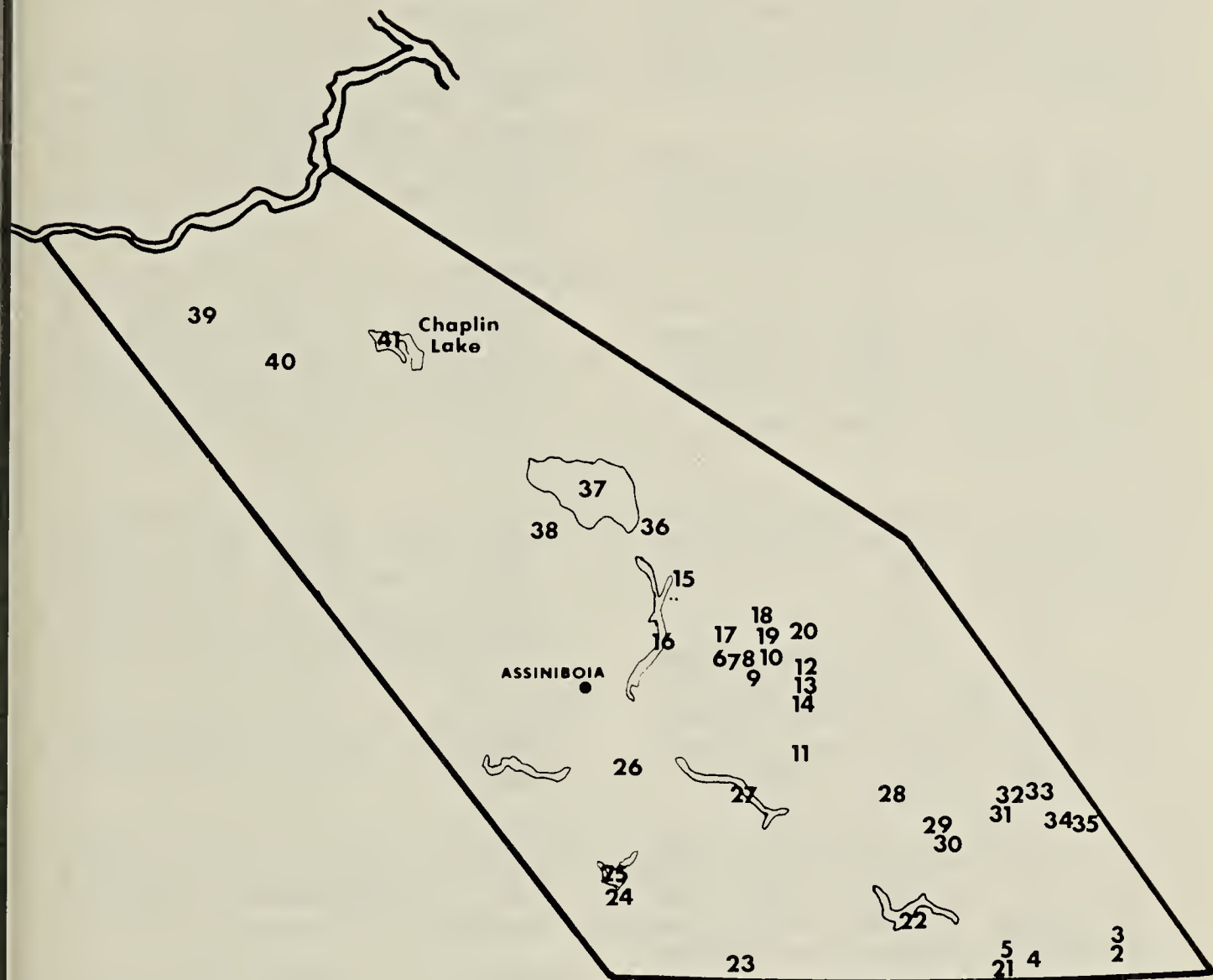


Figure 2. Piping Plover locations in the Missouri Coteau.

Schnurr, Margaret Skeel, Alan Smith, Roy Smith, Bill Stern, Paul Stevel, Bob Stratton, Frank Switzer, Monica Tan, Doug Taylor, Tim Trottier, Ed Walker, Jim Wedgwood, Shirley Wedgwood, Anne Weerstra, Bryne Weerstra, Don Weidl, Michael Williams, Jim Wood, Lois Wooding, Milow Worel and Steve Young.

1. ADAM, C.I.G. 1984. Piping Plover, *Charadrius melodus*, at Lake Athabasca, Saskatchewan: a significant northward range extension.

Canadian Field-Naturalist 98:59-60.

2. BELL, F.H. 1978. Status report on Piping Plover in Canada. Report for the National Museums of Canada and the Committee on the Status of Endangered Wildlife in Canada. 39 pp.
3. BENT, A.C. 1929. Life histories of North American shore birds, Part Two. Dover, New York. 412 pp.
4. CAIRNS, W.E. and I.A. MCLAREN. 1980. Status of the Piping Plover on the east coast of North America. *Am. Birds* 34:206-208.

5. FERRY, J. 1910. Birds observed in Saskatchewan during the summer of 1909. *Auk* 27:185-204.
6. GOOSSEN, J.P. 1990. Piping Plover research and conservation in Canada. *Blue Jay* 48:139-153.
7. HAIG, S.M. 1985. The status of the Piping Plover in Canada. Report to the Committee on the Status of Endangered Wildlife in Canada. National Museum of Natural Sciences, Ottawa. 34 pp.
8. HAIG, S.M. and J.H. PLISSNER. 1992. The 1992 international Piping Plover census. U.S. Fish and Wildlife Service, Twin Cities, MN. 200 pp.
9. HARRIS, W.C. 1988. Piping Plover survey - 1988: South Saskatchewan River - Lake Diefenbaker segment (Riverhurst Ferry to the Dams). Sask. Natural History Society. Unpub. 10 pp. plus map.
10. HARRIS, W.C. and S.M. LAMONT. 1985. Big Quill Lake Piping Plover populations - 1985. Potash Corp. of Sask. Unpub. 24 pp.
11. —. 1989. Saskatchewan Piping Plover surveys - 1989: Big Quill Lake, Lake Diefenbaker and Redberry Lake. Sask. Natural History Society. 18 pp. plus appendix and maps.
12. —. 1990. Saskatchewan Piping Plover population assessment - 1990: Big Quill Lake, Chaplin Lake, Lake Diefenbaker, Redberry Lake and the South Saskatchewan River (Gardiner Dam to Saskatoon). Sask. Environmental Society. Unpub. 15 pp. plus appendix.
13. —. 1991. Saskatchewan Piping Plover population assessment - 1991: Big Quill Lake, Chaplin Lake, Lake Diefenbaker, Redberry Lake and the South Saskatchewan River (Gardiner Dam to Saskatoon). Sask. Environmental Society and Canadian Wildlife Service. Unpub. 32 pp. plus maps.
14. HARRIS, W.C., S.M. MCADAM and D.A. WEIDL. 1987. Chaplin Lake, Saskatchewan, Piping Plover census and habitat evaluation. Sask. Natural History Society and Sask. Parks and Renewable Resources. Unpub. 8 pp.
15. HARRIS, W.C., G. WAPPLE, R. WAPPLE, K. DESMET and S.M. LAMONT. 1985. Saskatchewan Piping Plovers - 1984. Sask. Natural History Society and Sask. Parks and Renewable Resources. Unpub. 106 pp. plus appendix.
16. HJERTAAS, D. 1991. 1990 Piping Plover distribution and monitoring survey of three regions in south central Saskatchewan, Sask. Natural History Society. Unpub. 24 pp.
17. JOHNSON, R.H. and A.C. SEGUIN. 1989. 1989 Piping Plover distribution and monitoring survey of three regions in south central Saskatchewan. Sask. Natural History Society. Unpub. 39 pp.
18. KERBES, R.H. and J.L. HOWARD. 1986. Summary of bird studies and management recommendations for the Redberry Lake area. Canadian Wildlife Service and Sask. Parks and Renewable Resources. Unpub. 14 pp.
19. PURDY, M.A. and B.J. WEICHEL. 1988. Piping Plover survey: South Saskatchewan River - Red Deer confluence to Miry Bay and Gardiner Dam to Saskatoon. Sask. Natural History Society. Unpub. 13 pp.
20. RENAUD, W.E. 1974. Nesting Piping Plover in Saskatchewan. *Blue Jay* 32: 158-162.
21. RENAUD, W.E., G.J. WAPPLE, and D.W. EDGETT. 1979. The Piping Plover in Saskatchewan: a status report. *Blue Jay* 37:90-103.
22. SKEEL, M.A. 1990a. Areas in Saskatchewan previously searched for Piping Plovers. Sask. Natural History Society. Unpub. 20 pp.
23. —. 1990b. Potential basins to search for Piping Plovers in Saskatchewan in 1991. Unpub. 15 pp.
24. —. 1991. The 1991 International Piping Plover Breeding Census - Saskatchewan. Sask. Natural History Society. Unpub. 69 pp. plus maps.
25. —. In prep. The 1991 Piping Plover census in Saskatchewan. In S. P. Fleming, ed. The 1991 International Piping Plover Census in Canada. Canadian Wildlife Service.
26. WEIDL, D.A. 1986. Piping Plover survey - 1986. Unpub. report. 9 pp.

Table 1. SASKATCHEWAN SITES WITH PIPING PLOVERS IN 1991

No.	Date	Water level	Site ^a	No. birds	No. pairs	% habitat ^b
1	02 June	low	Rock Lake	1	0	100
2	05 June	normal	613 345 (&2H1)	7	3	100
3	05 June	normal	Sandoff Lake	25	8	95
4	13 June	normal	East Coteau Lake	23	10	100
5	13 June	high	West Coteau Lake	7	3	100
6	10 June	low	Dryboro Lake	5	3	100
7	07 June	low	650 075 (72H11)	2	0	95
8	07 June	low	Burn Lake	4	2	95
9	07 June	low	705 056 (72H11)	15	7	97
10	10 June	low	Shoe Lake	4	2	92
11	05 June	low	Channel Lake	19	5	90
12	08 June	low	840 020 (72H11)	8	3	100
13	08 June	low	842 003 (72H11)	2	0	80
14	08 June	low	846 020 (72H11)	4	2	100
15	08 June	low	540 279 (72H11)	11	5	90
16	07 June	low	Lake of the Rivers	6	2	100
17	03 June	normal	Bliss Lake	3	1	100
18	06 June	low	Skyeta Lake	2	1	95
19	06 June	low	Oro Lake	1	0	100
20	09 June	low	842 162 (72H14)	2	1	90
21	06 June	normal	Lonetree Lake	2	1	100
22	07 June	low	Big Muddy Lake	26	8	95
23	09 June	normal	Coronach Reservoir	5	1	100
24	08 June	low	Grant Lake	1	0	100
25	13 June	normal	Fife Lake	29	9	100
26	12 June	low	Montague Lake	4	1	100
27	10 June	low	Willow Bunch Lake	31	16	100
28	06 June	low	Edna Lake	7	4	95
29	03 June	low	McGrath Lake	1	0	100
30	03 June	low	Salt L (72H7)	1	0	100
31	05 June	low	Elsie Lake	15	6	100
32	06 June	low	McDonaugh Lake	11	4	100
33	06 June	low	360 717 (72H7)	1	0	100
34	05 June	normal	514 656 (72H8)	3	0	100
35	05 June	normal	Karl Lake	2	1	100
36	06 June	low	Frederick Lake	12	5	90
37	12 June	low	Old Wives Lake	42	17	100

No.	Date	Water level	Site ^a	No. birds	No. pairs	% habitat ^b
38	07 June	low	170 394 (72J1)	1	0	100
39	06 June	low	Handsome Lake	1	0	40
40	11 June	normal	Reed Lake	1	0	100
41	11 June	high	Chaplin Lake	113	15	100
42	27 May	normal	Freefight Lake	5	2	100
43	27 May	normal	Ingebright Lake	2	1	60
44	08 June	low	Tramping Lake, s end	2	1	50
45	04 June	low	middle S Sask. R	1	0	100
46	13 June	low	Lake Diefenbaker	276	122	97
47	11 June	low	Last Mountain Lake	9	3	95
48	10 June	low	Kutawagan L complex	8	3	100
49	07 June	low	Lac du Chemin	5	2	100
50	09 June	normal	Colt Lake	4	2	100
51	10 June	normal	Little Manito Lake	28	12	100
52	01 June	normal	247 380 (72P15)	1	0	100
53	14 June	low	Big Quill Lake	151	54	90
54	06 June	normal	Little Quill Lake	13	5	100
55	03 June	low	Basin Lake	4	1	95
56	04 June	low	Elkona Lake	5	3	100
57	10 June	low	Middle Lake	4	1	100
58	04 June	normal	Muskiki Lake	11	5	100
59	16 June	low	Buffer Lake	3	2	95
60	04 June	low	Houghton Lake	7	3	100
61	03 June	low	Lenore Lake	9	4	75
62	04 June	normal	103 667 (73B1)	2	1	100
63	14 June	normal	155 642 (73B1)	1	1	75
64	05 June	normal	Redberry Lake	21	11	100
65	04 June	normal	Radisson Lake	5	0	100
66	04 June	normal	964 390 (73C12)	3	1	100
67	07 June	normal	Manito Lake	111	51	100
68	04 June	low	West Reflex Lake, SK	5	2	100
69	08 June	low	Lambert Lake	4	2	100
70	04 June	low	Killsquaw Lakes	4	1	80
71	11 June	normal	Aroma Lake	8	3	100
Total				1,172		481

^a Unnamed sites are identified by universal Transverse Mercator (UTM) grid number and map sheet.

^b Percent of estimated Piping Plover habitat that was censused.