

Results of an Observation Card Survey for
Eastern Greater Sandhill Cranes in Minnesota for 1977.

Section of Wildlife
Division of Fish and Wildlife
Department of Natural Resources
390 Centennial Building
St. Paul, Minnesota 55155

November 21, 1977

Acknowledgments

This survey was first proposed by Area Wildlife Manager Larry Bernhoft at Baudette, and it represents an inter-agency effort involving persons from the United States Fish and Wildlife Service, the United States Forest Service, The Nature Conservancy, the University of Minnesota at Crookston, the University of Minnesota at Minneapolis, St. Cloud State University, the United States Soil Conservation Service, and the Department of Natural Resources. Within the Department of Natural Resources, field personnel from the Divisions of Forestry, Ecological Services, Enforcement and Fish and Wildlife all submitted sighting data. Grateful appreciation is extended to everyone who contributed crane sighting cards and to the various agency managers who facilitated the coordination and implementation of this extensive effort. A list of persons who submitted crane observation cards is included in Appendix 1.

Methods

In 1977, the Minnesota Department of Natural Resources initiated a nongame wildlife program within the Division of Fish and Wildlife. One of the first goals of that program has been to assess the current status and distribution of the greater sandhill crane in Minnesota so that appropriate research and management efforts can be directed toward this important species as more nongame funding becomes available.

An observation program was established in cooperation with field personnel of the Department of Natural Resources, United States Fish and Wildlife Service, United States Forest Service, the University of Minnesota, St. Cloud State University, and the Nature Conservancy. Observers were supplied with key-sort observation cards to fill out each time that cranes were observed. They were instructed to submit completed cards to the nongame supervisor in St. Paul on May 1, August 1, and December 1. A copy of the card and the accompanying instructions are given in Appendix 2.

Results

Cooperation has been excellent in the first year of this program's operation. Observers have submitted 135 crane observation cards and reported seeing a total of 2,440 cranes in 1977. During the spring migration period in March and April there were 19 sightings totaling 1,371 birds. From May through August, there were 105 sightings totaling 656 cranes, and in September and October there were 11 sightings totaling 2,409 cranes. The statewide distribution of sightings of summer resident cranes is shown in Figure 1 by township.

Discussion

Breeding greater sandhill cranes now occur in Minnesota in at least fourteen counties in two separate regions: the northwest and the east central.

Table 1. Summary of resident sandhill cranes observed in northwest Minnesota in 1977, by county.

<u>County</u>	Northwest Population		
	<u>Breeding Pairs</u>	<u>Young</u>	<u>Nonbreeders</u>
Becker	0	0	0
Beltrami	17	18	55
Lake of the Woods	6	2	0
Mahnomen	0	0	0
Marshall	15	7	23
Kittson	1	1	15
Pennington	1	2	0
Polk	2	1	12
Roseau	19	18	84
	<hr/> 61	<hr/> 49	<hr/> 189

In the northwest region cranes nest in Beltrami, Lake of the Woods, Mahnomon, Marshall, Kittson, Pennington, Polk, and Roseau Counties. Sightings documented the occurrence of 61 breeding pairs which produced at least 49 young. Non-breeding birds present through the summer totaled 189, so the total fall count of resident cranes in the northwest would be a minimum of 360. Since much of the sandhill crane nesting habitat in the northwest is in inaccessible bog country, the actual population could easily range from 500 to 1000 resident birds. A summary of the cranes observed by county in 1977 is shown in Table 1.

A low density and dispersed breeding population of sandhill cranes also occurs in seven counties of east central Minnesota. These counties include Anoka, Aitkin, Kanabec, Mille Lacs, Morrison, Pine, and Sherburne. Observers reported seeing 15 breeding pairs which produced 12 young, and 12 nonbreeding birds were also seen. The total fall count would then be 54 sandhill cranes. If 25 percent to 50 percent of the cranes present were observed, as was assumed for the northwest, then the total east central population could contain from 100 to 200 sandhill cranes. A summary of the observations for the east central counties is given in Table 2.

The total number of sandhill cranes breeding in the state for 1977 would then total at least 76 breeding pairs which produced at least 61 young. A total of 201 nonbreeding birds were also present.

The actual number of resident sandhill cranes in Minnesota possibly ranged from 150 to 300 breeding pairs which produced from 150 to 300 young. The number of nonbreeders in 1977 is estimated at 300 to 600, for a total fall population of 600 to 1200 birds.

Table 2. Summary of resident sandhill cranes observed in east central Minnesota in 1977, by county.

East Central Population

<u>County</u>	<u>Breeding Pairs</u>	<u>Young</u>	<u>Nonbreeders</u>
Anoka	2	2	6
Aitkin	2	3	0
Chisago	0	0	0
Kanabec	1	0	0
Mille Lacs	2	2	0
Morrison	5	3	0
Pine	2	1	0
Sherburne	1	1	6
	<hr/>	<hr/>	<hr/>
	15	12	12

Habitat Use

Crane observation cards contained space and instructions for reporting both the cover type and land use for each observation. A numbered and lettered key was provided on the back of the card. Items on the key are as follows:

<u>Cover Type</u>	<u>Land Use</u>
1. Row crop - give crop	A. Natural State
2. Small grain - give crop	B. Recently burned
3. Hayfield/Alfalfa	C. Grazed
4. Upland Prairie	D. Mowed
5. Improved pasture	E. Disked
6. Old field	F. Plowed
7. Fen/wet meadow	G. Harvested
8. Marsh - type 1, 2, 3, 4	H. Other - give details
9. Open lake	
10. River	
11. Other - give details	

For purposes of analysis the reports were separated into four periods -- March through April, May through July, August, and September through October.

March through April

Habitat use by migrating sandhill cranes was reported on 16 occasions. Three sightings of large flocks occurred in Norman County on April 13 and accounted for 1300 of the 1363 birds seen in this period. All other flocks contained 15 birds or fewer. The only use which cranes made of row crops was in corn stubble. Thirty-nine percent of all cranes were seen foraging in corn stubble, 22 percent were in spring wheat, and 37 percent were in wet meadow habitat. The remaining two percent apparently were family groups

Habitat Use by Sandhill Cranes

March - April 1977

<u>Cover Type</u>	<u>Observations</u>	<u>Cranes</u>	
	<u>Number</u>	<u>Number</u>	<u>(Percent)</u>
1. <u>Row Crops</u>			
Corn Stubble	4	531	(39.0)
2. <u>Small Grain</u>			
Spring Wheat	1	300	(22.0)
Plowed ground	2	7	(0.5)
3. <u>Grassland</u>			
Alfalfa hayland	2	8	(0.6)
Old field (Summer Fallow)	1	2	(0.1)
4. <u>Fen/Wet Meadow</u>			
Wet meadow	2	503	(36.9)
5. <u>Marsh</u>			
Marsh - type unspecified	3	11	(0.8)
6. <u>River</u>	1	1	(0.1)
	<hr/>	<hr/>	<hr/>
	16	1363	(100)

returning to resident nesting areas and they were seen on plowed ground, alfalfa hayland, summer fallow, marshes (type unspecified), and along a river. A summary of these sightings is given in Table 3.

May through July

Resident cranes were typically secretive from May through July. Only 51 cards were reported for this three month period and they described the sightings of 243 cranes. Eight sightings of large nonbreeding groups were made in June and July in Beltrami, Marshall and Sherburne Counties. Beltrami County flocks contained 55 and 31 birds, and Marshall County sightings reported 21, 17, and 8 birds. A flock of 6 was seen in Sherburne County on June 9. These groups then accounted for 138 of the 243 birds seen (57%). The remaining 43 sightings involved groups of four or fewer cranes.

Twenty-two percent of all cranes seen were in small grain fields. Most were in unharvested wheat, oats, and flax. A few birds were observed in barley and in harvested wheat.

Seventeen percent of the cranes observed were in various types of grasslands. Unmowed alfalfa and prairie accounted for 17 of 40 grassland sightings. Mowed alfalfa and prairie accounted for four grassland sightings; disked alfalfa and summer fallow totaled six sightings; grazed prairie and pasture totaled eight sightings; and summer fallow and plowed old fields accounted for five sightings.

Only ten percent of all cranes observed were in wet meadows. The actual use by cranes may be greater than this percentage indicates because of the relative inaccessibility of this type of habitat. Three cranes out of 25 seen in this cover type were in recently burned wet meadows.

The greatest number of cranes, 46 percent, was observed in marsh habitat. Where the type was specified, 9 cranes were in type 2 marshes and 6 were in type 3 marshes.

Habitat Use by Sandhill Cranes

May - July 1977

<u>Cover Type</u>	<u>Number of Observations</u>	<u>Cranes Number (Percent)</u>
1. <u>Small Grain</u>		
Wheat - unharvested	2	19
Wheat - harvested	2	4
Barley	1	2
Oats - unharvested	2	5
Flax	2	23
Subtotal	<u>9</u>	<u>53</u> (21.8%)
2. <u>Grassland</u>		
Alfalfa - unmowed	3	9
Alfalfa - disked	1	2
Alfalfa - mowed	1	2
Prairie - unmowed	3	8
Prairie - mowed	1	2
Prairie - grazed	4	6
Pasture - grazed	1	2
Old field - disked	1	4
Old Field - plowed	1	2
Old field -(summer fallow)	1	3
Subtotal	<u>17</u>	<u>40</u> (16.5%)
3. <u>Fen/Wet Meadow</u>		
Wet meadow - natural	6	22
Wet meadow - recently burned	2	3
Subtotal	<u>8</u>	<u>25</u> (10.3%)
4. <u>Marsh</u>		
Marsh - Type 2	4	9
Marsh - Type 3	3	6
Marsh - Type unspecified	6	97
Subtotal	<u>13</u>	<u>112</u> (46%)
5. <u>River</u>		
River	1	2 (0.8%)
6. <u>Other</u>		
Floating sedge marsh - burned	1	4
Bulldozed and cleared land	2	7
Subtotal	<u>3</u>	<u>11</u> (4.5%)
TOTAL	51	243 (100%)

River, floating sedge marsh, and recently bulldozed and cleared land accounted for the other five percent of the cranes observed.

The habitat use by cranes from May through July is summarized in Table 4.
August

Resident crane families became much more conspicuous during August, and 47 cards were turned in for that one month period. It is felt that most of these families were still local residents on or near breeding areas. Four of the 47 sightings were of large non-breeding groups of 50, 34, 23, and 21 cranes in Roseau and Marshall Counties. These sightings accounted for 128 of the 326 cranes seen during this period (39%). Another category of sightings emerged during August -- groups of breeding pairs and young of the year. These groups ranged in size from 6 to 25. Three example flocks seen in Beltrami County, for instance, contained 15 adults and 10 young, 4 adults and 2 young and 6 adults and 4 young. Nine sightings of groups of families totaled 102 birds (31%). Thirty-four sightings, however, consisted of groups of four or fewer birds. Most were single breeding pairs with young of the year and these totaled 96 cranes (30%).

Use of small grain increased considerably in August. Twenty-two percent of the cranes seen from May through July were in small grain fields, but 43 percent of the cranes seen in August were feeding in small grain fields. Most fields were cut and swathed oats (82 percent of small grain use), wheat (8 percent), barley (6 percent), and rye (4 percent).

The percent of cranes observed in grasslands increased slightly from seventeen percent in May through July to 22 percent in August. Most grassland use (66 percent) was in pastures, while 23 percent of grassland sightings were in old fields (summer fallow), and 11 percent were in alfalfa fields.

The number of cranes observed in wet meadows comprised 14 percent of all cranes seen in August. This was a slight increase from the 10 percent recorded from May through July.

Apparently cranes were spending less time in marshlands at this time of year, and more time was spent feeding prior to migration because the percentage of cranes seen in marshes was only 16 percent, compared with 46 percent recorded from May through July. The marsh type was recorded for 20 cranes. Fifteen were seen in type 1 marshes, 4 in type 2 marshes, and one was seen in a type 4 marsh.

Other observations included the sighting of three cranes along rivers and ten on bulldozed sites for a total of 5 percent of all sightings.

A summary of all sightings in August is presented in Table 5.

September through October

Nine sightings have been reported for the fall migration period in September and October and included a total of 2155 cranes. These observations obviously include sightings of resident birds and Canadian migrants. Four large flocks in Roseau County included 1000, 500, 600, and 40 birds. The other five sightings concerned groups of four birds or fewer in Becker, Anoka, and Morrison Counties.

The flocks in Roseau County were observed in swathed wheat and oats and in alfalfa fields. All were in the vicinity of the Roseau River Wildlife Management Area.

Four small groups were seen in marshes, two of which were type 2, and two were unspecified. The other group of four was in a harvested wheat field which was partly disked and partly plowed.

A summary of September through October sightings is given in Table 6.

Table 5

Habitat Use of Sandhill Cranes

August 1977

<u>Cover Type</u>	<u>Number of Observations</u>	<u>Cranes Number (Percent)</u>
1. <u>Small Grain</u> (most cut and swathed)		
Wheat	3	11
Barley	4	9
Oats	9	112
Rye	2	5
Subtotal	<u>18</u>	<u>137</u> (43.4%)
2. <u>Grassland</u>		
Alfalfa field	2	9
Pasture	4	53
Old field (summer fallow)	2	18
Subtotal	<u>8</u>	<u>80</u> (22.2%)
3. <u>Fen/Wet Meadow</u>		
Wet Meadow	7	45 (14.2%)
4. <u>Marsh</u>		
Marsh - Type 1	3	15
Marsh - Type 2	1	4
Marsh - Type 4	1	1
Marsh - Type unspecified	6	31
Subtotal	<u>11</u>	<u>51</u> (16.1%)
5. <u>River</u>		
River	1	3 (0.9%)
6. <u>Other</u>		
Bulldozed sites	2	10 (3.2%)
TOTAL	47	326 (100%)

Table 6

Habitat Use of Sandhill Cranes

September - October 1977

<u>Cover Type</u>	<u>Number of Observations</u>	<u>Number Cranes</u>	
1. <u>Small Grain</u>			
Wheat	2	754	(35%)
Oats	1	750	(35%)
2. <u>Grassland</u>			
Alfalfa Fields	1	600	(28%)
3. <u>Wet Meadow</u>	0	0	(0%)
4. <u>Marsh</u>			
Marsh - Type 2	2	8	
Marsh - Type unspecified	<u>3</u>	<u>43</u>	
Subtotal	5	51	(2%)
TOTAL	9	2,155	(100%)

Habitat Summary

A summary of all habitat use is given in Table 7 and it shows the relative amounts and changes in habitat use by season. While the significance of wet meadows and marshes is probably underemphasized because of inaccessibility and lack of observers in those habitats, this table does identify some of the seasonal habitat preferences shown by this species. As more data accumulates, this data will be important for identifying management needs and opportunities.

Land Ownership

A summary of the land ownership status of Minnesota's sandhill crane habitat is given in Table 8. Based on the number of cranes observed in 1977, 29 percent of the cranes occurred on state-owned land, 11 percent occurred on national wildlife refuges, 13 percent were on Conservation Area and Trust Fund Lands, 5 percent were on The Nature Conservancy Lands, and the remaining 42 percent of habitat was owned by private individuals or county governments.

The recovery of eastern greater sandhill cranes in Minnesota is largely due to the land acquisition programs of the Minnesota Department of Natural Resources, the United States Department of Interior, and The Nature Conservancy. Approximately 45 percent of all cranes observed in 1977 were utilizing these wildlife areas. Another 13 percent of the crane population identified in 1977 was on state-owned Conservation Area and Trust Fund Lands which are proposed as Wildlife Management Areas, but that designation has not yet been finalized. That decision rests with the Commissioner of Natural Resources and will probably be made in the coming year. The remaining cranes, 42 percent, were utilizing habitat on land that was either privately owned or county-owned. Much of this habitat is in jeopardy because of extensive land-clearing, drainage, irrigation projects.

Table 7. Number of Sandhill Cranes Observed by
Habitat Type and Season

	<u>Mar-Apr.</u>	<u>May-July</u>	<u>August</u>	<u>Sept.-Oct.</u>	<u>Total</u>
1. <u>Row Crops</u>					
Corn stubble	531	0	0	0	531
2. <u>Small Grain</u>					
Wheat	300	23	11	754	1088
Oats	0	5	112	750	867
<u>Other</u>	<u>7</u>	<u>25</u>	<u>14</u>	<u>0</u>	<u>46</u>
Subtotal	307	53	137	1504	2001
3. <u>Grassland</u>					
Alfalfa	8	13	9	600	630
Prairie	0	16	0	0	16
Improved pasture	0	2	53	0	55
<u>Summer fallow</u>	<u>2</u>	<u>9</u>	<u>18</u>	<u>0</u>	<u>29</u>
Subtotal	10	40	80	600	730
4. <u>Wet Meadow</u>	503	25	45	0	573
5. <u>Marsh</u>					
Type 1	0	0	15	0	15
Type 2	0	9	4	8	21
Type 3	0	6	0	0	6
Type 4	0	0	1	0	1
<u>Unspecified</u>	<u>11</u>	<u>97</u>	<u>31</u>	<u>43</u>	<u>182</u>
Subtotal	11	112	51	51	225
6. River	1	2	3	0	6
7. <u>Other</u>	<u>0</u>	<u>11</u>	<u>10</u>	<u>0</u>	<u>21</u>
TOTAL	1363	243	326	2155	4087

Table 8. Land Ownership of Sandhill Crane Habitat, Statewide Composite.

	<u>Breeding Pairs</u>	<u>Young</u>	<u>Nonbreeders</u>	<u>Total Cranes</u>	<u>Percent of Total Population</u>
Federal-owned	7	4	29	47	11
State-owned	23	20	72	122	29
Adjacent to State lands	21	20	15	77	18
Trust Fund lands	4	4	0	12	4
Adjacent to Trust Fund lands	1	1	0	3	1
Conservation Area lands	2	1	34	39	9
Adjacent to Cons. Area lands	5	3	0	13	3
TNC Lands	2	3	12	19	5
Other land	12	5	55	84	20
Total	<u>77</u>	<u>61</u>	<u>217</u>	<u>416</u>	<u>100</u>

In the northwest, the most important publicly-owned crane habitats are in the Roseau River Wildlife Management Area, the Red Lake Wildlife Management Area, Beltrami Island State Forest, Eckvold Wildlife Management Area, Agassiz National Wildlife Refuge, and Beaches Lake Wildlife Management Area. A pair of cranes also raised one young in the vicinity of the Pembina Trail Preserve in Polk County, which is owned by The Nature Conservancy.

The most important publicly-owned crane habitats for the east-central population are the Carlos Avery Wildlife Management Area, Mille Lacs Wildlife Management Area, Rice Lake National Wildlife Refuge, Sherburne National Wildlife Refuge, and the Grayling Wildlife Management Area. Other cranes are found in the vicinity of the St. Croix State Forest, Rice-Skunk Wildlife Management Area, and Kunkel Wildlife Management Area. A nesting pair of cranes raised two young on the Crane Meadows preserve in Morrison County. This area is owned by The Nature Conservancy. Several other breeding pair territories are found on private lands in Morrison County and the possibility of preserving these areas should be investigated.

Summary

The encouraging recovery of the eastern greater sandhill crane in Minnesota can be expected to continue in the future as the birds adapt to new habitats, but the loss of existing nesting areas on private lands will probably offset these gains. If any significant increases occur, a management strategy will be necessary to cope with additional crop depredation problems.

Nesting habitat, mainly type 2 and type 3 wetlands, should be acquired where possible to help preserve the crane lands. Wildlife managers are encouraged to use prescribed burning on potential nesting areas to reduce the encroachment of brush, and to identify the management techniques which are most effective in maintaining an adequate amount of crane habitat and in handling crop depredation problems.

The observation card program will be continued in 1978, and further research and field studies will be planned as funding becomes possible.

Appendix 1

Persons who submitted crane observation cards:

United States Fish and Wildlife Service

Larry Hanson, Detroit Lakes
Rollin Siegfried, Detroit Lakes
Rich Joarnt, Detroit Lakes
Daniel Morrison, Detroit Lakes
Wes Thompson, Sherburne NWR
John Wilbrecht, Sherburne NWR
A. W. Niedecker, Sherburne NWR
W. D. Vasse, Agassiz NWR
J. Alderson, Agassiz NWR
Prososki, Agassiz NWR
Roy Ruud, Agassiz NWR
L. Thornbloom, Rice Lake NWR

The Nature Conservancy

John Dorio, St. Cloud
Steven C. Hanson, Morrison County

United States Soil Conservation Service

Alan Gustafson, Crookston

University of Minnesota - Minneapolis

D. F. Parmalee, Minneapolis

University of Minnesota - Crookston

Dan Svedarsky, Crookston

Department of Natural Resources - Section of Wildlife

D. F. Rhode, Carlos Avery WMA
Walt Rohl, Carlos Avery WMA
Velma Rohl, Carlos Avery WMA
Lloyd Knudson, Carlos Avery WMA
Roger Johnson, Carlos Avery WMA
Conrad Christianson, Carlos Avery WMA
Paul Rice, Carlos Avery WMA
Jack Jensen, Roseau River WMA
Loris Danielson, Roseau River WMA
Dave Urich, St. Paul
Larry Nelson, St. Paul
Al Berner, Madelia
Jack Mooty, Grand Rapids
Dave Dickey, Aitkin
Jon Cole, Red Lake WMA
Phil Watt, Red Lake WMA

Section of Wildlife (continued)

Gary Johnson, Little Falls
Dick Tuszynski, Cambridge
Larry Bernhoft, Baudette
Lee Hemness, Hinckley
Rob Naplin, Willmar
Terry Wolfe, Crookston
Robert Farnes, Thief River Falls

Division of Forestry - DNR

Robert Ludwig, Eagle Head
Arnold Ostgarden, Hinckley
Byron Korby, Hinckley
George Saul, Grygla
Marc Thompson, Grygla
Steve Morgan, Greenbush
Jim Steinberg, Williams
Gary Johnson, Wannaska
Grey Kvale, Wannaska
Richard Olson, Wannaska

Section of Ecological Services - DNR

LeRoy Dahlke, St. Paul
Dan Swanson, St. Paul

Division of Enforcement

R. L. Simmon, Roseau
Reid Alter, Sauk Centre

Other Contributors

L. E. Peterson, Stacy, Minn.
Oscar Nehus, Pennington County

DEPARTMENT Natural Resources - Wildlife

Office Memorandum

TO : DNR Field Personnel and other Cooperators

DATE: 6-7-77

FROM : Carrol Henderson

PHONE: 3344

SUBJECT: Greater Sandhill Crane Observation Cards

One of the largest but least understood birds in Minnesota is the greater sandhill crane. A generation ago, it was extremely rare as a nesting species, but in recent years it has appeared to be making a modest comeback in a broad region that extends all the way from Roseau County to Anoka and Pine Counties.

Determination of the current distribution and status of the greater sandhill crane in Minnesota is one of the top priorities of the DNR's new non-game wildlife program. Your participation is critical to the success of this survey.

Please fill out a sandhill crane observation card for each occasion that cranes are seen or heard. Under the remarks section, you should also report the land ownership (federal, state, county, private) and the name of the landowner if nesting birds are involved. Cards should be filled out through each season and submitted to the address on the back of the card May 1, September 1, and December 1 of each year.

Negative information is also important. If you are certain that there are no nesting cranes in some townships or counties of your work area, list them and submit them to the non-game wildlife supervisor.

Sightings or nesting records from previous years should also be reported if they were not reported to the Minnesota Ornithologists' Union previously.

Periodic reports will be prepared concerning this survey and distributed to field personnel. Hopefully, it will help everyone understand how the few moments necessary to fill out these forms are an important contribution toward the continued recovery of this species in Minnesota.

CLH:pmt

1	7	4	2	1	7	4	2	1
R9	R8	MONTH	R5	R4	R3	R2	R1	
SANDHILL CRANE OBSERVATION CARD Minnesota Dept. of Natural Resources								
DATE	_____		TIME	_____				
COUNTY	_____							
SEC.	TWP.	RGE.		_____				
CRANES OBSERVED:								
ADULTS	_____							
JUVENILES	_____							
UNKNOWN	_____							
TOTAL	_____							
COVER TYPE AND LAND USE (SEE BACK)								
OBSERVATION MADE FROM:								
CAR/TRUCK	_____							
AIRCRAFT	_____							
BOAT OR CANOE	_____							
ON FOOT	_____							
OTHER	_____ (Specify)							
REMARKS (Include whether birds were on breeding area or migrating)								
OBSERVER: _____								
HEADQUARTERS: _____								

Cover Types*

1. Row crop — give crop
2. Small grain — give crop
3. Hayfield/Alfalfa
4. Upland prairie
5. Improved pasture
6. Old field
7. Fen/wet meadow
8. Marsh-type 1, 2, 3, or 4
9. Open lake
10. River
11. Other — give details

Land Use

- A. Natural state
- B. Recently burned
- C. Grazed
- D. Mowed
- E. Disked
- F. Plowed
- G. Harvested
- H. Other — give details

*Give dominant plant species and note presence of shrubs, stands of phragmites, or aspen islands.

RETURN COMPLETED FORMS ON MAY 1, AUGUST 1, AND DECEMBER 1 TO THE NON-GAME SUPERVISOR, SECTION OF WILDLIFE, DEPARTMENT OF NATURAL RESOURCES, 390 CENTENNIAL BUILDING, ST. PAUL, MINNESOTA 55155.