

ARROWWOOD WETLAND MANAGEMENT DISTRICT

PINGREE, NORTH DAKOTA

Chase Lake National Wildlife Refuge

Johnson Lake National Wildlife Refuge

Halfway Lake National Wildlife Refuge

ANNUAL NARRATIVE REPORT

Calender year 1989

ARROWWOOD WETLAND MANAGEMENT DISTRICT

Pingree, North Dakota

CHASE LAKE NATIONAL WILDLIFE REFUGE

JOHNSON LAKE NATIONAL WILDLIFE REFUGE

HALFWAY LAKE NATIONAL WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT

Calendar Year 1989

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

ARROWWOOD WETLAND MANAGEMENT DISTRICT
Pingree, North Dakota

ANNUAL NARRATIVE REPORT
Calendar Year 1989

Robert F. [Signature] 6/11/90
Wetland Manager Date

Dale B. Henry 6.15.90
Refuge Supervisor Review Date

Frank Stearns 6/11/90
Complex Manager Review Date

[Signature] 6/11/90
Regional Office Approval Date

TABLE OF CONTENTS

A. HIGHLIGHTS	1
B. CLIMATIC CONDITIONS	1
C. LAND ACQUISITION	
1. Fee Title. . . . .	.2
2. Easements. . . . .	.3
3. Other. . . . .	.3
D. PLANNING	
1. Master Plan. . . . .	.Nothing to Report
2. Management Plan. . . . .	.Nothing to Report
3. Public Participation . . . . .	.Nothing to Report
4. Compliance with Environmental Mandates . . . . .	.4
5. Research and Investigations. . . . .	.5
E. ADMINISTRATION	
1. Personnel. . . . .	.6
2. Funding. . . . .	.7
3. Safety . . . . .	.9
4. Technical Assistance . . . . .	.9
5. Other Items. . . . .	.Nothing to Report
F. HABITAT MANAGEMENT	
1. General.	11
2. Wetlands	11
3. Forests. . . . .	.Nothing to Report
4. Croplands.	13
5. Grasslands	14
6. Other Habitats . . . . .	.Nothing to Report
7. Grazing.	15
8. Haying	16
9. Fire Management.	16
10. Pest Control	16
11. Water Rights . . . . .	.Nothing to Report
12. Wilderness and Special Areas . . . . .	.Nothing to Report
13. WPA Easement Monitoring.	19

G. WILDLIFE

1.	Wildlife Diversity	19
2.	Endangered and/or Threatened Species .	Nothing to Report
3.	Waterfowl.	19
4.	Marsh and Water Birds.	23
5.	Shorebirds, Gulls, Terns, and Allied Species	23
6.	Raptors.	23
7.	Other Migratory Birds.	24
8.	Game Mammals	24
9.	Marine Mammals	Nothing to Report
10.	Other Resident Wildlife.	25
11.	Fishery Resources.	25
12.	Wildlife Propagation and Stocking.	26
13.	Surplus Animal Disposal.	Nothing to Report
14.	Scientific Collections	Nothing to Report
15.	Animal Control	28
16.	Marking and Banding.	28
17.	Disease Prevention and Control	28

H. PUBLIC USE

1.	General	Nothing to Report
2.	Outdoor Classrooms - Students.	Nothing to Report
3.	Outdoor Classrooms - Teachers.	Nothing to Report
4.	Interpretive Foot Trails	Nothing to Report
5.	Interpretive Tour Routes	Nothing to Report
6.	Interpretive Exhibits/Demonstrations	28
7.	Other Interpretive Programs.	Nothing to Report
8.	Hunting.	28
9.	Fishing.	30
10.	Trapping	30
11.	Wildlife Observation	30
12.	Other Wildlife Oriented Recreation .	Nothing to Report
13.	Camping.	Nothing to Report
14.	Picnicking	Nothing to Report
15.	Off-Road Vehicling	30
16.	Other Non-Wildlife Oriented Recreation.	Nothing to Report
17.	Law Enforcement.	30
18.	Youth Programs	Nothing to Report
19.	Cooperating Associations	Nothing to Report
20.	Concessions.	Nothing to Report
21.	Volunteer Program.	Nothing to Report

I. EQUIPMENT AND FACILITIES

1. New Construction . . . . .	.Nothing to Report
2. Rehabilitation . . . . .	.Nothing to Report
3. Major Maintenance. . . . .	.Nothing to Report
4. Equipment Utilization and Replacement.	31
5. Communications . . . . .	.Nothing to Report
6. Computer Systems	32
7. Energy Conservation. . . . .	.Nothing to Report
8. Other. . . . .	.Nothing to Report

J. OTHER ITEMS

1. Cooperative Programs . . . . .	.Nothing to Report
2. Items of Interest.	32
3. Credits.	33

K. FEEDBACK,

INTRODUCTION

The Arrowwood Wetland Management District (WMD) is located in east central North Dakota and includes Stutsman, Foster, Eddy and Wells counties. The WMD consists of 150 Waterfowl Production Areas totalling 36,583 acres and 967 individual wetland easements protecting 70,200 wetland acres. Chase Lake NWR is administered through the WMD as are two easement refuges, Halfway Lake and Johnson Lake.

The District is characterized by the Missouri Coteau on the west and drift prairie to the east. There is very little native prairie left in the district. Most of the grasslands are either tame grasses or seeded natives. With the development of the CRP program, large acreages have been put back into cover with many of these acres planted to a DNC mixture. Unfortunately, the full wildlife potential of these acres has not been realized as a result of extensive haying during the drought years of 1988 and 1989. With the return of good water conditions the wildlife potential of CRP acres is tremendous. In Stutsman County alone, over 125,000 acres have been placed in the CRP Program. Many of these acres are in the coteau where good wetland complexes still exist.

A. HIGHLIGHTS

Chase Lake Prairie Project was initiated with two, full time staff members on board by September. The project dedication, which was held in late September, was a great success with over 200 people attending.

Dry conditions continued in the district. Although we had some spring runoff and spring rains, the summer and fall were extremely dry. One small bright spot in an otherwise dismal moisture picture was a very narrow strip in northern Stutsman County where some landowners reported over 18 inches of rain in August. Unfortunately, this area was less than 10 miles wide.

Primary assistant Jon Kauffeld headed south to finally get his own station, the Rainwater Basin WMD.

The FmHA program began in earnest in the district. Conservation easements were placed on seventeen properties.

Sheep were used for leafy spurge control on one Stutsman County WPA. The results were very promising.

A 62 acre predator exclosure was constructed by Ducks Unlimited on the Thiesen WPA in Stutsman County.

An intensive upland trapping effort was again undertaken near Woodworth in Stutsman County. Nineteen WPAs were trapped. Two control and two trapped units were monitored for nest success. Mayfield nest success rates on the trapped units were significantly higher than those of the control units.

B. CLIMATIC CONDITIONS

Heavy snow in January boosted everyone's spirits, but the remainder of the winter was basically dry. March and April saw timely rains, but most of the summer and fall were very dry. There was no snow cover present at year's end. Returning waterfowl are going to find extremely poor water conditions in the Arrowwood WMD in the spring of 1990.

Weather data is taken from the weather station at Arrowwood NWR Headquarters.

Weather Data for Arrowwood NWR, 1989

	Precipitation(in)		Temperature (°F)		
	1989	Average	Max.	Min.	Average
January	.90	.41	43	-31	14.5
February	.07	.46	55	-25	14.5
March	.95	.68	56	-18	19.9
April	.66	1.52	77	12	40.7
May	3.62	2.37	84	17	57.0
June	1.38	3.44	89	32	62.7
July	3.19	2.76	102	51	73.8
August	6.14	2.52	98	39	69.0
September	2.35	1.88	89	21	58.3
October	.15	1.32	89	14	43.0
November	.36	.59	62	-05	27.2
December	.02	.41	48	-36	12.1
<hr/>					
TOTALS	19.79	18.36	892	71	492.7
AVERAGE	1.65	1.53	74.3	6	41.1

C. LAND ACQUISITION

1. Fee Title

No tracts were acquired in the Arrowwood WMD in 1989.

There are many willing sellers who contact the office on a regular basis. Acquisition worksheets are filled out as time permits, and submitted to the Bismarck Realty Office. We are running into more and more opposition from county commissioners because of short falls in the in lieu of tax payments, our supposed lack of weed control on Service lands, our supposed failure to work with local landowners, taking agricultural land out of production, swampbuster, sodbuster, blackbirds, too much government and on and on and on. The entire process becomes very frustrating at times.

The current status of fee title lands in the Arrowwood WMD:

<u>County</u>	<u>Number of Units</u>	<u>Acres</u>
Eddy	19	4,655
Foster	9	1,482
Stutsman	90	23,104
Wells	<u>32</u>	<u>7,342</u>
Totals	150	36,583

2. Easements

Four easements were taken in the district in 1989. All were in Stutsman County.

The current status of easement lands in the Arrowwood WMD:

<u>County</u>	<u>Number of Easements</u>	<u>Wetland Acres</u>
Eddy	194	11,721
Foster	118	6,654
Stutsman	451	39,331
Wells	203	12,884

Interest in easements is still very high. Easement acquisition worksheets are filled out as time permits and submitted to the Bismarck Realty Office.

Seventeen FmHA conservation easements covering 9,838 acres were acquired in the WMD in 1989. Posting and delineation of wetland and buffer strip boundaries began in the late fall, but was not completed prior to freeze-up.

3. Other

On October 1, 1989, the Pony Gulch WDA, a GDU mitigation tract was turned over to the FWS. This 240 acre unit, purchased in 1984, was one of the original tracts purchased on or adjacent to Garrison Diversion Unit project features for wildlife mitigation. The unit has 15.4 acres of Type 3 and 76 acres of Type 4 wetlands. There are 28 acres of native prairie and 108 acres of DNC.



Restored wetland on the Hawk's Nest GDU tract, which will, hopefully, be turned over to us in 1990 to manage (89-RFJ).

Two GDU mitigation tracts have now been turned over to the Arrowwood WMD. The Pipestone tract, a 160 acre unit, was turned over in October of 1988. Both of these tracts are located in Wells County.

D. PLANNING

4. Compliance with Environmental Mandates

The environmental assessment that had been prepared for the Ducks Unlimited peninsula cutoff on the Haglund WPA was rewritten.

Pesticide Use Proposals and reports were submitted.

In Stutsman County 404 permits were obtained for a wetland restoration project. Level ditches in three small wetlands were filled back to the natural bottom contour.

5. Research and Investigations

A. Arrowwood WMD NR 89 - "A system for assessing status and trends in Waterfowl Breeding Populations and Production on the Fish and Wildlife Service and Surrounding Private Lands in the Prairie Pothole Region." Northern Prairie Wildlife Research Unit #120.A - Lewis Cowardin.

WMD and refuge staff currently count 200 wetlands scattered throughout the four county wetland district on 34 four square mile plots. An additional 14 plots have been established in the Chase Lake core area. Aerial video of these 14 new plots was obtained in 1989, but no counts were made. Pair counts will be made on all 48 plots in 1990.

Data compilation will take place at the Wetland Habitat Office in Bismarck in 1990. Two people are now on board to complete this task. Aerial video and pair counts will be conducted by WMD and refuge staff.

B. Arrowwood WMD NR 89 - "Hydrological Relationship of Groundwater and Surface Water to the Limnology of Prairie Wetlands." Northern Prairie Wildlife Research Unit #904.02 T.C. Winter and G.A. Swanson.

This long term study of 20 wetlands on the Eddy WPA (Stuts. 13) continued in 1989. The impacts of wetland drainage and land use practices on the hydrologic relationship of these wetlands is an important part of this study.

Monitoring of test wells and instrument packages on selected wetlands were primary study activities in 1989. Virtually all study wetlands were dry by mid-summer.

C. Arrowwood WMD NR 89 - "Impacts of Selected Agricultural Chemicals on Waterfowl Inhabiting Prairie Pothole Wetlands." Patuxent Wildlife Research Center Study Plan 888.03.01 - Chris Grue and Mike Tome

Study plans in 1989 called for the application of Fenvalerate on two study plots in Wells County. Water conditions were very poor and the decision was made not to proceed with the planned activities. Small grains, rather than sunflowers, were planted on the two WPA farm units.

Patuxent personnel studied several private sunflower fields in Stutsman County. Wetland insect communities were sampled prior to and after insecticide applications. Results were not available as of this writing.



Warning sign posted on sunflower fields sprayed with methyl parathion (89-RFJ).

E. ADMINISTRATION

1. Personnel

Jon Kauffeld, Primary Assistant, departed for the project leader position at the Rainwater Basin WMD in Nebraska in August. Good Luck Jon!

Gloria Kosse, Refuge Assistant, retired in January.

Mary Liberda, our Secretary, was selected to fill the Refuge Assistant slot and was promoted to GS-6 on April 23.

Mary Beth Ellingson was hired as a clerk/typist in July.

WMD Staff

	<u>PFT</u>	<u>Temporary</u>
FY-89	2.1*	.6
FY-88	2.1	.6
FY-87	2.1	.6
FY-86	2.6	.9
FY-85	2.6	.8

* The WMD staff consists of one permanent full time employee, with the remainder shared within the Arrowwood Complex.

2. Funding

Funding is not broken down by individual substations within the Complex. Totals for the past five years were:

<u>Year</u>	<u>Available Funds</u>
FY-89	\$681,000
FY-88	\$748,601
FY-87	\$611,320
FY-86	\$690,700
FY-85	\$641,700



4. 9. 3. 10. 6. 7. 1. 8.

Personnel

1. F. David Stearns, Project Leader; GM-13 PFT
2. Jon D. Kauffeld, Deputy Project Leader; GS-12 PFT, transferred to Rainwater Basin, 8/89
3. Paul C. Van Ningen, Refuge Manager; GS-9 PFT
4. Robert F. Johnson, Wetland Manager; GS-9 PFT
5. Gloria K. Kosse, Refuge Asst.; GS-7 PFT, retired 1/89
6. Mary K. Liberda, Secretary; GS-5 PFT, promoted Refuge Asst., 4/89
7. Jerald H. Wolsky, Eng. Equip. Oper. Train. Leader; WL-10 PFT
8. James R. Somsen, Maintenance Worker; WG-8 PFT
9. Doris D. Messmer, Biological aid; GS-3 PPT
10. Mary B. Ellingson, Clerk Typist; GS-2 PPT

TEMPORARY STAFF

1. Chad Prosser, Biological Aid, INT NTE 180 days EOD 5/89
2. Myron Butterfield, YCC Work Leader; INT NTE 180 days EOD 6/89
3. Howard Burt, Biological Aid; INT NTE 180 days EOD 4/88-10/88
4. Scott Evans, Trapper, Spec. Needs Appt. EOD 3/89
5. Richard Groz, Bio. Tech.; INT NTE 180 days EOD 5/89
6. Leland Wolsky, Spec. Needs Appt.; Exc. Appt. NTE 9/89

3. Safety

There were no lost time accidents in 1989.

Safety and defensive driving films are shown as they are received. Monthly Safety Meetings were held covering the following topics:

January -	Professional Driving - Film
February -	Winter Survival - Discussion
March -	All buildings were inspected for unsafe conditions. A list of necessary corrective action was proposed.
April -	Before It Hit Home - Film
May -	An Interest in Safety - Film
June -	Rabies Alert - Video
July -	Medical Screening for Lyme Disease
August -	Seconds Can Save Someone You Love - Film
September -	Groundwater and Agricultural Chemicals: Understanding the Issues - Film
October -	Discussed physical fitness and how to keep in shape.
November -	Pleasure of Hearing - Film
December -	Discussed winter driving safety.

4. Technical Assistance

A. National Audubon Society Alkali Lake Sanctuary - Arrowwood staff assisted with placement of flax bales, prescribed burning and restoration of five drained wetlands.

B. Spiritwood Joint Venture Wetland Creation - Arrowwood staff began work on the installation of two dams, which will create a 14 acre wetland in the watershed of Spiritwood Lake. This wetland will provide excellent waterfowl habitat and will also act as a settling basin to remove agricultural chemicals from runoff that enters Spiritwood Lake. The FWS, ND Game and Fish Department and SCS are involved in the project. SCS has provided engineering expertise, ND Game and Fish purchased a water control structure and will pay for its installment and Arrowwood staff will complete the dirt work. Actual dirt moving began in August. Arrowwood staff spent almost two weeks rerouting a Stutsman County Rural Water line that was located at the site of one of the proposed dams. The rains came after the water line had been moved and work on the project was terminated for the year.

A word of caution is appropriate here for anyone getting involved in a multi-agency joint venture project. When this project first started we envisioned it as building a couple of ditch plugs, maybe a weeks worth of work. As it stands now, we will have to move over 37,000 cubic yards of material, install a clay core in the dam, water and pack the fill material and construct an emergency spillway. Instead of a week or so of work we're now looking at a couple of months. We'll have three staff members tied up with this project when there are lots of other tasks that need to be done on the refuge and in the WMD. Although the concept is a good one, if we knew then what we know now we would never have agreed to this project as it now stands.



Arrowwood staff moving Stutsman county rural water line as part of the Spiritwood Joint Venture Project (89-RFJ).

C. Adopt-a-WPA - The Stutsman County Wildlife Federation has "adopted" the Rott WPA (Stuts. 182) in Stutsman County. WMD staff buried all of the rockpiles on the unit, restored a partially drained wetland and created a wetland with the

installation of a coulee dam. We located a cooperator who hayed a DNC stand that was heavily infested with wormwood. Part of the DNC field was broken out and will be farmed as a food plot. The Federation also hopes to renovate a cattail choked wetland on the unit.

F. HABITAT MANAGEMENT

1. General

The goal of habitat management in The Arrowwood WMD is to maintain cover in the best possible condition. Prescribed fire, haying and grazing are the primary tools used for rehabilitation. Breaking out a piece of cover is used only as a last resort.

Interseeding and scarification can produce excellent results in DNC stands. Native grass stands respond well to fire and grazing, and, of course, would never be farmed under any circumstances.

The 150 WPAs in the WMD are made up of approximately 11,500 acres of native grass, 11,800 acres of tame grass and 12,875 wetland acres in 1,650 wetlands. There are also somewhere around 275 acres of woodland.

2. Wetlands

Water conditions were very poor throughout the district in 1989. Many semi-permanent wetlands were dry by mid-summer. Wells County was especially hard hit. Very poor spring runoff and little rain combined to dry up most of the basins in the county. Only the larger lakes held any water by late summer.

We have not been as diligent as we should have in our efforts to maintain wetlands in the best possible condition. Too many basins are cattail choked or have so much accumulated litter that they are far less productive than they could be. Several special use permits were issued for hay this year with the permittee agreeing to mow and dig cattail choked wetlands as payment. We hope to focus more attention on management of wetland basins in the future. Haying, grazing, mowing and cultivation will be used extensively.

Twenty-nine wetland basins were restored in the WMD in 1989. These represented 22 wetland acres. All of the restoration was on private land. One wetland was created on a Stutsman County WPA.



Wells county WPA 2a in October. These conditions were typical of most wetlands in the county (89-PVN).



An easement wetland that was heavily cattail choked after burning, disking, and seeding with a millet crop (89-RFJ).

4. Croplands

Two cooperative farming agreements were issued for food plots in 1989. One Wells County unit yielded absolutely nothing except weeds for the second year in a row and on a 27 acre field in Stutsman county our share amounted to 6 round bales of durum.

Two farming agreements were issued for fields on newly purchased units, one in Stutsman County and one in Wells County that had Treflan carry over from the previous year. The following photo shows what the Wells County unit looked like in early August. The cooperator seeded spring wheat and this was the result of no chemical use and no rain. We now have a very unhappy cooperator.



Non-chemical wheat crop in a very dry year (89-RFJ).

Six farming agreements were issued for seeding all or parts of newly acquired units or fields that were used as part of the Patuxent WRC chemical study.

Two agreements were issued for Patuxent WRC study fields that will remain cultivated pending the return of suitable water levels for a continuation of the chemical study.



A neighbor renamed one of our units in Wells County that was used as a Patuxent study area (89-RFJ).

The 18 acre crop field on the Walsh WPA was seeded force account to winter wheat in August. The lack of new cover may have caused this field to winter kill.

5. Grasslands

In the Arrowwood WMD there are four cover types: native grassland, seeded natives, DNC, and other tame grasses/legumes.

A. Native Grasslands

Grazing and fire are the primary tools we use to manage native grasslands in the WMD. A grazing system was established on 800 acres of primarily native grassland on two Wells County units in 1989. A 400 acre North Dakota Game and Fish Department Game Management Area sits between the two WPAs. At the present time NDG&F is not interested in using cattle as a management tool on this unit. The system will work better on 1200, rather than 800 acres, but we started the system on our two units in 1989. We had some problems with water due to the extremely dry conditions in the area, but we changed the rotation slightly and managed to get the job done. A 160 acre Foster County Unit was

grazed for two periods, May 15 to June 15, and August 15 to September 15, with 19 AUMs used during the first period and 35 used during the second period. A 140 acre field on Eddy 73 was grazed from August through November.

No native grassland stands were burned in 1989.

B. Seeded Natives

No natives were seeded in the district in 1989. We have been trying to plant a 40 acre field in Stutsman County to green needle grass for the past three years. Drought conditions have prevented us from completing the seeding. We will try again in 1990.

A 40 acre seeded native field in Stutsman County was burned in early April. Green needle and western wheat are the primary grass species present and they responded well to the burn.

C. Dense Nesting Cover

Three hundred forty nine acres of DNC were seeded on five units in the district in 1989. It remains to be seen if the seedings were successful. Dry conditions throughout the early part of summer resulted in excellent weed growth, but the grass seed and legumes did not appear to be doing well.

D. Other Grass/Legume cover

A 70 acre field on the Schindler WPA in Wells County was seeded to Spredor alfalfa. We hope to use this field as a seed source. Six hundred and twenty-one acres on 15 units were interseeded with four pounds of alfalfa to the acre after being hayed. The cooperators purchased the seed and drilled it in as payment for the hay.

Rockpiles were buried on two Stutsman County units.

7. Grazing

Four units were grazed in the district this year.

<u>County</u>	<u>Number of Units</u>	<u>Acres Grazed</u>	<u>AUM's</u>
Eddy	1	140	120
Foster	1	160	53.7
Stutsman	0	0	0
Wells	<u>2</u>	<u>320</u>	<u>239</u>
Total	4	620	412.7

The Wells County grazing was part of a long term grazing system developed by Arnie Kruse of the North Dakota Wetland Habitat Office. The system is a double rest deferred rotation.

Vegetative response on the units that were grazed in 1988 was surprisingly good considering the lack of rain.

8. Haying

Thirty-eight special use permits for haying were issued in the WMD in 1989. Nineteen of the permits required interseeding of alfalfa, six were for weed control and the remainder involved manipulation of wetland vegetation, primarily cattails.

<u>County</u>	<u>No. of Permits</u>	<u>No. of Units</u>	<u>Acres Hayed</u>
Eddy	4	3	155
Foster	3	3	62
Stutsman	27	22	833
Wells	<u>4</u>	<u>4</u>	<u>108</u>
Total	38	32	1158

9. Fire Management

Two prescribed burns were conducted in the district in 1989. A forty acre native grass seeding on the Barnes Lake WPA in Stutsman County was burned in April and the 70 acre Eckroth unit in Stutsman County was also burned in April. A 35 acre cattail choked marsh was burned on this unit with the hope that we could flood out the cattails and open up the marsh. Unfortunately, the marsh was dry by early July and the cattails came on as thick as ever.

10. Pest Control

The battles with leafy spurge (Euphorbia esula) continue. This is, by far, the biggest weed problem that we have to deal with. In 1989 we contracted with a local spray service to spray spurge with one quart of 2,4-D amine per acre between May 15 and June 15. We paid fifteen dollars/acre and 255 acres on 48 units in the district were sprayed. We confined our chemical use to spurge plants that were within 100 yards of the boundary of FWS property in an effort to prevent the spread of spurge to neighboring landowners. Spurge plants on the interior of our units were essentially untreated.

We used sheep on one unit in Stutsman County. A 20 acre predator exclosure that has become essentially a solid spurge patch was grazed starting in late May. Thirty-five head were placed in the exclosure on May 25 and another 110 with lambs were placed on June 5. The animals were half Rambouillet, one-quarter Columbia and one-quarter Columbia-Suffolk cross. After one month virtually all of the spurge leaves and flowers had been eaten. The animals were removed and within two weeks new leaves were visible on most stalks and many also had new flowers forming. The animals were placed back on the unit for two weeks in mid-September and most of the new regrowth was removed.



Spurge condition when sheep were placed on the unit (89-RFJ).



Spurge after sheep were present for one month (89-RFJ).



Closeup of individual spurge plants after one month of grazing (89-RFJ).

Several patches of Canada thistle, sow thistle and wormwood were mowed in the district.

The breakdown of leafy spurge sites that were treated follows:

<u>County</u>	<u>Number of Sites</u>	<u>Acres sprayed</u>
Eddy	8	47
Foster	4	25
Stutsman	31	133
Wells	5	50
Total	48	255

13. WPA Easement Monitoring

Four fill, one plow furrow, one scraper ditch and 22 burning violations were found in the Arrowwood WMD in 1989. Forty staff days and \$6550 were spent flying, checking files, ground checking, conducting landowner contacts, writing letters and making compliance checks.

G. WILDLIFE

1. Wildlife Diversity

The diverse habitat base found in the district includes large areas of Missouri Coteau and Drift Prairie. A large diversity of wetlands ranging from small Type 1s to large Type 5 alkali lakes are found throughout the WMD. Wildlife populations are also diverse with both game and non-game species common throughout the WMD.

3. Waterfowl

A. Spring Migration - 1989

On March 23, 1989 one pair of Canada geese and one pair of mallards were seen one mile north of Medina in Stutsman County. A bald eagle and a Canada goose pair were seen on Arrowwood NWR on March 25. Mallards, pintails, shovelers, Canada geese and whitefronts were seen on the refuge on March 26. Meadowlarks, red-tailed hawks, and killdeer were seen in northern Stutsman county on March 26. Small wetlands were open in the WMD on March 28. A major snow goose movement took place in Stutsman county on March 31. The first pelicans were seen at Arrowwood on April 2. The ice went out at Arrowwood on April 19.



Snow geese in the WMD in April (89-RFJ).

B. Breeding pairs and Waterfowl Production

The following tables show breeding pair densities and production for the Arrowwood WMD based on four square mile counts and the Cowardin model. In the Arrowwood district 200 wetlands on 34 scattered four-square-mile plots were counted. Approximately 60 staff days were spent conducting the counts.

C. Fall Migration - 1989

The fall of 1989 was warm and dry. Very little precipitation was received from September through November. Temperatures were very moderate throughout the period. Very few snow geese were in the Arrowwood WMD on September 30, the opening day of goose season. Flocks of small Canada's were scattered throughout the district and giant Canada's were fairly numerous. Duck numbers were low on October 7, the opening day of duck season, with very few wetlands holding water. Scattered areas in the WMD, especially northwestern Stutsman county, had fair numbers of ducks for the entire season. Few duck hunters could be found anywhere in the district, even on opening day. I don't know if the poor water conditions and low duck numbers discouraged a lot

Table 1. Breeding Pairs for Five Dabbling Duck Species at Arrowwood Wetland Management District, North Dakota
1987 - 1989.

SPECIES	OWNERSHIP	1987	PAIRS		1987	PAIR/SQUARE MILE		1989
			1988	1989		1988	1989	
Mallard	Easement	7,573	7,950	7,043	11.52	12.09		10.74
	Federal	867	1,103	1,350	10.01	12.74		15.76
	Private	26,814	26,107	24,926	6.54	6.37		6.03
	TOTAL	35,254	35,160	33,319	7.28	7.26		6.83
Gadwall	Easement	7,490	2,850	6,857	11.39	4.33		10.46
	Federal	1,041	499	1,638	12.02	5.76		19.13
	Private	26,716	9,531	24,732	6.52	2.32		5.98
	TOTAL	35,247	12,880	33,227	7.28	2.66		6.81
B-W Teal	Easement	29,582	16,350	11,111	44.78	24.87		16.94
	Federal	3,014	1,959	1,852	35.25	22.62		21.63
	Private	104,332	53,170	38,922	25.34	12.97		9.41
	TOTAL	136,928	71,479	51,885	28.15	14.76		10.64
Shoveler	Easement	4,065	1,318	2,247	6.18	2.00		3.42
	Federal	511	205	480	5.90	2.37		5.60
	Private	14,442	4,365	8,024	3.52	1.06		1.94
	TOTAL	19,018	5,888	10,752	3.93	1.22		2.20
Pintail	Easement	1,546	1,542	989	2.30	2.35		1.51
	Federal	158	185	165	1.93	2.13		1.93
	Private	5,453	5,016	3,466	1.30	1.22		0.84
	TOTAL	7,157	6,743	4,620	1.45	1.39		0.95

Table 2. Recruits Produced for Five Dabbling Duck Species at Arrowwood Wetland Management District, North Dakota, 1987-1989.

SPECIES	OWNERSHIP	PRODUCTION			YOUNG/SQUARE MILE		
		1987	1988	1989	1987	1988	1989
Mallard	Easement	5,266	3,350	3,832	8.01	5.10	5.84
	Federal	1,522	611	829	17.58	7.05	9.68
	Private	18,492	10,790	15,109	4.51	2.63	3.65
	TOTAL	25,280	14,751	19,770	5.22	3.05	4.05
Gadwall	Easement	10,222	1,977	5,996	15.55	3.01	9.14
	Federal	1,960	314	1,173	22.63	3.63	13.69
	Private	37,532	7,045	25,386	9.15	1.72	6.14
	TOTAL	49,714	9,336	32,555	10.26	1.9	6.67
B-W Teal	Easement	39,328	10,186	8,752	59.82	15.50	13.35
	Federal	5,210	1,110	1,141	60.16	12.82	13.33
	Private	141,159	35,793	37,096	34.43	8.73	8.97
	TOTAL	185,697	47,089	46,989	38.34	9.72	9.63
Shoveler	Easement	4,922	952	2,006	7.49	1.45	3.06
	Federal	908	119	316	10.49	1.38	3.69
	Private	17,341	3,274	8,337	4.23	0.80	2.02
	TOTAL	23,171	4,345	10,659	4.78	0.90	2.19
Pintail	Easement	1,203	560	460	1.83	0.85	0.70
	Federal	141	56	55	1.63	0.64	0.64
	Private	4,227	1,995	1,913	1.03	0.49	0.46
	TOTAL	5,571	2,611	2,428	1.15	0.54	0.50

of duck hunters or there are just fewer duck hunters than there used to be. Most area wetlands had frozen up by mid November. Mallards and Canada geese remained right to the end as they always do.

D. Nest Structures

In the Arrowwood WMD 207 cone type nest structures were checked and five were used. Two of the hatched nests were Canada geese and three were mallard. No nests were destroyed. The 2.4 percent occupancy rate is extremely low. Dry conditions throughout the district contributed to the very low occupancy rate, but we are still far below what we would like.

Forty-two flax bales were placed on three Stutsman county units in March. Five bales were used by nesting geese. All nests were successful.



Unloading flax bales on the Haglund WPA in Stutsman county (89-RFJ).



Raccoons that were wintering in a flax bale stack (89-RFJ).

E. Predator removal

In 1989 a cluster of 19 WPAs in the Woodworth-Medina area of Stutsman county were trapped, beginning in early April and ending in July. A total of 107 red fox, 137 skunks, and 88 raccoons were removed from the 6,532 acres that were trapped for 18,844 trap nights. Other species taken included coyotes, badgers, mink, feral cats, and Franklin's ground squirrels.

Two trapped WPAs and two control (untrapped) WPAs were monitored by Northern Prairie Wildlife Research Center staff. They conducted all nest dragging and monitoring of nest success.

Predator removal was successful in increasing nest success on those areas that were trapped. On the Barnes lake WPA 20 of 45 nests were successful for a Mayfield success rate of 27 percent. The Strand WPA had an 18 percent Mayfield success rate with 31 of 83 nests successful.

Mayfield success on the two control (untrapped) areas, was significantly lower with 2 of 30 nests successful on the Sunday Lake WPA (2 percent Mayfield) and 9 of 39 nests successful on the Cottonwood lake WPA (9 percent Mayfield).

Total costs for the trapping effort were \$6,671.25 (or about one dollar per acre).

4. Marsh and Water Birds

Numerous species use WPAs throughout the WMD. Large, eared grebe colonies have been present on the Cleveland slough and Mud Lake WPAs in Stutsman County, but these colonies were not present in 1989 due to low water levels. White pelicans and double-crested cormorants from the breeding colonies at Chase Lake refuge are seen frequently throughout the WMD. Sora's and American bitterns nest commonly on many of our units. Black-crowned night herons and great blue herons are also very common.

Large numbers of greater and lesser sandhill cranes can be found throughout the western part of the district during spring and fall migration. Northwestern Stutsman and southern Wells counties are used heavily by cranes.

5. Shorebirds, Gulls, Terns and Allied Species

Willetts, marbled godwits, and upland sandpipers nest commonly in the district, primarily in native prairie. Franklin's gulls and black terns have also nested regularly in the past, but low water levels have eliminated many of the traditional nesting colonies. American avocets and killdeer are very common nesting species.

Numerous sandpiper species are seen during spring and fall migration. Wilson's and northern phalaropes are seen during migration and Wilson's nest in the WMD. Common snipe, greater and lesser yellowlegs are common with snipe nesting throughout the district.

Piping plovers are rare in the WMD, but at least one pair nested at Lake Coe in Eddy county. Two downy young were present in early August.

6. Raptors

Red-tailed and Swainson's hawks are the most common nesting hawks in the WMD. Northern harriers and American kestrels also nest in the district with kestrels occasionally utilizing wood duck boxes.

Great-horned owls are extremely common and it seems that every tree belt has a nesting pair. Many great-horned owl pellets are found in nest baskets during winter checks. Sharp-tailed grouse, ring-necked pheasants, gray partridge and cottontail rabbits seem to be very popular food items.

Goshawks, bald eagles, golden eagles, prairie falcons, rough-legged hawks, Cooper's hawks, and sharp-shinned hawks are also seen in the WMD.

7. Other Migratory Birds

Results of the mourning dove call counts are listed below.

Harvey Route	<u>Year</u>	<u>#/Total Calls</u>
	1980	36/173
	1981	No count
	1982	47/191
	1983	67/202
	1984	37/207
	1985	72/456
	1986	44/208
	1987	46/172
	1988	68/441
	1989	57/306
Carrington Route	1980	50/349
	1981	No count
	1982	54/333
	1983	22/160
	1984	27/133
	1985	48/260
	1986	40/257
	1987	52/37
	1988	78/Not recorded
	1989	77/Not recorded

8. Game Mammals

A. Large mammals - White-tailed deer are common throughout the district. No formal population surveys are conducted but winter counts of selected areas are made when snow cover permits.

Deer hunting is the premier fall hunting activity throughout the district. Gun hunters are more numerous than bow hunters although bow hunting is becoming more and more popular. It seems that everyone is a trophy buck hunter and hunters will go to great lengths to get the "big one". Unfortunately, ethics are too often thrown out the window. Driving through CRP fields, early and late shooting, pursuing deer down section line trails, across crop fields, and down main roads with a vehicle also happens far too frequently. It seems that there are very few dedicated hunters left. I find that very unfortunate because the road hunters are killers. They will never know what deer hunting is really all about.

B. Small mammals - Red fox, striped skunk and raccoon are all common throughout the district. These species are also major nest predators with red fox being the worst. Badgers, coyote, and mink are also fairly common in the WMD. Thirteen lined, Richardson's and Franklin's ground squirrels seem to be everywhere in the district with Franklin's also being a major nest predator. Beaver and porcupines are also found throughout the district as are short-tailed and least weasels.

10. Other Resident Wildlife

Hungarian partridge and sharp-tailed grouse are common in the district. Sharp-tailed grouse dancing ground counts are made on selected grounds in the district as time permits with counts being made during the first two weeks in April. No partridge surveys are conducted.

With the large acreage of CRP in the district now seeded, ring-necked pheasants seem to be making a comeback. If we can avoid haying CRP for a couple of years the results may be really outstanding in terms of increased upland bird populations.

Results of the sharp-tailed grouse dancing ground counts follow.

<u>Ground</u>	<u>1987</u>	<u>Number of Grouse</u>	
		<u>1988</u>	<u>1989</u>
Chase Lake	15(flush)	19(flush)	20(flush)
Mud Lake	24(flush)	9(flush)	10(flush)
O'Niell	18(flush)	15(flush)	24(flush)
Mt. Moriah	14 males	18(flush)	16(flush)

11. Fisheries Resources

The only fee title fishery in the WMD is located in Barnes Lake in Stutsman county. In 1989, 52,300 fingerling walleye and 26,150 fingerling northern pike were stocked in Barnes Lake by the North Dakota Game and Fish Department. The walleye fishery in this lake has been excellent for the past three years. Low water levels in the lake have raised concerns about possible winter kill.

12. Wildlife Propagation and Stocking

Valley City WMD staff coordinated the banding and release of captive reared mallards at Lake Louise and Chicago Lake in Stutsman County. Other species were obtained from the egg salvage program in Stutsman county. Under this program farmers who agreed to cooperate were given an incubator and asked to salvage all duck eggs that were found during farming operations. The eggs were picked up once a week and taken to the Dakota Wildlife Trust propagation facility in Valley City.

The captive reared mallards are from wild-strain stock. The eggs were collected from a group of islands in North Dakota. The goal of these releases is to determine whether these hand-reared, wild-strain mallards can survive and return to successfully reproduce at a rate sufficient to rebuild local populations where adequate habitat exists.

The Lake Louise and Chicago Lake release sites are two miles north of Chase Lake refuge in the core area of the Chase Lake Prairie Project. Large areas of CRP, tame grasses and native grasses are located in the area around the release sites.

The number of birds released in 1989 is summarized in the following table.

Birds Banded and Released in 1989

	<u>Male</u>	<u>Female</u>	<u>Total</u>
Mallard	1879	1807	3686
Pintail	6	9	15
Gadwall	101	90	191
Shoveler	9	10	19
Wood Duck	2	3	5
Blue-winged Teal	<u>52</u>	<u>44</u>	<u>96</u>
Totals	2049	1963	4012

* A total of 402 hen mallards were also marked with orange nasal disks.



The release pen at Lake Louise (89-RFJ).



An island created by a peninsula cutoff in Lake Louise. Ducks Unlimited funded the project (89-RFJ).

15. Animal Control

Blackbird depredation complaints are received on a regular basis in late summer and early fall. These are referred to USDA for action.

No deer depredation complaints were received in 1989 in the WMD.

It has been several years since we received any waterfowl depredation complaints. Low water levels, depressed waterfowl populations and poor crops have combined to virtually eliminate the opportunity for any waterfowl depredation.

16. Marking and Banding

All of the ducks released at Lake Louise and Chicago Lake were banded with standard FWS bands.

17. Disease Prevention and Control

The traditional botulism problem areas in the WMD were dry by mid-summer. No botulism problems were encountered.

H. PUBLIC USE

6. Interpretive Exhibits/Demonstrations

The Crystal Springs rest area on I-94 in western Stutsman county receives heavy use and the interpretive exhibit that we have located there receives over 1,000 visits a month during the peak summer tourist season. We hope to enlarge and improve the display next year.

8. Hunting

With the advent of the swampbuster and sodbuster provisions of the 1985 Farm Bill more and more land is being posted as a form of protest. As a result, hunting pressure is increasing on WPAs in the district. Peak use generally occurs on opening weekends, especially the duck and deer gun openers. Non-residents also make extensive use of WPAs for waterfowl and upland game hunting.



A new sign that is being used to post land against hunting (89-RFJ).



A very different point of view from that expressed in the previous photo (89-RFJ).

9. Fishing

Barnes Lake is a popular year-round fishing area. In the past several years fishing pressure has increased dramatically with large numbers of two to four pound walleyes being caught. Northern pike up to 15 pounds are also taken. Some of the locals feel that there are northerns in excess of 20 pounds in the lake.

10. Trapping

Trapping pressure on WPAs has fallen off significantly in the past two years due to the collapse of the fur market. A marked increase in raccoons has been noted while filling nest structures in the winter. As many as ten raccoons have been encountered in an eight acre wetland. It's just about impossible to go into any wetland with cattails and not find at least one raccoon. An increase in fox numbers has also been noted especially in the eastern part of the district.

11. Wildlife Observation

WPAs are not used extensively for wildlife observation. The use that does occur is primarily by non-resident birders that have specific species they are searching for. Since this is a rural area people are used to seeing wildlife on a regular basis and they don't make a special effort to observe animals.

15. Off-Road Vehicling

The unauthorized use of motor vehicles on WPAs is a never ending problem. Snowmobiles, four-wheelers, tractors and pickups are the primary offenders. North Dakota state law allows an individual to drive off trail to retrieve a deer that has been killed and properly tagged. Unfortunately, many deer hunters assume that this law also applies to WPAs. This is a very irritating problem that is difficult to correct. We put out news releases and emphasize that vehicle use is not allowed, but most people either don't bother to read the news releases or don't pay attention to what they read.

17. Law Enforcement

LE patrols are made during the waterfowl and big game seasons. Weekends are worked by at least one officer depending on the level of hunting pressure. All officers work the opening weekends. We coordinate our activities closely with the state wardens and many cases are turned over to them for prosecution.

Citations issued in the WMD during 1989.

<u>Date</u>	<u>Violation</u>	<u>Case Disposition</u>
9/23	Take pheasant during closed season	State
10/7	Hunting waterfowl without duck stamp	\$50.00 bond paid
10/14	Take canvasback during closed season	\$100.00 bond paid
11/22	Hunting big game in closed area.	\$100.00 bond paid

I. EQUIPMENT AND FACILITIES

4. Equipment Utilization and Replacement

The radiator on the cat was replaced and the valves were ground. The overheating problem has been solved.

A Yamaha four-wheeler was purchased. The clutch was replaced in the jeep scrambler.

Central air conditioning units were installed in both residences.

New tires were purchased for the John Deere 40/40 tractor. The haybuster no-till drill was repaired after a cooperator tried to set a land speed record for use of a no-till drill. This is an excellent piece of equipment and we have no complaints about its performance, but you cannot subject it to extreme abuse and expect it to keep functioning properly. The cooperator in question will not be using our equipment in the future.

A concrete floor was poured for our on again - off again oil and paint shed.

6. Computer Systems

A Compaq 286 computer was received on September 27, 1988 and the software was installed in October. Problems arose from the start. The problems were not constant, but consisted of intermittent function failure on command keys. The computer was shipped to the RO in the spring of 1989 for corrective action. There were still numerous problems when the machine was returned. In December of 1989, while at the budget tracking workshop in Bismarck, the computer had major problems. A new A-drive was installed. After many tiring hours on the phone with Vicki Tilden in the RO trying to get our budget program up and running we decided that the computer was still not functioning properly. We shipped it back to the RO in exchange for one of their loaners.

Our computer has been a royal pain. We have spent a great deal of money on repairs not to mention the wasted staff hours. I certainly hope that things get significantly better soon.

J. OTHER ITEMS

2. Items of Interest

Although conditions throughout the WMD remained dry in 1989, the Lake Coe peninsula in Eddy county continued to be a bright spot in our waterfowl management efforts. Ducks Unlimited provided the material to build a 400 foot fence across a ten acre peninsula in Lake Coe in 1986. Nesting populations have continued to build since the fence was constructed. The following table summarizes nesting data at Lake Coe for the past three years.

<u>Species</u>	<u>Number of Nests</u>			<u>Number Hatched</u>		
	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
Mallard	9	9	7	5	6	5
Pintail	0	2	2	0	1	2
Gadwall	22	39	47	19	29	24
Shoveler	2	0	2	1	0	0
B-W teal	7	5	3	4	4	3
L. Scaup	<u>13</u>	<u>35</u>	<u>52</u>	<u>7</u>	<u>23</u>	<u>27</u>
Total	53	90	113	36	63	61

Eight raccoons were captured on the peninsula in 1989. Unfortunately, we didn't get them all as the number of destroyed nests will attest to. Some mink activity was also noted on the peninsula and it appeared that several hens were taken by avian predators.

Two pairs of piping plovers were observed on the peninsula and two downy young were seen in early August. No plover nests were found during nest searches of the peninsula. We did not make any special effort to locate plover nests during our nest searches.

Over 60 Avocet nests were also found during our nest searching activities.

Water levels dropped significantly on Lake Coe in 1989 as they did in 1988. The water level has dropped several feet since 1987, and if significant precipitation is not received, the peninsula will be connected to the mainland at another location during the coming year allowing additional predator access.

Ducks Unlimited funded the construction of a 62 acre predator exclosure on the Thiesen WPA in Stutsman county. This WPA has always had excellent pair populations and high numbers of nests with very low success. The wetland complex is excellent in the area and the potential for significant production from this exclosure is very good.

3. Credits

Bob Johnson wrote the narrative. Mary Beth Ellingson did the word processing and assembling. Dave Stearns assisted with the editing.

K. FEEDBACK

Why do we write narratives? Are they really informative to fellow refuge managers? Do most managers have the time to read them? Each year that I write a narrative I dig out all of the files with all of the reports that we have submitted and copy the information all over again and add a few items about what animals we have seen and what equipment we fixed. The entire process seems like a big waste of time.

In North Dakota we have been submitting very detailed and lengthy monthly activity reports for some time. I suggest that these MARs be put together for each station at the end of the year and shipped to Washington. The same thing should be done with all of the reports that we submit. Put them all together by station, and attach them to the MARs.

If a particular station develops an important management or maintenance technique that information should be provided to the Office of Information Transfer where it would be printed up and sent to every station in the Refuge system. I certainly don't see any benefit to reading about something that is new, innovative, effective or just plain better than the way we're doing things now six years after it happened. Many narratives take at least that long to make the rounds. As I said before, when we do get them a lot of us don't have time to read them.

The whole point of this is what good are narratives? I think we would be much wiser to spend our time restoring wetlands, conducting prescribed burns or doing any other management tasks that have a direct positive influence on the lands that we manage. Writing a narrative doesn't do much for anything.

CHASE LAKE NATIONAL WILDLIFE REFUGE

A. HIGHLIGHTS

Established in 1908 for the protection of white pelicans, Chase Lake is one of the nation's oldest refuges. North America's largest white pelican colony nests on the refuge's two islands. Approximately one-half of the refuge's 4,385 acres consists of Chase Lake. The upland around the lake is both native and tame grassland. Except for 230 acres, in the southwest corner, the refuge is a wilderness area.

B. CLIMATIC CONDITIONS

The lake level in 1989 was substantially lower than in 1988. No records are kept of climatic conditions at Chase Lake Refuge. The nearest weather station is at Pettibone, approximately ten miles northwest of Chase Lake. However, this area, like the rest of central North Dakota, was very dry.

E. ADMINISTRATION

The refuge is unmanned and 34 miles from Arrowwood NWR. Chase Lake Prairie Project staff, located at Woodworth, 17 miles northeast of Chase Lake, will be responsible for management of the refuge beginning in 1990.

F. HABITAT MANAGEMENT

1. General

Except for 230 acres, the refuge is a wilderness area. Prescribed burning is the only habitat management tool used at Chase Lake.

2. Wetlands

Besides Chase Lake there are several other major associated wetlands including one large saline wetland, one impounded wetland, three semi-permanent wetlands, one large fen and several temporary and ephemeral wetlands. Except for the impounded wetland, the large saline wetland and Chase Lake itself, most of the remaining wetlands become dry by mid-summer.

5. Grasslands

In addition to tame grasses and legumes, the refuge uplands consist of native prairie dominated by blue grama and green needlegrass. Prickly pear and ball cactus are common in the native grasslands.

9. Pest Control

The two small patches of leafy spurge that we were aware of on the refuge were sprayed this year. Two other small patches were discovered and will be treated in 1990.

10. Water Rights

The test wells for the Chase Lake Hydrology Study were not sampled in 1989. Hopefully, additional manpower will be available in 1990 to sample these wells.

G. WILDLIFE

1. Wildlife Diversity

In terms of wetlands communities, the Chase Lake NWR comprises, for the most part, an alkali lake typical of glacial outwash deposits in the Prairie Pothole Region. The principal avian species of such lakes are American avocet, piping plover, killdeer, spotted sandpiper, willet, marbled godwit and Wilson's phalarope. The colonial nesters (white pelicans, double crested cormorants, ring-billed and California gulls and common terns) add considerably to the refuge's wildlife diversity.

3. Waterfowl

On June 10, 1989 three Canada goose broods were present on the refuge. Large numbers of shovelers were present on the opening day of duck season. Several thousand Canada and snow geese were using the refuge in late October.

4. Marsh and Water Birds

The annual aerial census of pelican nests was flown in early June. The following table illustrates the number of pelican and cormorant nests on the refuge in the past four years.

	<u># of Pelican</u>		<u># of Cormorant</u>
	<u>Year</u>	<u>Nests</u>	<u>Nests</u>
Small Island	1986	2,087	26
	1987	1,855	0
	1988	3,100	65
	1989	2,313	39

	<u># of Pelican</u>		<u># of Cormorant</u>
	<u>Year</u>	<u>Nests</u>	<u>Nests</u>
Large Island	1986	2,908	131
	1987	5,283	445
	1988	5,540	288
	1989	4,316	249
TOTAL	1986	4,995	157
	1987	7,138	445
	1988	8,640	353
	1989	6,629	288

Chase Lake is a sandhill crane staging area with up to 5,000 birds present on the refuge in late October.

5. Shorebirds, Gulls, Terns, and Allied Species

Several thousand California and ring-billed gulls nest on the islands at Chase Lake. No piping plovers were seen during the June survey.

6. Raptors

Northern harriers are common on the refuge and at least one pair of red-tailed hawks nested on the south end of the refuge.

7. Game Mammals

The refuge is home to approximately 25 deer during the summer. Winter populations can be as high as 700 animals.

8. Other Resident Wildlife

Sharptailed grouse are common on the refuge with several pair of gray partridge also present. Coyotes, an occasional red fox, badgers, mink and raccoons also reside on the refuge.

H. PUBLIC USE

An occasional visitor used the refuge for bird watching and photography. Since Chase Lake is well off the beaten path visitation is very low. Most public use occurs during the deer hunting season. Several hundred hunter visits are made to hunt deer, harvesting between twenty and forty deer.

J.. OTHER ITEMS

2. Items of Interest

The peninsula cutoff fence was operational in 1989. Water levels in the lake dropped and additional cattle panels were added to the ends of the fence. No nest searches were made in 1989. During a piping plover survey on June 10 a Canada goose nest was found on the end of the peninsula and many avocet nests were also found. The goose nest was successful.

Two new signs were placed at the northwest and northeast corners of the refuge.



New refuge signs for Chase Lake NWR (89-RFJ).

I mentioned the Chase Lake Prairie Project earlier in the narrative, and for those of you who are not familiar with it, the following narrative, which was written by Don Hultman when he was the acting Chase Lake project manager gives an excellent summary. Don is now the Project Leader at Benton Lake.

The Chase Lake Prairie Project is an on-the-ground component of the Prairie Pothole Joint Venture and the North American Waterfowl Management Plan. The project objectives are to protect prairie resources, increase duck production 300 percent, increase all wildlife species, and provide public benefits from the above. The overall philosophy of the project is that wildlife and landowners cannot only co-exist, but flourish.

The project is three-tiered, with a Centennial Conservation Area (39 square miles), Core Area (335 square miles) and overall Project Area (8,600 square miles). It is located in the Missouri Coteau, a glacial landform of rolling hills and thousands of wetlands. The Coteau is the most productive waterfowl habitat in the lower 48 states.

Thirty-eight Action Items have been developed that will enhance wildlife on public and private land, provide landowner incentives for sound soil and water management, and provide increased public awareness and recreation opportunities. Actions will be carried out by joint ventures or partnerships that include landowners, wildlife and agricultural agencies, private conservation groups, and private business.

Benefits of the project include a substantial contribution to waterfowl populations currently at near record low numbers; protection of soil, water, and plant resources; a safer, more esthetic environment for man and wildlife; and a better quality of life for farmers, ranchers, and the public at large.

The total cost to achieve plan benefits the first five years is \$22.1 million. These costs will be shared by those Federal, State, private organizations, and individual partners dedicated to the objectives of this plan.

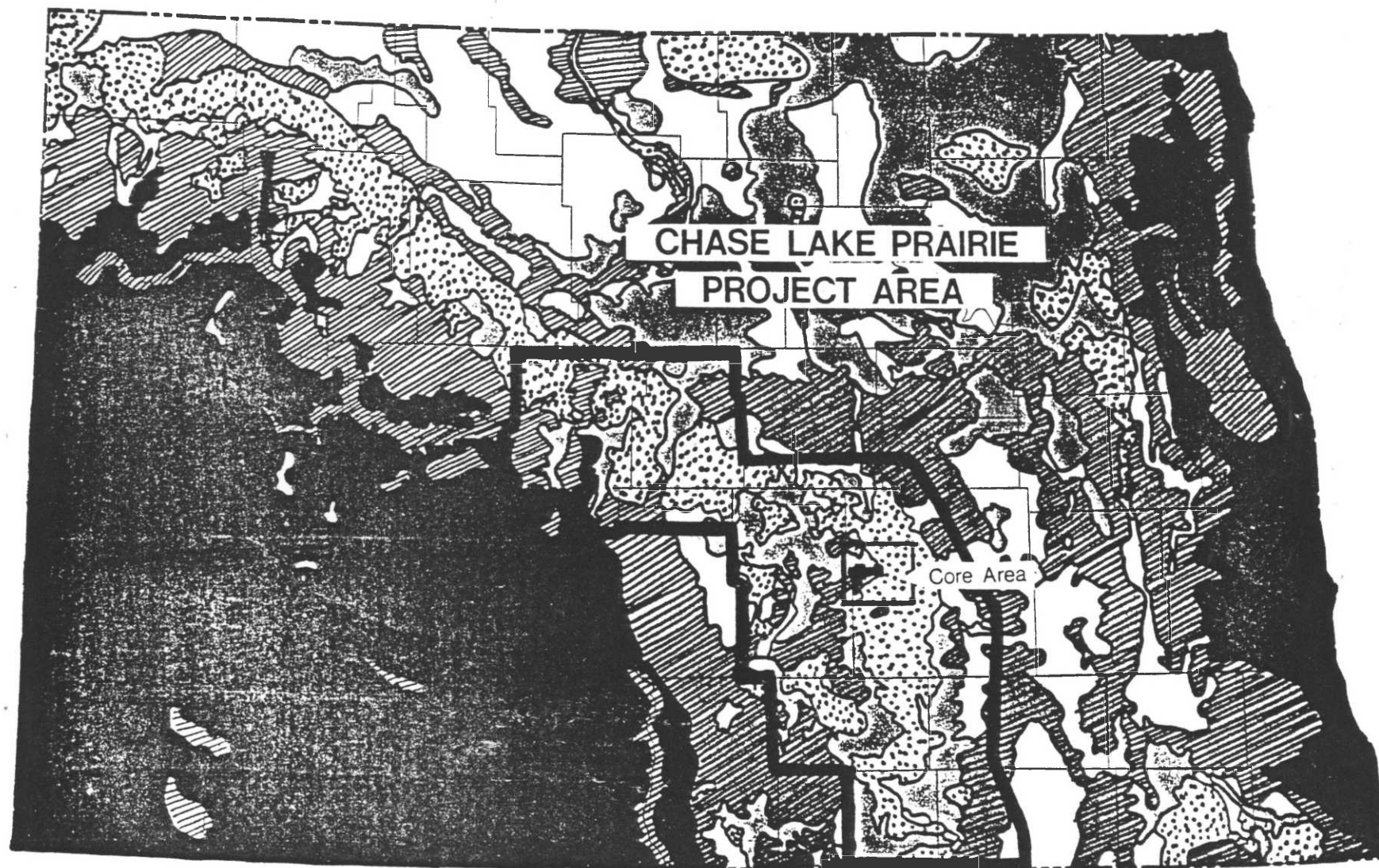
The Chase Lake Prairie Project now has a full time staff of two with a part time clerk/secretary. Management of Chase Lake Refuge and WPAs in the core area have been turned over to them. The CLPP office is at the Woodworth Station, a substation of the Northern Prairie Wildlife Research Center.

Logistical support, funding, and administrative support as well as equipment are provided by the Arrowwood Complex. We all hope that this project is a huge success and that we prove that farmers and wildlife can co-exist and flourish. Two PFT slots from other parts of the complex were used to staff this new substation.

The following maps present the total project area for the Chase Lake Prairie Project.

3. Credits

Bob Johnson wrote the narrative. Mary Beth Ellingson did the word processing and assembling. Dave Stearns assisted with the editing.



Map prepared by Harold A. Kantrud and Robert E. Stewart during the mid-1960s, and based upon early 1950's aerial photography. Much of the excellent and good waterfowl breeding habitat depicted for eastern North Dakota has been destroyed.

BREEDING WATERFOWL HABITAT IN NORTH DAKOTA

RELATIVE QUALITY OF HABITAT

EXCELLENT

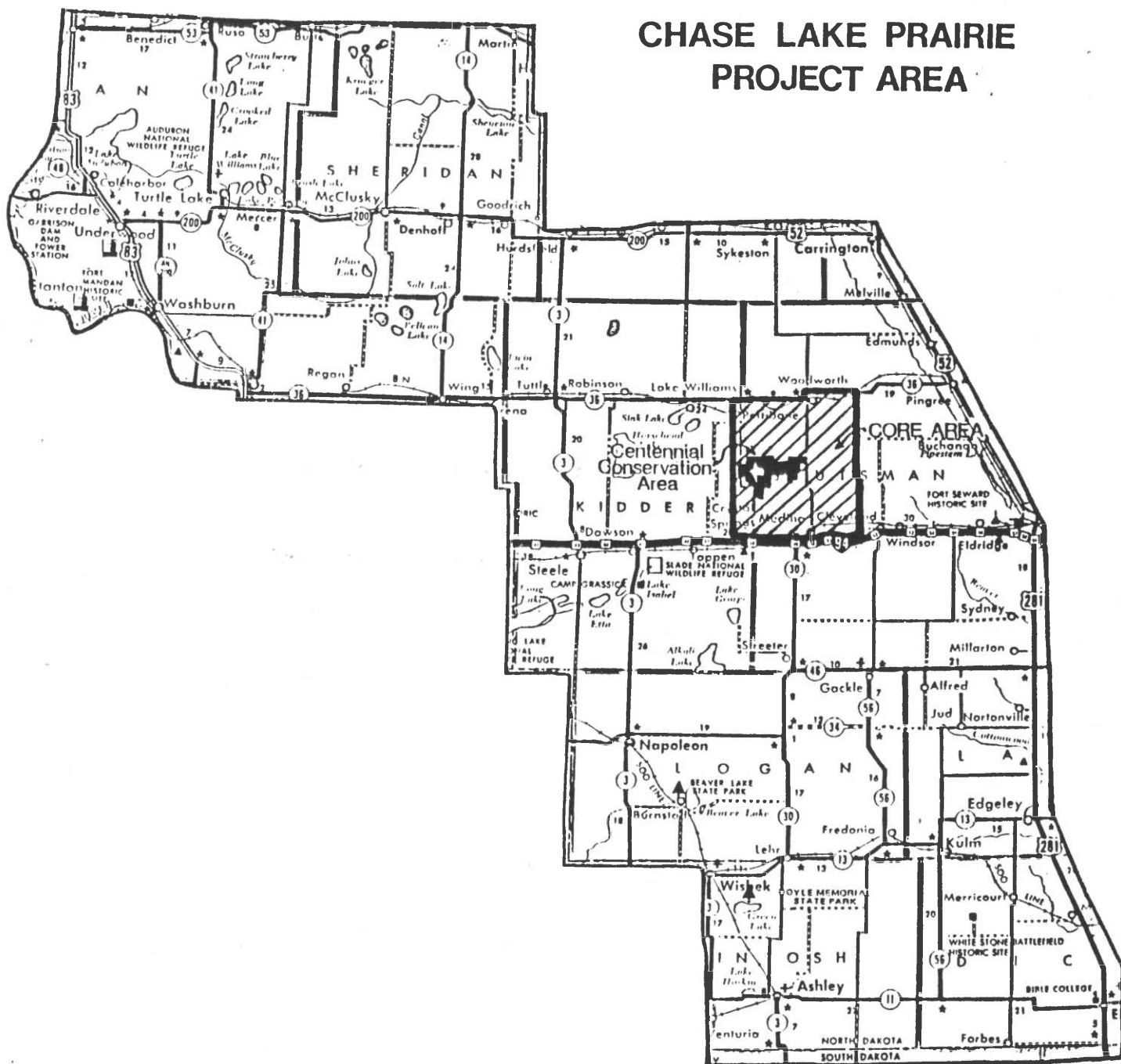
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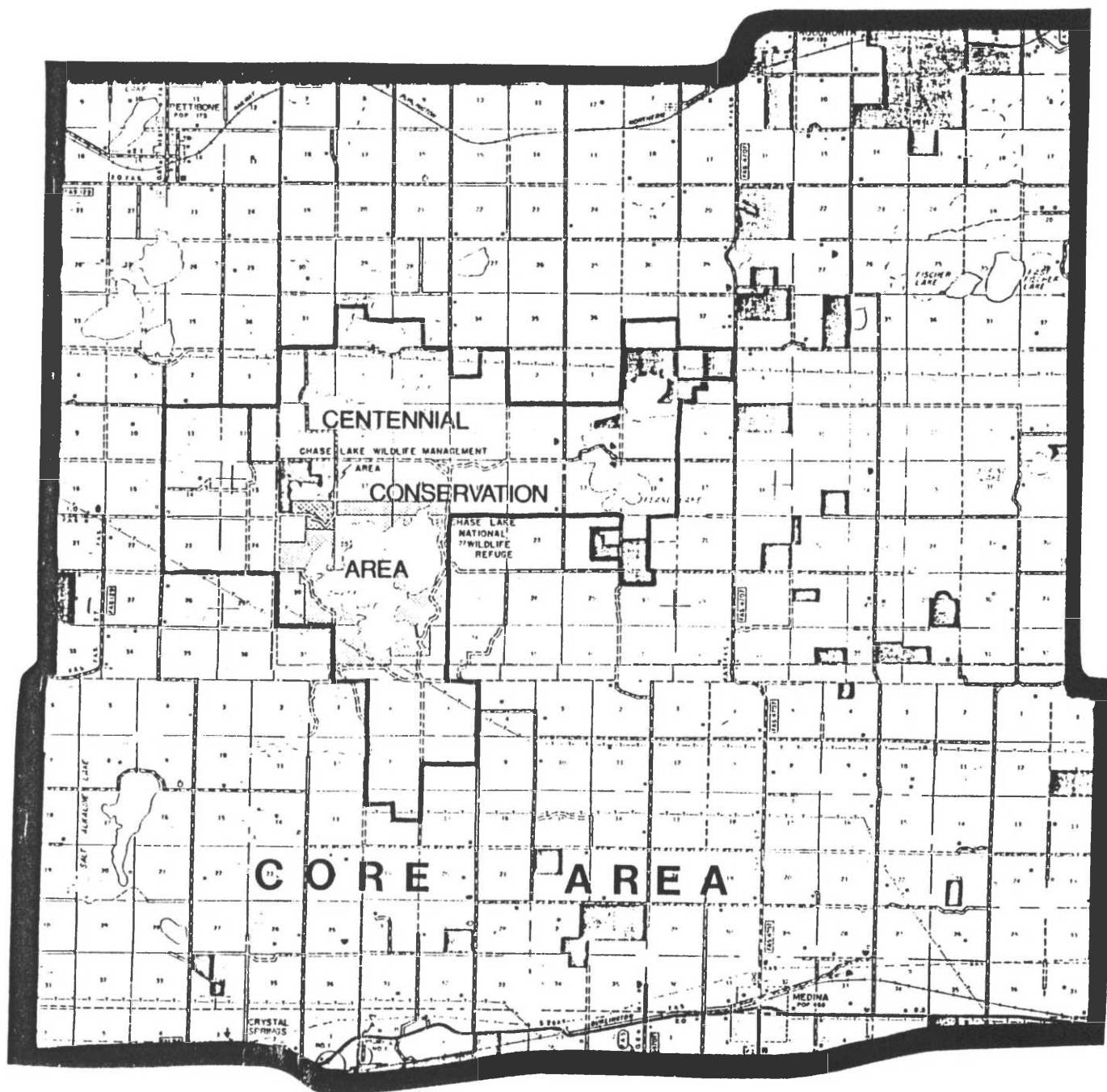
GOOD

POOR

MODERATE

CHASE LAKE PRAIRIE PROJECT AREA





JOHNSON LAKE NATIONAL WILDLIFE REFUGE

Johnson Lake National Wildlife Refuge is a 207 acre easement refuge located 29 miles east of New Rockford in Nelson and Eddy counties of North Dakota. The Fish and Wildlife Service owns 4.5 acres and has perpetual flowage and refuge rights. These include restrictions on access, trapping, and hunting. An 800 acre Type 5 wetland is found on the area.

In 1971, management of the Nelson county portion of Johnson Lake was transferred from the Devils Lake WMD to the Arrowwood WMD. No special management problems have been encountered. The boundaries are checked once a year.

Snow geese, Canada geese, and tundra swans use the refuge during migration. Giant Canada geese also nest on the refuge.

Large numbers of white-tailed deer use the refuge during the winter.

The refuge is checked by WMD staff during the waterfowl and deer seasons, but visits during other times of the year are rare.

HALFWAY LAKE NATIONAL WILDLIFE REFUGE

Halfway Lake National Wildlife Refuge is a 160 acre easement refuge located four miles south of Medina in Stutsman County, North Dakota. The Fish and Wildlife Service does not own any land or make any improvements on the refuge, but has an easement granting perpetual refuge rights. These rights include restrictions on access, hunting, and trapping. A Type 4 wetland of approximately 100 acres is located on the refuge and is used extensively by migrating waterfowl in the spring and fall. The remainder of the refuge is native prairie.

No major problems have been encountered with the management of Halfway Lake. The boundary signs are checked once a year just prior to the waterfowl season.

No waterfowl surveys were conducted in 1989.