ARROWWOOD WETLAND MANAGEMENT DISTRICT

PINGREE, NORTH DAKOTA

ANNUAL NARRATIVE REPORT
CALENDAR YEAR 1990

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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

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Paulette Scherr — Refuge Manager — 2-3-92 — Date

Dale B. Henry — Refuge Supervisor Review — 2-17-92 — Date

Regional Office Approval — 2/20/92 — Date

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, 967 individual wetland easements protecting 70,200 wetland acres, 4 Garrison Diversion Unit Wildlife Management Areas totalling 3,040 acres, and 21 FmHA conservation Easements covering 12,710 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 1990. 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.

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A. HIGHLIGHTS

Complex Manager Dave Stearns departed for Alaska in June and his replacement, Darold Walls, arrived at Arrowwood from Tamarac NWR in October.

Local farmers harvested some of the best crops ever grown in this area. Barley yields of over 100 bushels/acre and durum wheat yields of over 80 bushels/acre were recorded in Wells County. A Stutsman County cooperator reported a wheat yield of 56 bushels/acre on a Stutsman County WPA. These yields were the result of very timely rains during the growing season.

Winter precipitation and spring runoff were virtually non-existent. Late summer and fall rains were also lacking. The timely rains during the growing season did little to recharge wetlands. Once again we have entered the winter with little topsoil and subsoil moisture. The habitat picture for waterfowl in the WMD is extremely bleak.

Assistant Wetland Manager Luna EOD on a full time basis on May 1. Carmen came to Arrowwood from the Northern Prairie Wildlife Research Center.

Goats and sheep were used for leafy spurge control on two Stutsman County units.

Private land activities continued with the hiring of an extension bio-tech who works exclusively on private lands.

The predator symposium was held in Jamestown in August and was a great success.

B. CLIMATIC CONDITIONS

The winter of 1989-1990 was extremely dry. Total precipitation for the December/February period was .20 inches with normal precipitation for the same period 1.28 inches. The total snowfall for the winter period was approximately 12 inches with almost all falling in March. Heavy rains were received in June, but did little to fill wetlands already suffering from two years of drought.

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

Weather data for Arrowwood NWR, 1990.

	Precipitation (in.)		Temperature (°F)		
	1990	Average	Max.	Min.	Average
January	.06	.41	56	-27	23.6
February	.12	.46	54	-21	.1
March	1.58	.68	65	- 1	32.9
April	1.29	1.52	91	11	43.3
May	.53	2.37	81	21	53.4
June	7.33	3.44	90	34	65.3
July	2.01	2.76	92	46	68.2
August	1.75	2.52	96	41	68.3
September	2.09	1.88	93	31	60.4
October	.32	1.32	85	12	45.8
November	.03	.59	67	- 4	31.1
December	.45	.41	53	-36	14.3
TOTALS	17.56	18.36	923	107	527.7
AVERAGE	1.46	1.53	76.9	8.9	43.9

C. LAND ACQUISITION

1. Fee Title

No tracts were acquired in the Arrowwood WMD in 1990.

Willing sellers continue to contact us. In 1990, two acquisition proposals were submitted for tracts in Foster County. We have a number of interested landowners in Stutsman County but due to the pending Chase Lake acquisition we have put these on hold.

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

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

2. Easements

Four easements were taken in the WMD in 1990. All were in Stutsman County.
Eleven easement proposals were submitted in 1990, nine in Stutsman County and two in Foster County. Several other tracts were

inspected, but were judged not to be suitable and no acquisition worksheets were submitted.

The current status of easement lands in the Arrowwood WMD:

County	Number of Easements	Wetland Acres
Eddy	194	11,721
Foster	118	6,654
Stutsman	455	39,462
Wells	203	12,884
TOTALS	970	70,721

Twenty-one FmHA conservation easements covering 12,709 acres have been acquired in the WMD. Five of these properties have been sold and, hopefully, with manpower permitting, we will complete marking on these tracts in 1991.

3. Other

Four Wildlife Development Areas (WDAs), Garrison Diversion Unit (GDU) mitigation tracts, in the Arrowwood WMD have been turned over to the FWS for management.

Unit Name	County	Wetland Acres	Upland Acres	Total Acres
Pipestone	Wells	43.9	113.6	157.5
Pony Gulch	Wells	91.4	148.6	240.0
Indian Hills	Wells	346.7	1336.6	1706.4
Hawks Nest	Stutsman	197.7	737.7	935.4
TOTALS		679.7	2336.5	3039.3

There are 23.1 acres on the Indian Hills Tract that are classified as woodlands or other (gravel pits, trails, etc.). These units have large areas of restored wetlands and were purchased as part of the GDU mitigation package.

Restored/Created Wetland Acreage on Garrison WDAs

Unit	Type I	Type III	Type IV	TOTAL
Pipestone	.6	2.4	40.6	43.6
Pony Gulch	0	0	0	0
Indian Hills	5.9	117.7	0	123.6
Hawks Nest	3.8	37.4	45.0	86.2
TOTAL	10.3	157.5	85.6	253.4

The Pony Gulch unit was purchased in 1974 and is one of the original tracts purchased in or adjacent to GDU project features for wildlife mitigation. This tract did not contain any restorable wetlands because it was acquired under the earliest version of the wildlife plan.

D. PLANNING

4. Compliance with Environmental Mandates

Pesticide use proposals and reports were submitted.

In Stutsman County, 404 permits were obtained for three island construction projects on private lands. Authorization was also obtained from the SHPO and the State Health Department for these projects.

5. Research and Investigations

A. Arrowwood WMD NR 90 - "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 Center (NPWRC) 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. Aerial video is obtained for all plots in late April/early May. A representative sample of wetland types on private easement and federal lands are counted and through the magic of computers, a production figure for the WMD is generated.

Data compilation takes place at the Wetland Habitat Office (WHO) in Bismarck. NPWRC staff continue to make refinements in the model that is used with this system.

B. Arrowwood WMD NR 90 - "The Hydrological Relationship of Groundwater and Surface Water to the Limnology of Prairie Wetlands." NPWRC 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 1990. An important aspect of this study are the impacts of wetland drainage and land use practices on the hydrologic relationship of these wetlands.

Monitoring of test wells and instrument packages on selected wetlands were primary study activities in 1990. Most study wetlands were dry by mid-summer. George Swanson presented a paper on this unit in August at the Predator Symposium in Jamestown, ND. The presentation summarized the study activities on the unit and was presented as part of a field trip in the WMD that highlighted management practices and problems.

A primary production study was started on this unit in 1990 by personnel from the North Dakota State University. NDSU personnel are also conducting a soil study dealing with the chemistry of transition zones on the unit. Two tours were given on the site. One tour was given to the North-Central Chapter of Wetland Scientists and another tour was given to attendees of the Predator Symposium.

Two posters and three oral presentations dealing with this study were given at the Aquatic Ecosystems In Semi-Arid Regions and Implications For Resource Management Seminar in Saskatoon, Saskatchewan.

EPA has identified this unit as a long-term wetland study site and the area has also received international attention.

C. Arrowwood WMD NR 90 - "Impacts of Selected Agricultural Chemicals on Waterfowl Inhabiting Prairie Pothole Wetlands." Patuxent Wildlife Research Center Study Plan 888.03.01- Mike Tome.

Two study areas are located in Wells County but due to the extremely dry conditions for the past three years no planned activities were conducted in 1990. The segment of the study that has not been completed due to dry conditions involves the application of Fenvalerate on sunflowers and its effect on adult and immature waterfowl and invertebrates in prairie wetlands.

Hopefully, when (or perhaps I should say if) water returns to North Dakota, this study will continue and important data dealing with the toxic effects of insecticides on waterfowl and wetland invertebrates will be obtained.

D. Arrowwood WMD NR 90 - "Differential Effects of Coyotes Versus Red Foxes on Duck Nest Success in Managed Uplands." NPWRC unit 1280 - Marsha Sovada and Alan Sargent.

This year was the first year of field work for this study. Six Stutsman County WPAs and parts of Arrowwood NWR were used as study sites. The study is based on the promise that nest success is greater in areas occupied by coyotes than in areas occupied by red foxes. The presence of coyotes tends to suppress red fox occupancy of that area.

Preliminary results for 1990 were rather interesting. The results are as follows:

Thiesen WPA	- 22 nests	- 12% Mayfield Success	- Fox Area
Barnes Lake WPA	- 12 nests	- 26% Mayfield Success	- Fox Area
Sunday Lake WPA	- 5 nests	- 27% Mayfield Success	- Fox Area
Dammel WPA	- 19 nests	- 29% Mayfield Success	- Fox Area
Bingham WPA	- 24 nests	- 6% Mayfield Success	- Coyote Area
Mud Lake WPA	- 12 nests	- 43% Mayfield Success	- Coyote Area

There was indication of some fox activity on the Bingham area and there was evidence of a coyote near the Thiesen WPA.

E. ADMINISTRATION

1. Personnel

Dave Stearns, Complex Manager, returned to Alaska in June.

Darold Walls, an old North Dakota veteran, arrived from Tamarac Refuge in Minnesota in October to take over the Complex Manager position.

Mary Liberda, Refuge Assistant, was promoted to GS-7 on 6-3-90.

Mary Beth Ellingson, Clerk/Typist, was promoted to GS-3 on 12-16-90.

Carmen Luna, ROS, joined the WMD staff on a full time basis in May. She had been on the Arrowwood payroll since January, but most of her time was spent completing a botany course at Jamestown College and wrapping up her activities at NPWRC.

WMD Staff

	PFT	Temporary
FY 90	3.1*	1.0 (private lands)
FY 89	2.1	.6
FY 88	2.1	.6
FY 87	2.1	.6
FY 86	2.6	.9

* The WMD staff consists of two PFT employees 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:

Year	Available Funds
FY-90	$ 783,300
FY-89	681,000
FY-88	748,601
FY-87	611,320
FY-86	690,700

Personnel

3 2 5 *1 6
7 8 4 (CRL)

1. Darold T. Walls, Project Leader, GM-13 PFT, EOD 10/90
   *F. David Stearns, transferred to Alaska 6/90.
2. Paul C. Van Ningen, Supervisory ROS, GS-9 PFT
3. Robert F. Johnson, Supervisory ROS, GS-9 PFT
4. Mary K. Liberda, Refuge Assistant, GS-7 PFT,
5. Jerald H. Wolsky, Eng. Equip. Oper. Training Leader, WL-10 PFT
6. James R. Somsen, Maintenance Worker, WG-8 PFT
7. Doris D. Messmer, Biological Aid, GS-3 PPT
8. Mary Beth Ellingson, Clerk/Typist, GS-3 PFT
9. Carmen Luna, ROS, GS-7, EOD 5/90.

Temporary Staff

2 3 4 1
1990 Youth Conservation Corps Staff (PVN).

1. Collin Stangeland, YCC Work Leader, INT NTE 180 days, EOD 6/90.
2. Andy Neys, YCC Enrolee
3. Billie Jo Nihill, YCC Enrolee
4. Mike Hendricks, YCC Enrolee
5. Rick Bohn, Biological Technician (extension), GS-5, INT NTE 1 year, EOD 2/90.

3. Safety

There were no lost time accidents in 1990.

Defensive driving and safety films are shown as they are received. Monthly safety meetings were held covering the following topics:

January	-	Ground Water and Ag Chemicals: Understanding the Issues - Video.
February	-	No Meeting
March	-	Acid Rain - Film
April	-	No Meeting
May	-	No Meeting
June	-	Appliance Quiz - Video

July - Children in Crashes - Film
August - Circle of Safety - Film
September - Silent Society - Film
October - Teaching Children Poison Prevention - Video
November - Quest For Highway Safety - Video
December - No Meeting

4. Technical Assistance

A. National Audubon Society Alkali Lake Sanctuary

Arrowwood staff delivered and helped place flax bales on Alkali Lake. We also provided several large feed bales that were used as winter food for deer and pheasants.

(CRL)

Wolsky and Somsen spent two weeks on the sanctuary constructing a dam to create a four acre wetland.

(CRL)

The engineering work for the dam was completed by Ducks Unlimited, FWS supplied a cat, motorized scraper and labor and the Audubon Society provided the fuel.

F. HABITAT MANAGEMENT

1. General

All of our habitat management efforts are directed at maintaining cover in the best possible condition. Prescribed fire, grazing and haying are the tools that we use for habitat manipulation. Many old DNC fields are becoming weed infested. The legumes have virtually disappeared from these stands and they are nowhere near as vigorous as they once were. These stands need to be broken out, farmed and reseeded to establish vigorous grass stands. This is an excellent time to rejuvenate our lands because of the large areas of private lands that have been seeded to CRP in the WMD.

The 150 WPAs in the WMD are made up of approximately 11,500 acres

of native grass, 11,800 acres of tamegrass and 12,875 wetland acres in 1,650 wetlands. There are also somewhere around 275 acres of woodland.

2. Wetlands

The virtual lack of runoff in the spring of 1990 left most wetlands entering the waterfowl breeding season in poor condition. Heavy rains in June did little to recharge or maintain basins. Most wetlands, including many semi-permanents were dry by late summer. Many of the larger lakes in the WMD had very low water levels with large areas of mudflats showing up throughout the summer and into the fall.

Jim somsen restoring a wetland on the Faul WPA (RFJ).

Sixteen wetlands were restored in 1990 on two WPAs. Seven wetlands on the Faul tract in Wells County and nine wetlands on the Koenig Tract in Stutsman County were plugged in August by Jim Somsen. Both of these units are newly acquired WPAs.

We attempted to disc cattails on four Stutsman County units in the fall of 1990. In spite of what appeared to be very dry conditions, our tractor became stuck on each unit and we had to terminate our cattail control efforts for the year.

(RFJ)

4. Croplands

A total of 1,096 acres were under cultivation in 1990 in the Arrowwood WMD. Of this total, 254 acres were summer fallowed on one Wells County unit. These acres were a failed 1988 DNC seeding and were broken out in April of 1990.

Seventy-five acres were farmed on the Ackerson WPA as part of a leafy spurge control program. The durum that was planted on this unit in 1990 yielded 56 bushels/acre. The governments share was 60 large bales of unharvested grain.

These durum bales were used as winter feed throughout the WMD and were some of the best bales we have ever had (RFJ).

Seventy acres on the Thiesen WPA and 27 acres on the Geier WPA in Stutsman County were farmed as food plots. Our share was left as standing corn on Thiesen and as large round bales on Geier. Forty acres were seeded to DNC on the Koenig Tract in Stutsman County with the cooperator harvesting 100 percent of the nurse crop.

Sudan grass planting (RFJ).

A cooperator seeded sudan grass on a 40 acre tract on the Wagner WPA in Stutsman County and was left unharvested for weed control. There was an excellent stand of sudan grass and this field will be seeded to native grass with a no-till drill after being burned in the spring of 1991.

Four WPAs were farmed in Wells County. We had planned on seeding approximately 160 acres to grass on one of the units but due to the extremely dry spring we decided against it. One hundred and eighty acres were farmed on the Faul WPA, with our share taken in combined grain and 250 acres were farmed on the Steinhurst WPA with our share taken in feed bales. Both of these units were purchased as part of the Crystal Lake drain agreement.

Eighty acres on the Pohlman WPA and 65 acres on the Bibow WPA are part of the Patuxent WRC chemical study. These fields were seeded to forage crops in 1990 to eliminate chemical use and the producers received the entire crop. An additional 80 acres on the Bibow WPA is in a non-chemical crop rotation as a food plot.

The 18 acre field on the Walsh WPA in Stutsman County that is farmed force account was in summer fallow in 1990. This field was worked four times in an effort to eliminate the extremely heavy quack grass infestation.

5. Grasslands

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

A. Native Grasslands

Grazing and fire are the primary tools that are used to manage native prairie. The grazing system that was established on the Whipple WPA in Wells County has been continued. The cooperators put in a dugout that will be used as a water source for two paddocks. The drought conditions of the past three years have created serious problems with the availability of water on this unit. In spite of the drought conditions the grassland response appears to be excellent.

The Topp WPA in Foster County, a 160 acre unit, was grazed for two periods, July 15-August 15 and September 15-October 15. Thirty-four AUMs were used during each period.

A 40 acre segment of the Dammel WPA in Stutsman County was grazed in September in an effort to remove litter accumulation. The Schroeder WPA in Stutsman County was also grazed. This 55 acre unit has 12 acres of grassland.

A number of units were suitable for grazing in 1990, but because of the lack of water these units were not grazed. Unfortunately, it appears that water conditions may be even worse in 1991.

A total of approximately 150 acres of native grasses were burned on two Stutsman County units in 1990.

Seventy acres of native grassland were hayed on the Gasal WPA in Stutsman County. This unit was initially scheduled to be grazed, but the lack of water prompted the use of haying as a management tool.

B. Seeded Natives

One hundred and seventy acres of seeded natives on three Stutsman County units were burned in the WMD in 1990. Vegetative response was excellent and on the Haglund WPA the response was absolutely fantastic. A sixty acre field was seeded directly into stubble with a cool/warm season native mix on this unit during the fall of 1983. The stand was plagued with weed problems and it never appeared that there was a very good "catch". The following photo of this field, taken three months after it was burned speaks for itself.

A beautiful stand of seeded big blue stem (RFJ).

C. Dense Nesting Cover

A forty acre field on the Koenig WPA in Stutsman County was seeded to DNC in 1990. The fields that were seeded in 1989 showed mixed results. Two units have good stands while three are questionable. The dry conditions that existed throughout the late summer of 1989 appears to have had a significant impact on stand establishment.

D. Other Grass/Legume Cover

The 70 acre field on the Schindler WPA that was seeded to Spredor alfalfa in 1989 had a very spotty catch. There are patches of weeds throughout the field. We will find out if spredor is, in fact, a rhizomatous alfalfa and if it will spread like it's supposed to.

7. Grazing

Four units were grazed in the district this year:

County	Number of Units	Area Grazed	AUM's
Eddy	0	0	0
Foster	1	160	67.6
Stutsman	2	58	
Wells	1	320	310.5
TOTAL	4	538	378.1

8. Haying

Thirty-eight special use permits for haying were issued in the WMD in 1990. The breakdown is as follows:

County	# of Permits	Acres Hayed	Reason Hayed
Eddy	2	41	Grassland Management
	0	0	Weed Control
Foster	0	0	Grassland Management
	0	0	Weed Control
Stutsman	19	537	Grassland Management
	13	535	Weed Control
Wells	0	0	Grassland Management
	4	155	Weed Control
TOTAL	38	1268	

Small weed patches on several units were mowed force account.

9. Fire Management

Five prescribed burns were conducted in the WMD in 1990. A total of 548.9 acres were burned. The largest burn was 280 acres on the Stirton WPA in Stutsman County. A 33 acre, cattail choked, Type IV marsh on the Joos WPA in Stutsman County was burned in May. One of the neighbors had asked if we would burn the marsh, he would disc the cattails. It must have slipped his mind because the cattails were never disced, the marsh stayed dry and now the cattails are thicker than ever.

10. Pest Control

The battle to control/manage leafy spurge in the WMD continues. The problem continues to grow, both on the ground and politically. Two of the counties in the WMD (Stutsman and Wells) have weed officers who are extremely diligent in their leafy spurge control efforts. They seem to know the location of every leafy spurge plant on every WPA in the county and we are continuously reminded that those plants are out there. The Wells County weed officer reported a patch of leafy spurge on the Munk WPA, a 20 acre unit in the central part of the county. It took us almost an hour to find it. The patch was in the center of the unit, in some three to four foot high brome. The only way to see this patch was to literally step right in it.

In 1990 we abandoned our policy of spraying only the spurge that was within 100 yards of WPA boundaries. This policy had accomplished three things. First, we angered our neighbors. Second, we angered the weed board, county commissioners, township officers, etc. Finally, we allowed patches on the interior of our lands to spread unchecked for three years. We initially had proposed to spray spurge once in the spring and once in the fall with two quarts of 2-4D/acre. It soon became obvious that this was not feasible due to the lack of manpower. Spurge was sprayed once in the spring with two quarts of 2-4D/acre.

The breakdown of leafy spurge sites that were treated are as follow:

County	Number of Sites	Acres Sprayed
Eddy	7	93.5
Foster	4	102.5
Stutsman	26	243.1
Wells	5	64.0
Total	42	503.1

The Tompkins WPA, a 160 acre unit in Stutsman County with approximately 100 acres of spurge on it was treated with sheep. Initial treatment began in late May with 61 ewes and 67 lambs. This number of animals was totally inadequate and additional animals were added until almost 400 sheep were on the unit by late summer. Part of the control problem we had on this unit was due to the late date that animals were first turned in. The cooperator had problems constructing the fence on the unit, due primarily to the lack of help. When we saw in early June that the spurge was flowering vigorously and the sheep were not getting the job done, we mowed all the spurge and increased the stocking rate. Once the spurge was mowed, the sheep seemed to zero in on it and they kept it eaten down for the remainder of the growing season.

The Ackerson WPA, a 320 acres unit in Stutsman County, was treated with cultivation and goats. Approximately one-half of the unit is being cultivated and one-half is in grass. The grassed portion of the unit has approximately 80 acres of spurge. Sixty yearling Angora goats were placed on the unit after the cooperator constructed the fence. The goats had a hard time keeping up with the spurge and the cooperator has purchased an additional 100 animals. We found that 60 goats could adequately control approximately 20 acres of almost solid leafy spurge. We are hopeful that the additional animals and the kids from these animals will allow good control on the entire unit.

We received one grasshopper complaint in 1990. The neighbor on the north side of the Ehni WPA in Wells County called in mid-July and said that "our" grasshoppers were eating all of his wheat. An inspection of the unit revealed that he was right. There were grasshoppers in various stages of development all over the unit with more than 50 adults/sq. yard on some parts of the unit. This unit was seeded to a DNC mix in 1989 and it appears that we got a very poor catch. The grasshoppers certainly seem to like it.

The unit was sprayed with 1.5 quarts of Sevin/acre. Ninety acres were sprayed and the neighbor never called back.

B. WPA Easement Monitoring

Seven scraper ditch, three plow furrow, five fill, and 16 burning violations were found in the Arrowood WMD in 1990. Thirty-six staff days and $7,539.50 were spent flying, checking files, ground checking, conducting landowner contacts, writing letters and making compliance checks.

We encountered a problem with SCS wetland determinations and easement violations. One Stutsman County producer received his wetland maps and noticed that one wetland was a WD. This particular wetland had an old ditch that had existed prior to the Service taking the easement and as far as we can determine it was

never cleaned out. For some reason the producer (an elderly gentleman) decided that he would clean the ditch. He filled out his 1026 and was given SCS approval to clean the ditch.

He was the original easement holder and either forgot there was an easement on the property or ignored it. In any case, he was very cooperative and restoration was completed in a timely manner.

G. WILDLIFE

1. Wildlife Diversity

A diverse habitat base exists in the WMD. Native prairie, seeded natives and various mixes of tame grasses and legumes can be found. Excellent wetland complexes still exist, especially on the Missouri Coteau. Large areas of CRP have been established in the WMD and these have contributed to an increase in pheasants, sharp-tailed grouse and deer. Both non-game and game species are common in the WMD.

2. Endangered and/or Threatened Species

On June 24, extension Bio-Tech Rick Bohn located eight piping plovers on the Crystal Springs WPA in Stutsman County. In July he located two nests on this WPA and observed young that had hatched from each nest.

Piping Plover (RB).

On May 29 five piping plovers were observed at Lake Coe in Eddy County on a peninsula that has been cut off with an electric fence. On July 19 Carmen Luna and Bob Johnson observed two adults and three downy young on this peninsula.

Piping plover nest (RB).

3. Waterfowl

A. Spring Migration - 1990

On March 9, 1990 one Canada goose was seen three miles south of Carrington in Foster County. A flock of pintails was seen in northeastern Stutsman County on March 11. Nine mountain bluebirds were at Arrowwood headquarters on March 17, a mourning dove was seen on March 18 and a northern harrier on March 19. White-fronted geese were seen over Arrowwood on March 27 and numerous mallard flocks on March 27. A major snow goose movement took place between March 29 and 31. Hooded mergansers and canvasbacks were seed at Arrowwood on March 31, tundra swans and ring-necked ducks on April 1, the first white pelicans and sandhill cranes on April 7 and great blue herons and belted king fishers on April 9.

Some small wetlands were open on March 20 and the ice went out on Arrowwood lake on April 13.

Seven species of waterfowl (RB).

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 WMD, 200 wetlands on 34 scattered four-square mile plots were counted. Approximately 50 staff days were spent conducting the counts. This included flying the aerial video surveys, preparing aerial photos and nest cards, conducting the counts and compiling and checking the cards before they are shipped to the Bismarck WHO office where the breeding pairs and production are estimated.

C. Fall Migration - 1990

Water conditions in the WMD in the fall of 1990 were very poor. Virtually all seasonal and many semi-permanent wetlands were dry. October and November were very dry. Temperatures were quite moderate throughout the period.

Scattered flocks of small Canada Geese and a few snow geese were present in the WMD for the opening of goose season on September 29. Ducks appeared to be fairly plentiful on October 6 (opening day of duck season) because the few wetlands with water were all holding

Table 1. Breeding Pairs for Five Dabbling Duck Species at Arrowwood Wetland Management District, North Dakota 1987-1990.

20 A.

SPECIES	OWNERSHIP	PAIRS 1987	PAIRS 1988	PAIRS 1989	PAIRS 1990	PAIRS/SQ. MILE 1987	PAIRS/SQ. MILE 1988	PAIRS/SQ. MILE 1989	PAIRS/SQ. MILE 1990
Mallard	Easement	7,573	7,950	7,043	5,760	11.52	12.09	10.74	8.78
	Federal	867	1,103	1,350	1,490	10.01	12.74	15.76	17.40
	Private	26,814	26,107	24,926	21,022	6.54	6.37	6.03	5.08
	TOTAL	35,254	35,160	33,319	28,272	7.28	7.26	6.83	5.80
Gadwall	Easement	7,490	2,850	6,857	7,799	11.39	4.33	10.46	11.89
	Federal	1,041	499	1,638	2,610	12.02	5.76	19.13	30.49
	Private	26,716	9,531	24,732	29,312	6.52	2.32	5.98	7.09
	TOTAL	35,247	12,880	33,227	39,721	7.28	2.66	6.81	8.14
B-W Teal	Easement	29,582	16,350	11,111	6,545	44.78	24.87	16.94	9.98
	Federal	3,014	1,959	1,852	1,426	35.25	22.62	21.63	16.66
	Private	104,332	53,170	38,922	23,507	25.34	12.97	9.41	5.68
	TOTAL	136,928	71,479	51,885	31,478	28.15	14.76	10.64	6.45
Shoveler	Easement	4,065	1,318	2,247	1,110	6.18	2.00	3.42	1.69
	Federal	511	205	480	327	5.90	2.37	5.60	3.82
	Private	14,442	4,365	8,024	4,109	3.52	1.06	1.94	0.99
	TOTAL	19,018	5,888	10,752	5,546	3.93	1.22	2.20	1.14
Pintail	Easement	1,546	1,542	989	301	2.30	2.35	1.51	0.46
	Federal	158	185	165	66	1.93	2.13	1.93	0.77
	Private	5,453	5,016	3,466	1,081	1.30	1.22	0.84	0.26
	TOTAL	7,157	6,743	4,620	1,447	1.45	1.39	0.95	0.30

Table 2. Recruits Produced for Five Dabbling Duck Species at Arrowwood Wetland Management District, North Dakota, 1987-1990.

20 B.

SPECIES	OWNERSHIP	PRODUCTION 1987	1988	1989	1990	YOUNG/SQUARE MILE 1987	1988	1989	1990
Mallard	Easement	5,266	3,350	3,832	3,101	8.01	5.10	5.84	4.73
	Federal	1,522	611	829	867	17.58	7.05	9.68	10.13
	Private	18,492	10,790	15,109	10,829	4.51	2.63	3.65	2.62
	TOTAL	25,280	14,751	19,770	14,797	5.22	3.05	4.05	3.03
Gadwall	Easement	10,222	1,977	5,996	6,676	15.55	3.01	9.14	10.18
	Federal	1,960	314	1,173	1,821	22.63	3.63	13.69	21.27
	Private	37,532	7,045	25,386	25,581	9.15	1.72	6.14	6.18
	TOTAL	49,714	9,336	32,555	34,078	10.26	1.90	6.67	6.99
B-W Teal	Easement	39,328	10,186	8,752	4,962	59.82	15.50	13.35	7.57
	Federal	5,210	1,110	1,141	850	60.16	12.82	13.33	9.93
	Private	141,159	35,793	37,096	19,307	34.43	8.73	8.97	4.67
	TOTAL	185,697	47,089	46,989	25,119	38.34	9.72	9.63	5.15
Shoveler	Easement	4,922	952	2,006	1,001	7.49	1.45	3.06	1.53
	Federal	908	119	316	210	10.49	1.38	3.69	2.46
	Private	17,341	3,274	8,337	3,689	4.23	0.80	2.02	0.89
	TOTAL	23,171	4,345	10,659	4,901	4.78	0.90	2.19	1.00
Pintail	Easement	1,203	560	460	133	1.83	0.85	0.70	0.20
	Federal	141	56	55	21	1.63	0.64	0.64	0.24
	Private	4,227	1,995	1,913	519	1.03	0.49	0.46	0.13
	TOTAL	5,571	2,611	2,428	673	1.15	0.54	0.50	0.14

birds. Hunting pressure was very light throughout the season. One group of Minnesota hunters arrived at their favorite Stutsman County marsh well before dawn on one Saturday morning. They proceeded to get their gear all ready to go only to discover that the marsh was dry.

Most area wetlands, what few there were, froze up by mid-November. Scattered flocks of Canada geese and mallards, as well as a few snow geese, remained right to the end.

D. Nest Structures

A total of 155 cone-type nest structures were checked in the Arrowwood WMD in 1990. Only five structures were used, three by Canada geese and two by mallards, with one of the mallard nests predated before hatching.

Low water conditions allowed easy access to nesting structures (RB).

Obviously, we are not pleased with an occupancy rate of three percent. Dry conditions throughout the WMD contributed to the low occupancy rate, but there are other factors at work. Mallard populations are down, and we really don't know what long term changes have occurred in wetlands. Are WPA wetlands still as attractive as breeding sites? Has the invertebrate composition changed drastically due to chemical inputs from off service lands? Are vegetative changes having a negative impact? These are unknown factors which may or may not be having an impact. Obviously,

something has changed.

E. Predator Removal

Due to extremely poor water conditions and an extremely tight budget we did not conduct any predator removal activities on WPAs in the WMD in 1990. We believe, based on past results, that this can be a cost-efficient and effective way to increase waterfowl production if conducted over a large area, with a good wetland complex and high numbers of breeding waterfowl.

4. Marsh and Water Birds

Large numbers of greater and lesser sandhill cranes can be found in the western part of the WMD during spring and fall migration. Western Stutsman and southwestern Wells counties are used very heavily by cranes.

White pelicans and double-crested cormorants from the breeding colonies at Chase Lake NWR are seen frequently feeding in wetlands in the WMD.

When water levels are suitable in the WMD there are large eared-grebe nesting colonies on the Mud Lake and Cleveland Slough WPAs in Stutsman County. Unfortunately, low water levels in 1990 prevented the establishment of these colonies.

Sora and Virginia rails, pied-billed grebes, American bitterns, great blue herons, and black-crowned night herons nest in the WMD, although not in any substantial numbers. These species are also seen fairly frequently throughout the WMD.

6. Shorebirds, Gulls, Terns, and Allied Species

Numerous species of shorebirds use the WMD during the spring and fall migration. Sandpipers, dowitchers, semi-palmated plovers, ruddy turnstones, golden and black-bellied plovers were seen in the WMD in 1990. Low water levels, which exposed large areas of mud flats, created excellent shorebird habitat throughout the WMD.

Willets, marbled godwits, upland sandpipers, and Wilson's phalaropes nest in the WMD. These species prefer open native prairie with grasses that are fairly short. Common snipe and greater and lesser yellowlegs can be seen throughout the WMD with snipe being a relatively common breeding species. Killdeer and American avocets are very common breeding species.

Franklin's gulls and black terns have nested in the WMD, but low

water levels have eliminated many of their traditional nesting sites. California and ring-billed gulls also nest in the WMD.

6. Raptors

Red-tailed hawks, Swainson's hawks, Northern harriers, American kestrels and great-horned owls are common nesting species in the WMD. Ferruginous hawks and short-eared owls nest in the WMD, but are not considered common.

Cooper's hawks and sharp-shinned hawks are seen occasionally in the WMD as are goshawks and prairie falcons. An occasional Peregrine falcon is also observed. Even more infrequent are observations of burrowing owls.

Bald and golden eagles are seen during spring and fall migration periods with golden eagles sighted occasionally during the winter.

7. Other Migratory Birds

Two mourning dove survey routes are censused in the WMD. One route is in Foster County (Carrington), and one is in Wells County (Harvey).

Results of the mourning dove call counts are listed below:

Harvey Route:	Year	#/Total Calls
	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
	1990	57/Not Recorded
Carrington Route:	1981	No Count
	1982	54/333
	1983	22/160
	1984	27/133
	1985	48/260
	1986	40/257
	1987	52/371
	1988	78/Not Recorded
	1989	77/Not Recorded
	1990	69/Not Recorded

8. Game Mammals

A. Large Mammals

White-tailed deer are common throughout the WMD. No surveys have been conducted during the past two years because of a lack of snow cover. General observations indicate that the deer herd in the district is thriving. Does with triplets are not uncommon and most animals are in extraordinary condition.

The large amount of CRP in the district has had a significant effect on the deer herd. Many animals are now wintering on CRP acres. Although we have not been able to fly a deer census in the past two years, due to lack of snow, it appears from general observations that fewer deer are wintering in traditional areas. Accurate censusing of the deer herd has become much more difficult and establishing the proper number of licenses for the deer season is also more complicated.

(RB)

Another impact that CRP has had is providing large areas of escape cover. North Dakota deer hunters that hold buck tags want to shoot big, trophy bucks. The CRP acres now provide a place that those bucks can use effectively to avoid hunters. The CRP acres are often very difficult to walk in because of the thick cover and hunters won't make the effort.

Occasional reports of moose sightings in the WMD are received.

Special effort are not made to verify these observations because these sightings are not that uncommon.

B. Small Mammals

Red fox, raccoon, and striped skunk, the three major nest predators are common throughout the WMD. Coyotes are increasing in some areas and badgers and mink are also fairly common.

This North Dakota red devil was called to the photographer with a predator call (RB).

Muskrats are down significantly as a result of the drought. When the water returns the rats will be back to the wetlands. Beaver numbers are also down.

Thirteen-lined, Richardson's and Franklin's ground squirrels are also found in the WMD. Franklin's are significant and effective nest predators. They remove eggs from a nest one by one until there are none left.

Short-tailed and least weasels, porcupines, cottontail and white-tailed jack rabbits are found throughout the WMD. Jack rabbit numbers have been suppressed for a number of years. The reason(s) for their low numbers are unclear.

10. Other Resident Wildlife

Hungarian (gray) partridge and sharp-tailed grouse are common throughout the WMD with grouse populations higher in the western part of the district. It appears that the combination of several mild winters and large areas of CRP have had a very positive impact on these species. The numbers of both appeared to be up significantly in the fall of 1990.

The ring-necked pheasant has also benefitted tremendously from the CRP program and from an aggressive winter feeding project conducted by the Stutsman County Wildlife Federation. The Federation has contracted with local landowners for food plots and have placed feed bales in many areas of the county. As a result, the pheasant population in Stutsman County has increased significantly.

11. Fisheries Resources

There is one fee title fishery in the WMD. A portion of the shoreline of Barnes Lake in Stutsman County is owned in fee title. The lake itself is a meandered body of water. The walleye fishery in this lake has been excellent for the past several years. A good northern pike fishery also exists in the lake and an occasional jumbo yellow perch is also caught. The lake level has been dropping steadily for the past three years as a result of no spring runoff and below normal precipitation. Winter and/or summer kill is a very real possibility unless water levels improve.

No fish were stocked in Barnes Lake in 1990 by the North Dakota Game and Fish Department.

12. Wildlife Propagation and Stocking

Valley City WMD and Chase Lake Prairie Project staff coordinated the banding and release of wild strain, hand reared mallards on a private marsh in Stutsman County. Lake Louise and Chicago Lake were not used as release sites this year because of the on-going legal proceedings between the Service, North Dakota Game and Fish and a group of private landowners concerning who is going to purchase the Aetna Land adjacent to Chase Lake NWR. The 7000+ acre parcel is some of the best remaining native prairie in the state.

These releases are designed to test the effectiveness of supplementing wild mallard populations with hand-reared wild-strain mallards. The captive breeding flock consists of birds that hatched from eggs taken from islands scattered throughout North Dakota.

Additional waterfowl species have also been released. These birds came from eggs obtained through the egg salvage program. 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. All of the mallard propagation activities are conducted at this facility as well.

The number of birds released in 1990 is summarized in the following table.

Birds Banded and Released in 1990

	Male	Female	Total
Mallard	1,376	1,566	2,942
Gadwall	65	82	147
Pintail	2	6	8
Shoveler	5	7	12
Wood Duck	50	54	104
Blue-Winged Teal	10	15	25
TOTAL	1,508	1,730	3,238

A total of 160 hens were individually marked with nasal disks.

15. Animal Control

Blackbird depredation complaints are received regularly in the late summer and fall. These are referred to USDA for action. As part of the North Dakota private lands extension program that is now in place, we can work with private landowners to reduce blackbird roosting sites in cattail choked wetlands. The landowner is paid to disc each wetland acre of cattails after the basin has been burned. The payment is $5.00/acre for each discing operation and up to $4.00/acre for burning the wetland, depending on how difficult it is to complete the burn.

If the operation is successful, there will be two significant benefits. Blackbird roosting habitat will be significantly reduced and wetlands that had little or no waterfowl use due to the lack of open water will become attractive to waterfowl once again. Our goal with this program is not to eliminate cattails, but rather to eliminate large, solid blocks of cattails that are attractive as blackbird roost sites and unattractive to waterfowl. We hope to achieve a 50:50 mix of cattails and open water.

In 1990 we were able to write extension agreements with six landowners to treat 120 acres of cattail-choked wetland.

For the second year in a row we did not receive any deer depredation complaints. This was due primarily to the lack of snow cover. In Stutsman County, where we have received most of the complaints, the efforts of the Stutsman County Wildlife Federation in establishing food plots and placing out feed bales has most certainly contributed to a reduction in deer depredation activities.

We did receive one rather unique deer complaint in 1990. A woman who lives in the town of Medina in Stutsman County called to complain that deer were coming into town to her house and eating her flowers and vegetables in her garden. We told her to try spreading blood-meal around the flowers and in the garden, leaving her dog outside at night or turning on a radio in the garden. She never called back.

Although there were excellent crops in many areas of the district last year, we did not receive any waterfowl depredation complaints. Depressed waterfowl populations and the scarcity of wetlands combined to virtually eliminate this potential problem.

16. Marking and Banding

All the ducks released in Stutsman County were banded with standard FWS bands. In addition, 160 female mallards were marked with a unique color/shape combination of nasal disks for identification of individual birds in future years.

17. Disease Prevention an Control

Several WPAs in the WMD are traditional botulism problem areas. All of the wetlands with a history of botulism outbreaks were dry in 1990.

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. The rest area was closed for most of the summer in 1990 because a new building that houses the restrooms was being constructed by the North Dakota Highway Department.

We hope to upgrade the interpretive display that we have at the rest stop by constructing a kiosk, adding additional interpretive materials and perhaps establishing a display area of seeded native grasses.

The WPA sign that we have at Crystal Springs was overhauled in the summer of 1990. A portion of the sign that read "Bureau of Sport Fisheries and Wildlife" was removed (finally), all of the loose and flaking paint and filler material that was used to create the display on the sign was removed and the sign was completely repainted. The Arrowwood NWR YCC crew completed this task and did an excellent job.

8. Hunting

Waterfowl Production Areas in the WMD are used by upland game, waterfowl, and big game hunters.

Opening weekends generally see the heaviest use although during the deer gun season fairly heavy pressure continues throughout the entire season.

A very proud local deer hunter (CRL).

Non-resident hunters often come to North Dakota with little or no knowledge concerning trespass laws with no local contacts and quite often with no idea of where to hunt. These folks utilize WPAs very heavily and quite often the success or failure of their hunting trip depends upon how many WPAs they can find to hunt on.

Intrest in sandhill crane hunting increases every year. Sandhill cranes can be found throughout most of the western half of the WMD

during the fall hunting season. Hunters are allowed to harvest three cranes each per day (possession limit of six) during the first half of the season (20 days) and one crane the remaining half of the season (15 days).

Sandhill crane hunters (RB).

9. Fishing

Barnes Lake in Stutsman County is a popular fishing spot with a good walleye and Northern pike fishery. The North Dakota Game and Fish Department has constructed a boat ramp on the west side of the lake that is used heavily during the summer. The lake is also popular for ice fishing. Two to four pound walleyes are common and northerns up to 15 pounds are taken.

10. Trapping

Waterfowl Production Areas are open for public trapping in accordance with state regulations. No special permits are needed. Interest in trapping has diminished considerably in the past several years. Low fur prices have certainly had a major impact on the trapping effort. Some of the old die-hards are still trapping, but they are definitely in the minority. The furbearer populations throughout the WMD are quite high and they are having a significant

impact on ground nesting birds. In some areas red fox are at record high levels. More trappers and a stronger trapping effort could play a beneficial role in reducing the number of mammalian nest predators. It doesn't appear that fur prices will be increasing any time soon and the trapping effort on WPAs will, in all likelihood, remain low.

11. Wildlife Diversity

North Dakota is a rural state and the people that live here are used to seeing wildlife wherever they go on a regular basis. Most North Dakotans do not make a conscious effort to go out and observe wildlife because they take it for granted. There is very little wildlife observation activity on WPAs that involves local people. Non-residents are a different story altogether. We do have a fair number of birders that visit the district and most of them are very knowledgeable and have several species that they are interested in locating. People from the heavily populated areas of the east and west coast are very pleased with the amount and variety of wildlife that exists here and they take full advantage of all the opportunities that they have to just go out and watch the wildlife that is out there. It is very gratifying to meet people who are so enthusiastic about going out observing, and photographing wildlife. That is non-consumptive use at its best.

15. Off-Road Vehicling

Unauthorized use of motor vehicles on WPAs is a problem that never seems to end and is almost unsolvable. On very rare occasions, when we observe someone driving on a WPA, we issue a citation, but the odds of apprehending someone are very minute. Signs, fences, and news releases all seem to do little good. Hunters, farmers, people on snowmobiles, four-wheelers, trail bikes and those that are just out joy-riding in their cars or pickups are all guilty. It is an unfortunate situation that won't be easily solved and we will just have to deal with it as best we can.

17. Law Enforcement

LE patrols are conducted during the waterfowl, upland game and big game seasons. During the opening weekends all LE officers are in the field and at least one officer works during the remaining weekends. If hunting pressure picks up during the season, additional staff conduct patrols.

Citations issued in the WMD during 1990.

Date	Violation	Case Disposition
9/29	Goose hunting w/out duck stamp. (16 year old juvenile)	State
10/6	Exceed possession limit of hen Mallards (2)	$50.00 bond paid
10/6	Exceed daily bag limit of Canada Geese (2).	$50.00 bond paid
10/3	Exceed daily bag limit of ducks (4).	$50.00 bond paid
11/24	Big game hunting in closed area.	$100.00 bond paid
11/24	Eleven year old juvenile big game hunting in closed area. (Minimum age to hunt deer in ND is 14.)	State

I. EQUIPMENT AND FACILITIES

1. New Construction

The long awaited oil and paint shed was finally constructed. It is a steel building and unfortunately, many of the panels were scratched sometime during the construction process and will have to be repainted to prevent rust problems. Final payment on the contract will not be made until the problems with the scratched panels are resolved.

The new oil and paint shed (PVN).

4. Equipment Utilization and Replacement

The engine was replaced in Long Lake's one ton truck.

The Brakes in the Ford 3/4 ton spray truck were overhauled.

The clutch was replaced in an S-10 and a 1/2 ton 4x4.

A John Deer 1010 tractor with a sickle bar mower was purchased.

A 30 ton electric hydraulic press was added to our shop equipment as was a tire changing machine.

Tub enclosures, ammo boxes, winter coats and boots, raingear, eye protection, oil, tub enclosures, bi-fold doors and electric wire were among the items obtained on surplus from the Grand Forks Air Force Base.

J. OTHER ITEMS

1. Cooperative Programs

The private lands extension program took a major leap forward in February with the hiring of Rick Bohn, our extension bio-tech. Rick's activities for the year were many and varied.

Letters were sent to all CRP contract holders in the WMD. Rick handled the letters for Eddy and Foster counties while the Bismarck WHO sent letters to Stutsman and Wells counties.

As a result of these letters, contacts in the field, neighbors telling neighbors, studying aerial photos, and noticing potential projects while driving around, 140 landowners were actually talked to. The breakdown of interests was:

Grazing Systems-	24	
Idle Grassland/Pasture-	35	
Cattails-	18	
Restore Wetlands-	20	(160 potential basins)
Wetland Manipulation-	5	
Sweetclover Seeding-	5	
Islands/Cutoffs-	3	

A number of landowners are interested, but are holding back because of problems with the farm program (5), not enough money (2), and plain thinking about it (5).

Approximately one-half of Rick's time was spent on paperwork or working on projects that fell through. The permit process for many projects is long, complicated, and time consuming. Permits are

often required from the Corps of Engineers, the State Water Commission, the State Health Department, the State Historic Preservation Officer and County Water Boards.

Twenty-eight extension agreements were signed by landowners in the WMD in 1990. Twenty-three wetland basins with a total of 76.2 acres were restored and 13 basins with a total of 26 acres were created.

One of Rick's many restored wetlands (RB).

Rick Bohn banding flax bales (CRL).

A total of 345 flax bales were banded, landowners were interested and the process of placing the bales began. Due to the lack of help from most wildlife clubs, some of the bales were not placed. The Medina Wildlife Club and Stutsman County Wildlife Federation provided much appreciated assistance in placing many of the bales.

Additional agreements involved cattail manipulation (over 100 acres), sweetclover interseeding (41 acres), preliminary work on two grazing systems, one island construction project and preliminary work on another island construction project.

2. Items of Interest

The first decline in the buildup of nests since 1987 on the Lake Coe peninsula cutoff in Eddy County occured in 1990. The water level of the lake continues to drop. Six, 16-foot cattle panels, have been added to the west side of the fence and three panels have been added to the east side in order to reach the water. The peninsula is almost connected to the mainland on its south side. Approximately ten yards of knee deep water remain before the peninsula is no longer a peninsula. Predator access continues to improve and if a fox or coyote finds access to the peninsula, the nesting effort can be wiped out. We will continue our attempts to

keep the peninsula free, but if water levels continue to fall, our chances of success are slim. A summary of nesting data at Lake Coe for the past four years can be found in the following table.

	Number of Nests				Number Hatched			
Species	1987	1988	1989	1990	1987	1988	1989	1990
Mallard	9	9	7	5	5	6	5	3
Pintail	0	2	2	1	0	1	2	0
Gadwall	22	39	47	30	19	29	24	18
Shoveler	2	0	2	0	1	0	0	0
B-W Teal	7	5	3	1	4	4	3	0
L. Scaup	13	35	52	35	7	23	27	17
TOTAL	53	90	113	72	36	63	61	38

Canada geese goslings (RB).

One successful Canada goose nest was also found on the peninsula in 1990. Piping plovers once again found the peninsula a suitable nesting site (see section G-2).

The peninsula was trapped by a contract trapper this year and only one raccoon was captured as compared to eight raccoons that were removed in 1989 when the peninsula was trapped force account.

After several years of trying, we were finally able to see an electric predator exclosure completed on the Thiesen WPA in Stutsman County. This 62 acre exclosure is located in an area with a superb wetland complex. The area has always had very high pair

numbers and large numbers of nests with very low nest success. The potential for production inside this fence is very high. Unfortunately, all of the wetlands in the area are now dry. Eleven nests were found inside the fence in 1990 and all were successful.

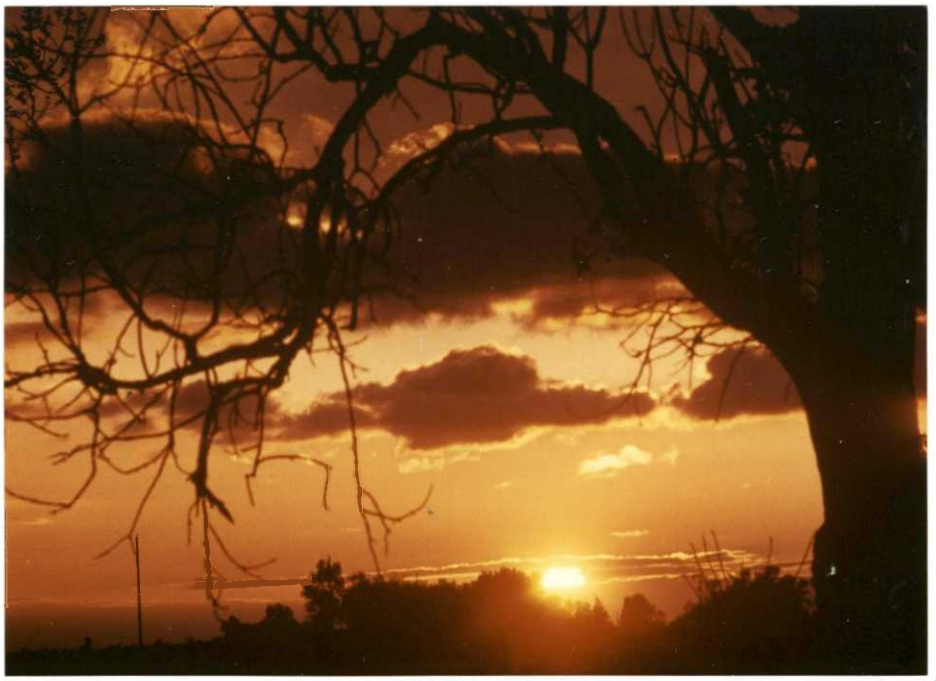
3. Credits

Bob Johnson wrote the narrative, Mary Beth Schuchard did the word processing and assembling, and Carmen Luna did the editing.

K. FEEDBACK

We have made great strides in the past several years with our extension program on private lands in North Dakota. Many wetlands have been restored and created. We have started to put a lot of effort into cattail management, grazing systems, using sweetclover as a green manure plowdown, leaving stubble in the fall, no-till farming and establishing grass cover.

I am concerned that we are leaving out a big part of the puzzle. We really haven't given a lot of attention to predator management. Electric fences, islands and peninsula cutoffs have been built, but we're not addressing the root of the problem. We are overrun with foxes, skunks, and raccoons. Unless we can come up with some kind of management plan to bring these species back into balance all of our other efforts will not have the impact that they could and should have. We need to act now before it's too late. The future of the waterfowl resource in this country depends on it.



(RB)

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 designated wilderness area.

B. CLIMATIC CONDITIONS

As drought conditions persisted, the lake level continued to drop in 1990. No records are kept of climatic conditions at Chase Lake NWR. The nearest weather station is at Pettibone, approximately ten miles northwest of Chase Lake. However, this area, like the rest of central North Dakota, received substantial rainfall in June. The rainfall did little towards recharging wetlands but provided much needed moisture for the parched grasslands.

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

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

In and around Chase Lake NWR the wetlands are varied. Chase Lake is a large permanent saline wetland. Located in the proximity of Chase Lake is several fresh water wetlands including one impounded semi-permanent, three naturally occurring semi-permanent, one large fen area and several temporary and ephemeral wetlands. The diversity of wetlands in and around Chase Lake NWR add to the area's attractiveness for migratory birds.

Chase Lake NWR is the large wetland basin in the background. Lake Louise is centrally located in the photo. Note the 46 acre island that was created by physically cutting off the peninsula. This was the first private land joint venture between Ducks Unlimited, Inc., USFWS, and a private landowner in North Dakota. Chicago Lake (foreground) has demonstrated its wetland values for migratory waterfowl by providing fall migration habitat for several thousand ducks and geese.
Photo by Rick Bohn.

5. Grasslands

Established stands of tame grasses and legumes dominate the uplands habitat on the refuge. However, remanent tracts of native prairie that are primarily blue grama and green needle grass persist. Prickly pear and ball cactus are common in the native grasslands.

9. Pest Control

Leafy spurge infestations occur on the refuge and were treated with 2,4 D.

10. Water Rights

The test wells for Chase Lake NWR Hydrology study were not sampled in 1990.

G. WILDLIFE

1. Wildlife Diversity

The variety of wetlands associated with the refuge enhances the areas attractiveness for wildlife diversity. Chase Lake is a large alkali wetland typical of glacial outwash deposits in the Prairie Pothole Region. Typical avian species of such wetlands are American avocet, piping plover, killdeer, spotted sandpiper, willet, marbled godwit and Wilson's phalarope. Colonial nesters (white pelicans, double-crested cormorants, ring-billed and California gulls and common terns) add considerably to the refuges wildlife diversity.

3. Waterfowl

Large numbers of shovelers and gadwalls were present during late September and early October. Several thousand Canada geese, snow geese, and Tundra swans were using the refuge by late October. Tundra swans loaf on the shores of the islands but leave the refuge to feed.

4. Marsh and Water Birds

Chase Lake NWR is an annual fall migration stop for several thousand sandhill cranes. Roosting in the shallow water shoreline area the cranes leave each morning to feed in nearby stubble field. Four whooping cranes were spotted late one afternoon with a flock of several hundred sandhill cranes. The whoopers were sighted the following morning flying with a flock of sandhills. However, where they were feeding could not be determined due to heavy fog. The whoopers were not seen or reported again in the Chase Lake area.

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

	Year	# of Pelican Nests	# of Cormorant Nests
Small Island	1986	2,087	26
	1987	1,855	0
	1988	3,100	65
	1989	2,313	39
	1990	1,824	*

	Year	# of Pelican Nests	# of Cormorant Nests
Large Island	1986	2,908	131
	1987	5,283	445
	1988	5,540	288
	1989	4,316	249
	1990	3,960	*
TOTAL	1986	4,995	157
	1987	7,138	445
	1988	8,640	353
	1989	6,629	288
	1990	5,784	*

* Unable to count due to Black & White photography.

Adult white pelicans and pod of young spending an enjoyable day at Chase Lake NWR. photo by USFWS

5. Shorebirds, Gulls, Terns, and Allied Species

Several thousand California and ring-billed gulls nest on the island 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

Sharp-tailed 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

Since the Chase Lake NWR has become the focal point of the Chase Lake Prairie Project visitor use has increased. Promotion of the area has come from a variety of sources including ND Tourism Department travel brochures, Jamestown area Chamber of Commerce, North American Waterfowl Management Plan, and many outdoor and producer (farming) publications. No exact quantification of visitors has been documented but tours provided to congressional staffers, professional organizations (e.g. Range Society), 4-H groups, university students (e.g. ecology and waterfowl biology classes), and visiting NAWMP administrators account for several hundred visitors. As the interest in non-game resources continue to gain momentum and the continued emphasis of the area as a major NAWMP initiative visitor use will continue to increase.

During the state deer season the refuge receives several hundred hunter visits. Although harvest rates are low it is perhaps due to the designated wilderness status. No vehicles are allowed to enter the refuge for any reason so retrieving a downed animal can be quite exhausting. So it is the elusive "Big Buck" that is pursued in earnest on Chase Lake NWR.

J. OTHER ITEMS

2. Items of Interest

The peninsula cutoff barrier fence was operational in 1990. As water level continued to drop, additional end panels were added to maintain the effectiveness of the electrical barrier. No nest searches were initiated during 1990.

3. Credits

Greg Siekaniec wrote the narrative. Kathy VanNingen did the word processing.

Johnson Lake NWR

JOHNSON LAKE NATIONAL WILDLIFE REFUGE

Johnson Lake National Wildlife Refuge is a 2,007 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 of 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 1990.

One goose tub was installed on Halfway Lake in 1990 by a local landowner.