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**MINNESOTA BURROWING OWL CONSERVATION
1990 REPORT**

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INTRODUCTION

The Raptor Center at the University of Minnesota (TRC) and the Minnesota Department of Natural Resources Nongame Program (TNGP) began their sixth year of Burrowing Owl conservation activities in 1990. Research, management, and education continued to be the foci of the project. Research activities designed to study the natal-return rate, nest-site fidelity and location of wintering grounds were begun in South Dakota and Minnesota. Locating and documenting all nestings in Minnesota remained a top priority. Reintroduction of owls, which began in 1985, was continued at a new hack site in Rock County. Use of the Lac Qui Parle County site was discontinued since most of the known Burrowing Owl nests used since 1988 were located in Rock (4) and Pipestone (2) Counties (Table 1).

Funding was provided by TNGP and TRC. Badlands National Park (South Dakota) provided logistic assistance. Fieldwork was assisted by Charlene Gieck, Bruce Bessken and Mary Henry. Advice and assistance were provided by Harrison Tordoff, Francie Cuthbert, Lee Pfannmuller and Patrick Redig. Additional assistance was provided by Eileen Dowd and others at South Dakota Game Fish and Parks Dept., Bruce Bessken and others at Badlands National Park, as well as personnel at the Nebraska National Forest (South Dakota) and Blue Mounds State Park (Minnesota). Trudi Hahn provided valuable comments and editorial advice on this report for which we are grateful.

RESEARCH

METHODS

South Dakota

Surveys to locate nesting Burrowing Owls were conducted in Badlands National Park (BNP) and on the Buffalo Gap National Grassland (BGNG) (in Bloom Basin north of BNP and in the Conata Basin south of BNP) both in western South Dakota. Surveys were also conducted on the Ft. Pierre National Grassland (FPNG) in central South Dakota. Twenty-two sites were surveyed in western South Dakota (Fig. 1; Table 2) and 11 were surveyed in FPNG (Table 3).

In order to get the best estimate of the number of owls, all readily accessible prairie dog towns on the BGNG were searched. Active towns were given a site number and scanned from vantage points at the edge or inside of the town. The observers chose as many points as needed to cover the whole town visually. Observations were made from inside a vehicle; the time at each stop varied according to the observers' need for thorough coverage. Any owls seen during banding or while walking through the towns were also recorded. The location of all nesting owls were recorded on USGS maps.

Two sections of the Sage Creek Wilderness Area in BNP (sites 20a and 20b, Table 2) were surveyed from horseback 29 and 30 June. Four observers rode through the prairie dog towns checking the entire area with binoculars and spotting scopes. When owls

were found, their location was recorded on USGS maps.

To determine the most effective survey technique for future population monitoring, various protocols were tested. Three of the larger sites in BGNG (#2, 4, 6 Table 2) were chosen for repeated surveys. Transects were established with observation points every 0.32 km (0.2 mi). Two observers, located inside a vehicle, scanned an area with an estimated radius of 100 m around the observation point with binoculars. The observers remained at each stop for 10 min and recorded observations at 0, 3, 6, and 10 min. These surveys were conducted between 23 and 26 June. Sites # 2 and 4 were surveyed twice at dusk and once at dawn, and site #6 was surveyed once at dawn. Surveys had to be cancelled or shortened at other times for safety reasons because of prairie dog hunting on the sites.

Trapping of immature birds on BGNG was done using Haug traps (Martell 1990) on various days between 28 June and 13 July. They were banded with U.S. Fish and Wildlife Service bands on one leg and a yellow leg band on the other leg.

The FPNG sites were surveyed from 7 to 10 July from vehicle and on foot, both systematically and during trapping and banding of owls. During this same period we trapped, banded and color-marked juvenile owls, and trapped and relocated owls to Minnesota.

Minnesota

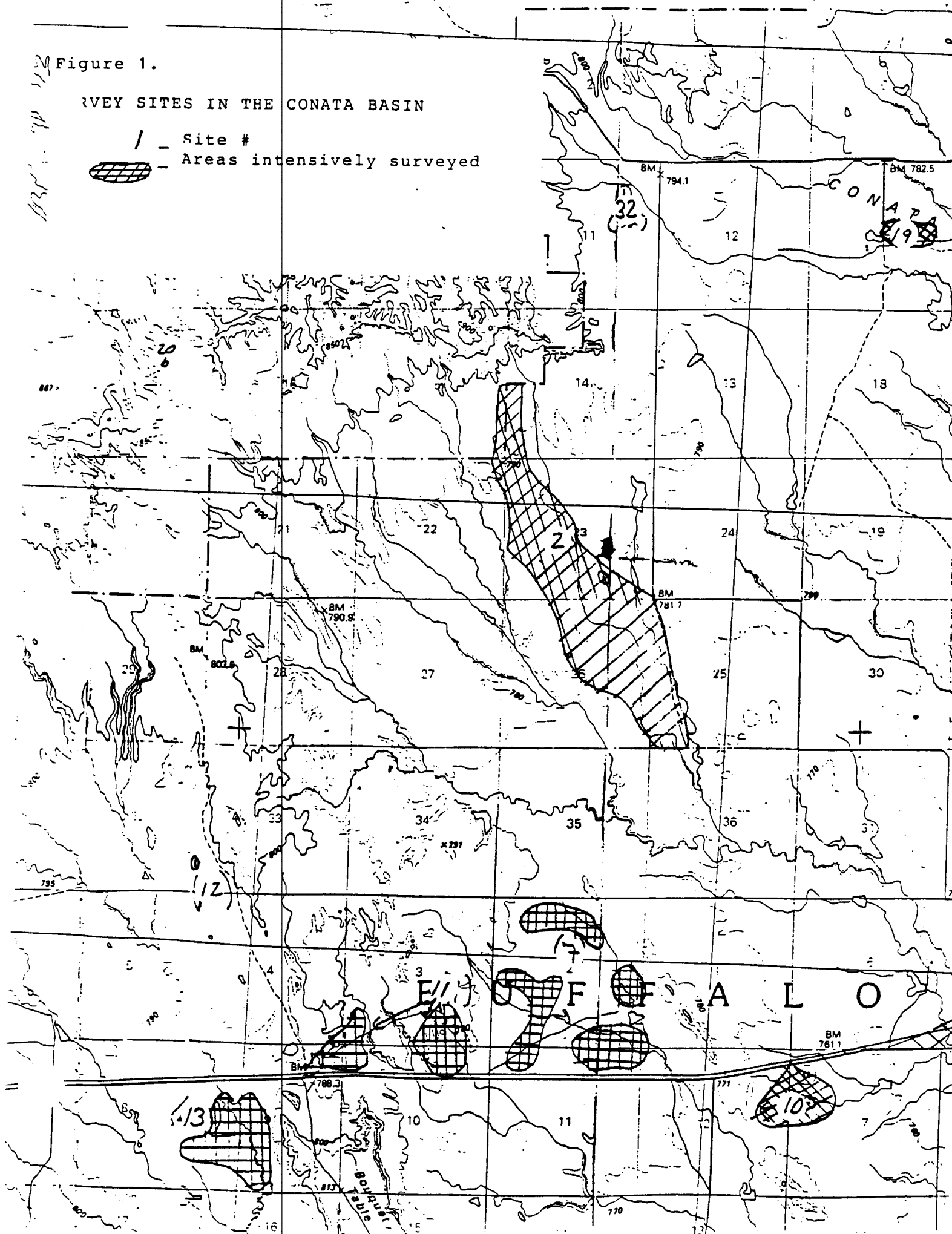
All Burrowing Owl nest sites used during the 1980s and the hack site at Lac Qui Parle were checked at least once for returning or nesting owls. Copies of the "Have you seen these owl" poster were distributed and 20,000 8in x 11 in versions were mailed by TNGP to households in the southwest and northwest regions. We attempted to trap all known wild fledged Burrowing Owls in Minnesota for banding. These birds were banded with a U.S. Fish and Wildlife Service band and a green leg band.

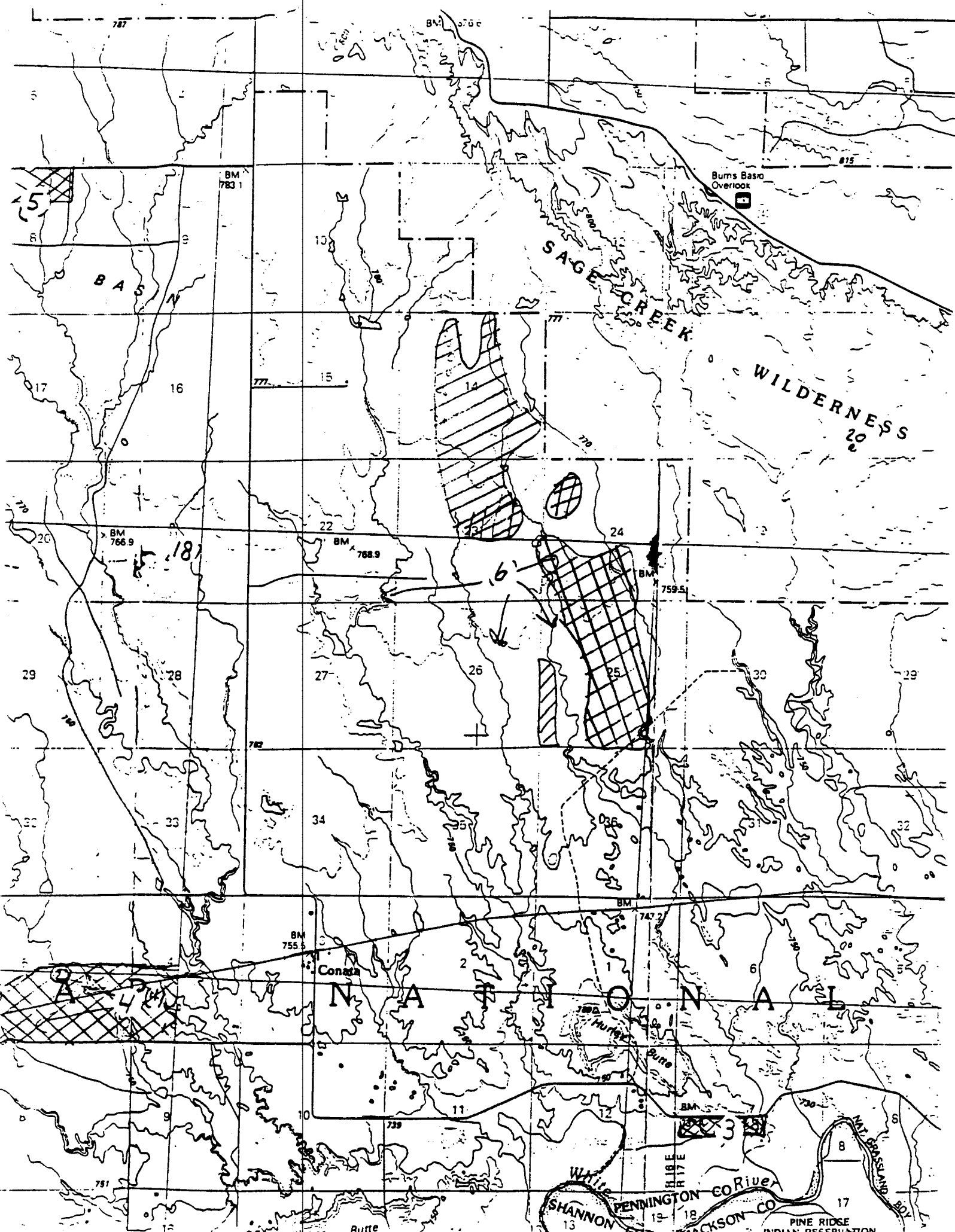
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SURVEY SITES IN THE CONATA BASIN

/ Site #

 - Areas intensively surveyed





RESULTS AND DISCUSSION

South Dakota

One pair of owls with five young was found in the Bloom Basin. This was a dramatic decline from the summer of 1989, when we found large numbers of owls at most of the prairie dog towns in the area. Poisoning of the prairie dog towns in the fall of 1989 may have been responsible for this decline. We found very few prairie dogs, and many of the burrows had collapsed, probably trampled by cattle.

Forty adult and 47 immature owls were counted at towns in the Conata Basin (Table 1). This represented a possible 23 pairs of owls. Twenty-five of the immature owls were banded and color-marked with a yellow leg band.

Forty-five adult owls, with 61 young, representing 35 to 38 pairs were counted on FPNG. Six of the immature owls were banded and color-marked with a yellow leg band. Thirty immature owls were relocated to Minnesota.

These results must be interpreted very carefully as 1990 was a "pilot year" for this study. We were checking a variety of techniques and did not spend equal amounts of time at each site. The presence of prairie dog hunters greatly hindered our ability to carry out complete surveys and prevented us from repeating them on the schedules we had devised.

Minnesota

Three nesting pairs of Burrowing Owls were documented in Minnesota this year, all in Rock County (Table 4). None of the adults carried any leg band or color markers. Two of the pairs nested in or near burrows used in past years (Rock 1, and Rock 3) and the third nested at a new site. The pair at Rock 3 nested in a wooden artificial burrow we placed at the site in 1989. A total of 13 immatures were seen at these sites, and 11 were banded and color-marked using green leg bands.

MANAGEMENT

Reintroduction -----

Thirty juvenile Burrowing Owls were trapped on FPNG 6 to 9 July 1990 for reintroduction into Minnesota. All of the birds were banded with a U.S. Fish and Wildlife Service band and a combination of two colored leg bands - red, green, or yellow. The color bands served to identify individuals at the hack site, both pre-, and post-release. The owls were transported to the hack site in Minnesota on 10 July.

A new hack site was established this year in Rock County on a privately owned pasture in section 19 of Mound township. The site was prepared by erecting two hack pens modeled after the ones used at the Lac Qui Parle hack site (Martell 1990) and an observation blind. Three artificial burrows (Henderson 1984) were placed in each pen. Due to the lack of natural burrows, three artificial burrows were placed along the south fence line (bordering a soybean field), and one along the east fence line (bordering a corn field) of the pasture. The blind was set up 50 m from the pens.

Birds were fed dead laboratory mice, sparrows, and starlings twice a day while they were in the hack pen and once a day after release. Food was placed inside the pens on .5 m x .5 m hack boards. Fifteen juvenile owls and one crippled adult owl (from TRC) were placed in each pen on 10 July. We attempted to place

the youngest owls with the adult female.

During pre-release examinations we removed eight color bands that were causing constriction and swelling of the legs. Most of the problems were caused by the top color band on a double-banded leg. None of the injuries was serious enough to result in permanent damage. One of the owls sustained a hock injury and was kept for 24 hr observation, then placed with the adults for three days and released 19 July.

Prior to release we found four birds trapped between the outside of the wall of the artificial burrow and the soil. Another juvenile was found buried alive upside down under 8 in of soil, beneath the cover of a burrow. It is not known how this owl became trapped, or for how long, but the bird was freed and returned to the pen. The adult female and six other juveniles trapped themselves inside another burrow; all of them were safely removed. No serious injuries were sustained in any of these instances. We believe they did this burrowing in response to our presence in the pens.

The adults were moved to a small pen and the juveniles released on 16 July. On 30 July the adult female owl escaped and flew away. The adult male owl was brought back to TRC on 9 August. Feedings and observations were continued on a daily basis for 31 days post-release, until 17 August. Feedings were cut back to every other day for two weeks after this.

Positive identifications were made at least three times on 29 birds, while seven owls were identified more than 10 times.

Twenty-two owls (73%) were accounted for at least 14 days post-release, and 10 owls (33%) were seen at least 21 days post-release. After 6 August the numbers of owls seen dropped rapidly from 10 on 6 August to one on 8 August. At least one bird remained in the area until September. The reintroduced birds' disappearance coincided with the disappearance of fledglings at the wild nests.

Two mortalities to released birds were recorded in 1990 (Table 5). Feather remains from a Burrowing Owl were found 25 July. We believe that the owl was killed by a Red-tailed Hawk (Buteo jamaicensis) that had been seen on many occasions in the pasture and around the farm. The whole carcass of a Burrowing Owl was found on a path between the farm and the pasture on 31 July. We attributed this death to a feral farm cat. Cats were seen at the hack site twice after this. Feathers of a Great Horned Owl (Bubo virginianus) were found near the hack boards on 13 August, although unlike past years, we recorded no mortality due to Great Horned Owls.

We consider the 1990 reintroduction a qualified success. Thirty birds were released and only two mortalities were noted. Only one bird was not seen after release. Successful hunting and feeding was observed. Pellet examinations showed a high amount of beetles and grasshoppers being taken. Those owls that moved from the hack site to the far end of the pasture ate almost completely wild-caught insects and mammals.

Only 33% of the released birds were still coming to the hack site 3 weeks after their release. This compares with 78% of the birds being seen 33 days post-release in 1987, and 95% being seen 25 days post-release in 1988. All of the birds released in 1988 were still at the hack site 14 days after release, while in 1990 73% were present at that time. Since the wild produced young disappeared at the same time we do not know if this apparent early departure from the hack site is a cause of concern.

LITERATURE CITED

- Henderson, Carrol L. 1984. Woodworking for wildlife. Minnesota
Department of Natural Resources. 47 pp.
- Martell, Mark S. 1990. Burrowing Owl reintroduction in Minnesota:
a feasibility study. Minneapolis; Univ. of Minnesota;
Thesis, 95 p.

Table 1.

BURROWING OWL NESTS IN MINNESOTA
1987 - 1990

County	Location	Habitat	Number of Young			
			1987	1988	1989	1990
Pipestone	T108N R44W S30	Alfalfa	≥ 3	≥ 3	≥ 3	
Pipestone	T105N R45W S20	Roadside		≥ 3		
Rock	T103N R45W S7	Pasture		≥ 2	5	≥ 2
Yellow Medicine	T115N R44W S8	Fenceline		≥ 2		
Traverse	T126N R47W S24	Pasture		≥ 2		
Rock	T103N R47W S13	Alfalfa			8	7
Rock	T104N R44W S15	Pasture			2	
Rock	T103N R45W S19	Alfalfa				5

Table 2

BURROWING OWLS SEEN AT SITES IN WESTERN SOUTH DAKOTA

Town # and Location	# of Adults	# of Pairs	# of Young	# Banded
1 T2S R16E S12	2	1	5	0
2 T3S R15E S23	2	1	6	2
3 T4S R17E S7	9	5	9	9
4 T4S R16E S4,5	2	2	7	2
5 T3S R16E S8	9	6	9	8
6 T3S R16E S22,23,24,25,26	4	3	0	0
7 T4S R15E S2	0	0	0	0
8 T1S R15E S3	1	?	0	0
9 T1S R16E S26	1	0	0	0
10 T4S R16E S7	0	0	0	0
11 T4S R15E S3	1	0	0	0
12 T4S R15E S4	2	1	1	0
13 T4S R15E S8,9	0	0	0	0
14 T4S R14E S12	0	0	0	0

Table 1. (cont.)

Town # and Location	# of Adults	# of Pairs	# of Young	# Banded
15 T4S R15E S11	0	0	0	0
16 T3S R14E S31	0	0	0	0
17 T3S R13E S24	0	0	0	0
18 T3S R16E S21	2	1	5	0
19 T3S R16E S7	6	3	7	4
20(a) T3S R17E S17,19,20	1	1	0	0
20(b) T2S R15E S28,33,34	1	1	0	0
32 T3S R16E S11	1	1	3	0

Table 3

BURROWING OWLS SEEN AT SITES

IN THE FT. PIERRE NATIONAL GRASSLAND, SOUTH DAKOTA

Town # and Location	# of Adults	# of Pairs	# of Young	# Banded *
21 T1N R31E S33	4	4	0	0
22 T109N R79W S7-18	7	3	2	0
23 T109N R79W S25	5	7-10	25	2
24 T109N R77W S33	4	3	4	1
25 T109N R77W S20	4	3	7	1
26 T109N R77W S20	4	2	5	1
27 T109N R78W S24,25	4	3	2	0
28 T109N R79W S30	4	3	8	0
29 T108N R78W S24	4	4	0	0
30 T109N R78W S28	5	3	8	1
31 T109N R78W S25	0	0	0	0

* 30 owls banded and removed to Minnesota not included in this table

Table 4

MINNESOTA BURROWING OWL NEST SITES ACTIVE IN 1990

Rock 1 (T103N R45W S7 (SW SE))

HABITAT Rocky pasture surrounded by pasture land.

YEARS OF ACTIVITY 1988, 1989, 1990

NUMBER OF YOUNG SEEN 1988 - 3, 1989 - 5, 1990 - 2

NUMBER OF YOUNG BANDED 1989 - 3, 1990 - 0

NOTES The pair at this site in 1990 included a very light colored male as it had the previous two seasons. A different female was probably in attendance as we believe that owl remains found at the nest burrow in 1989 were from the female of that years pair. The two young had fledged when we went to band them. It appears that the same burrows located near a rock outcropping were used in all years.

Rock 3 (T103N R47W S13 (SE SE))

HABITAT Alfalfa field (now enrolled in the annual set-aside program)

YEARS OF ACTIVITY 1989, 1990

NUMBER OF YOUNG SEEN 1989 - 8, 1990 - 7

NUMBER OF YOUNG BANDED 1989 - 8, 1990 - 7

MISC. The burrow used last year collapsed and the pair moved to a wooden artificial burrow we installed last fall about 20 m to the west. The plucked feathers of an adult Burrowing Owl were found near the burrow entrance on 14 July.

Table 4 (cont.)

Rock 4 T103N R45W S19

HABITAT Alfalfa field

YEARS OF ACTIVITY 1990

NUMBER OF YOUNG SEEN 4

NUMBER OF YOUNG BANDED 4

MISC. This site is located about 1 km to the west of the hack
site and about 1.25 mi south of Rock 1.

Table 5.

DISPOSITION OF RELEASED OWLS

1990

BAND #	COLOR MARKERS		LAST CONTACT DATE	DAYS OF SURVIVAL
	Rt.	Lt.		
01	s	g/y	07/30/90	15
			Found dead (RTH) on 07/31/90 at HS	
02	g/y	s	08/05/90	21+
03	g/s	y	08/02/90	18+
04	y	g/s	08/05/90	21+
05	y/s	g	07/22/90	10+
06	g	y/s	07/31/90	15+
07	s	r	08/05/90	21+*
08	r	s	08/06/90	22+
09	s	r/g	07/30/90	15
			Found dead (Feral Cat) on 07/31/90	
10	s	r/y	07/17/90	2+
11	r/g	s	08/07/90	23+
12	r/y	s	07/08/90	3+
13	r/s	y	07/25/90	10+
14	g/y	r/s	08/06/90	22+
15	g/s	r/y	07/21/90	6+
16	r	g/s	08/02/90	18+
17	s	r	08/05/90	21+*
18	g/r	y/s	08/05/90	21+
19	s	y/g	08/01/90	17+
20	y/g	s	08/02/90	18+*
21	g/r	s	08/08/90	25+
22	s	g/r	07/30/90	16+
23	s	y/r	07/22/90	8+
24	y/r	s	07/22/90	8+
25	r/s	y/g	07/30/90	16+*
26	y/g	r/s	08/01/90	17+
27	g/s	y/r	07/16/90	1+
28	y/r	g/s	08/06/90	22+
29	r/s	y/g	07/30/90	15+*
30	y/g	s	08/02/90	17+*

ALL OWLS RELEASE 7/16/90, EXCEPT 07 RELEASED 7/19/90
 r = red, y = yellow, g = green, s = silver (USFWS band)
 + = Bird was last seen alive
 * = Bird has the same color combination as another bird