

J. Clark Salyer National Wildlife Refuge

Upham, North Dakota

Annual Narrative Report

Calendar Year 1992

*U.S. Department of the Interior
Fish and Wildlife Service
National Wildlife Refuge System*

REVIEW AND APPROVALS

J. Clark Salyer National Wildlife Refuge

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Refuge Manager



Date



Refuge Supervisor Review



Date



Regional Office Approval



Date

INTRODUCTION

The J. Clark Salyer National Wildlife Refuge is located along the Souris River in Bottineau and McHenry Counties of north-central North Dakota. The refuge was established by Executive Order Number 7170 on September 4, 1935, as a refuge and breeding ground for migratory birds. The 58,700-acre refuge extends from Canada southward for approximately 45 miles. The nearest town is Upham, North Dakota, located about three miles from refuge headquarters.

Included within the refuge are 36,000 acres of upland habitat composed of native and introduced grasslands, thick woodlands, shrub thickets and croplands. The northern portion is basically confined to the river valley with a narrow band of adjacent upland habitat. The southern portion of the refuge contains about 16,000 acres of native prairie interspersed with aspen and brush covered sandhills and 4,200 acres of wooded river bottom.

Wetland habitats include high value managed deep and shallow marshes within the Souris River flood plain. Five dikes with water control structures have restored 23,000 acres of open water, marsh and wet meadow habitat for waterfowl production and migration use.

While the primary objective of the refuge is waterfowl production, the area has a very diverse population of other bird species. More than 250 species have been noted, including sharp-tailed grouse on their dancing grounds in spring; Swainson's hawks in great numbers in fall; a wide variety of waterbirds, including five species of nesting grebes; and relatively rare small birds such as Sprague's pipits and Baird's and LeConte's sparrows.

More than 125 species nest on the refuge, some in great numbers. Up to 17,000 Franklin's gulls and colonies of hundreds of double-crested cormorants, great blue herons and black-crowned night herons are found. In an average year, about 18,000 ducklings are produced, including pintail, mallard, gadwall, green-winged teal, blue-winged teal, American wigeon, northern shoveler, black duck, wood duck, redhead, ring-necked duck, canvasback, lesser scaup, and hooded merganser. White pelicans are present on the refuge all summer, while thousands of sandhill cranes, tundra swans, and snow geese use the refuge as a feeding and resting area during migration.

The entire refuge lies within an area which was once Glacial Lake Souris. The surrounding area is old lake bottom with extremely flat topography and a high density of temporary wetlands. These are important for waterfowl production and natural flood storage which improves water quality in the Souris River. Unfortunately, a substantial portion of the original wetlands have been drained.

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A. HIGHLIGHTS

Our long awaited biologist EOD January 26. (E.1)

The summer of 1992 was one of the coolest on record. (B)

Construction on the Souris Basin project was essentially completed. (I.1)

A large prescribed fire for aspen control in the Sandhills was completed. (F.9)

B. CLIMATIC CONDITIONS

A refuge weather station was maintained during 1992 as an official weather record for the National Oceanic and Atmospheric Administration.

Not since 1934 and 1936 has it been so dry. These were the only two years where total precipitation was less than 9 inches since records were started in 1892. The miraculous part to this year was that some of the best crops ever were grown. Some farmers reported the best yields of any year since they had been farming. This was the direct result of cool temperatures throughout the growing season and the abundant soil moisture left over from the snow.

Because of the heavy snowfall in the fall of 1991, we started the year with a very good snowpack. Before the spring thaw, there were up to 4 inches of water available in the snowpack. This measured up to 16 inches deep in areas north and east of Upham. Temperatures were mild all winter so wildlife had it easy. The coldest temperature of the year was a -30°F on January 18.

By mid-March the snowmelt was complete in the Upham area and very good runoff volumes were produced in tributaries on the eastern side of the Souris River. Hurricane Lake and several WPAs were filled to overflowing. Hong and Cruden WPA's were filled as was Rush Lake WPA. Many of these areas dried out by fall, but some still held water such as Cruden WPA and the main Hurricane Lake.

Although rainfall during the growing season was less than half the normal, the cool temperatures caused many small grain fields to do very well. Grasslands and row crops did poorly, probably due to either low rainfall or temperatures. Ice went out of refuge pools on April 16. The last frost of the spring was 26°F on May 23. Some damage occurred to croplands, trees and gardens because of this late frost. The first freezing temperature in the fall was 24°F on September 22.

A total of 13 days had 90 degree or greater temperatures and most of these were in August during harvest. The high temperature for the year was 100°F on August 8.

Total precipitation for the growing season, April through September, was 6.18 inches compared to the normal of 12.96 inches.

During the fall, the weather was mostly warm and dry until November when it began to snow. By the end of the year we had 11 inches of snow on the ground. Refuge pools froze solid on November 14.

Total precipitation for 1992 was 8.93 inches or 7.68 inches below the normal of 16.61 inches. Total snowfall was 39 inches.

D. PLANNING

2. Management Plan

Several refuge management plans need revision. Collection of information for revision of the water management plan continued during the year, but took a back seat behind other priorities. This plan needs to be updated to provide input to the joint Souris River Basin Management Plan being developed by the Service and the State of North Dakota. Grant completed an extensive literature review for development of the plan. Some data have been collected, but more information is needed on vegetative responses and conditions before implementing a plan to better manage the refuge pools. All refuge pools were photographed in May to get an idea of open water/emergent vegetation interspersation.

4. Compliance with Environmental Mandates

Most refuge projects this year fell into the realm of categorical exclusions. Compliance activities included:

- a. Section 7 certification of the refuge hunting program was completed.
- b. The Souris River Flood Control Project was monitored throughout the year for compatibility compliance, and construction plans were adjusted to minimize adverse impacts and maximize wildlife benefits. We ended up taking fill material from areas in the flood plain to create 22 small wetland basins. These were not part of the project mitigation requirements, but were covered by our right-of-way document and Special Use Permits and negotiated out on the ground.

5. Research and Investigations

Grant completed a predator exclosure nesting study. Preliminary data show nest success (apparent) was higher inside the fence with predator control: 73.5 percent (102 nests) inside versus 47.8 percent outside. Mayfield estimates, density calculations and more detailed analysis were postponed until after the field season.

Grant also finished up the field portion of a waterfowl nesting island study. Analysis of these data are pending as well. Fourteen islands with predator control had 985 duck nests and 119 goose nests. Fourteen control islands (i.e. no predator control) had 235 duck nests and 35 goose nests.

E. ADMINISTRATION

1. Personnel



Front Row: Erickson, Eslinger

Back Row: Gillund, Jacobs, Howard, Dockter, Grant, Opdahl, April

1. Robert L. Howard, Refuge Manager, GM-13, PFT
2. Gary Erickson, Assistant Refuge Manager, GS-11, PFT
3. David Gillund, Wetlands Manager, GS-11
4. Ann M. (Smykaj) Timberman, Assistant Refuge Manager, GS-7, PFT, Transferred to LaCreek NWR, 2/2
5. Todd Grant, Wildlife Biologist, GS-9, EOD 1/92
6. Gary Eslinger, Biological Technician, GS-7, PFT
7. Wanda Opdahl, Refuge Assistant, GS-6, PFT
8. Robert April, Automotive Mechanic, WG-10, PFT
9. Duane Dockter, Maintenance Helper, WG-7, CS
10. Lynn Pluhar, Motor Vehicle Operator, WG-6, CS, Transferred to Waubay NWR, 2/92
11. Bradley Jacobs, Extension Biological Technician, GS-5, Temp
12. Chase Marshall, Biological Aid, GS-3
13. Paul Halko, Biological Aid, GS-3
14. Rodd Compson, Biological Aid, GS-3
15. Tony Jacobson, Biological Aid, GS-3
16. Gary Williams, Coop Student, GS-3



Front Row: Marshall, Jacobson, Williams

Back Row: Christianson, Dan Howard, Paul Halko, Rodd Compson, Sheri Hanretty

2. Youth Programs

Two YCC positions were filled again this year. Chris Christianson from Upham and Sheri Hanretty from Towner began working in June. They worked on the backlog of jobs that are put on the back burner awaiting YCC help. Most of the work they completed is listed in Section I.2.

3. Other Manpower Programs

ND Job Service sponsors a job program targeted at employing young people. The program is similar to the YCC program, but there is no cost to the sponsoring agency. We applied for two employees this year. Job Service could not find any eligible applicants, and we were unable to take advantage of the program.

4. Volunteers

This station is not located close to a major population center and volunteers are not abundant to say the least. However, each year we are fortunate to receive a lot of valuable, volunteer labor. The junior college at Bottineau has provided help for many years as part of a mutually beneficial relationship. Once again, they helped us with banding, giving us a hand when we were short of help and allowing our staff to work on other projects.

Rita Gillund did an excellent job painting part of the duplex after it was vacated. Dan Howard and Tom April spent a lot of time painting buildings, mowing spurge, and helping with nest searches on islands. All this work needed to be done but would have been difficult to complete with only our regular staff. Chris Korfmacher helped out in December filling goose tubs, working on fire plans, making easement maps and helping with extension projects.

5. Funding

A schedule of funding for the refuge and WMD over the past five years is shown in Table 1.

Table 1. Five-year funding summary, J. Clark Slayer NWR, 1988-92

Funding	FY-88	FY-89	FY-90	FY-91	FY-92
1261	332,000	245,000	241,000	243,000	238,600
1261-FLEX			3,000	4,500	9,200
1262	234,000	161,000	158,000	163,000	167,000
1262-FLEX			20,000	112,000	142,000
6860	5,000	5,000	5,000	5,000	5,000
O&M	571,000	411,000	427,000	527,500	561,800
1120			16,000	11,000	30,500
1230				15,300	
1927			10,100	12,500	15,000
8610	12,600	35,000	24,000	7,800	11,000
9120			3,400	17,600	6,800
2821	28,640				
TOTAL	612,240	446,000	480,500	591,700	625,100

6. Safety

Staff received CPR re-certification and a 6 month review during safety meetings. Grant received aviation safety training.

Gillund successfully completed the ND Hunter Safety Instructor's Course and assisted Eslinger teaching the class to 8 students. Howard assisted the Bottineau County Wildlife Club with a course in Bottineau.

Staff members were tested for Lyme disease.

7. Technical Assistance

Jacobson spent a week nest dragging CRP in the Devils Lake WMD as part of a nesting study sponsored by the HAPET office. We loaned our Truax grass to the Pierce County Soil Conservation District to seed waterways and native grass habitat plots. They plan to use the seedlings as demonstration areas and outdoor classrooms.

Upper Souris NWR borrowed our harrow to work on some seedbed preparation.

F. HABITAT MANAGEMENT

1. General

The refuge held more water than any year since 1987. It was not all where we preferred it would be but at least it was water. As the year progressed rainfall became increasingly scarce. Only the cool weather prevented grasslands from turning brown. The continued drought has adversely affected wetlands and uplands. Cattails have increased and alfalfa has been eliminated from many of the tame grass seedings.

Refuge habitat has suffered from too much rest. We have learned that this can be as detrimental as too much management. We are attempting to change this approach by using management techniques on more acres to rejuvenate habitat while also leaving enough undisturbed habitat to meet wildlife needs.

2. Wetlands

The Service's June 1985 report entitled, "Impacts of the White Spur, Stone Creek and Russell Diversion Drainage Projects on the J. Clark Salyer National Wildlife Refuge and Wetland Management District," identified the refuge's ultimate goal as management of the pools through a range of conditions which vary from Class I wetlands through Class V wetlands. The report presents some management plan options based on a 5-year drawdown cycle and recognizes that up to three years of high water may be needed to kill cattail and prepare for drawdown. While management is following the basic philosophy presented in the report, the need to hold high water on some units for several years for cattail control, drought conditions and adjustments for construction scheduling have prevented strict adherence to the model.

Total precipitation for the year was 7.68 inches below normal. Good snow conditions to the north and east of the refuge provided significant runoff from Boundary Creek, Stone Creek and Willow Creek drainages. Ice at the gates and Souris River Flood Control construction limited our ability to move water in the early spring. All pools were free of ice by April 16.

A planned release from Lake Darling to isolate nesting islands in Pool 326 was canceled when sufficient water was received from Willow Creek. A release from Lake Darling was started on March 16 to satisfy senior water rights, including 11,166 acre-feet for Eaton Irrigation District. Approximately 6,000 acre-feet of return flow from Eaton were received during May.

The precipitation deficit occurred during May through September and represented the loss of about 13,000 acre-feet to refuge marshes. Fortunately, below normal temperatures and lower evaporation rates compensated for part of the loss.

Storage peaked in May at 49,900 acre-feet, about 6,200 acre-feet above original planned storage. This is the most water in storage since 1987.

Total inflow at Bantry was 13,104 acre-feet for the calendar year or 8.3 percent of the historic annual discharge, which has averaged 157,026 acre-feet for the 54-year period from 1937 to 1991. Measured inflows at Willow Creek, Stone Creek, Deep River and Boundary Creek were 12,910; 5,695; 136; and 7,326 acre-feet, respectively. Total measured inflow to the refuge from all sites was 39,171 acre-feet.

Peak inflow at Bantry during the 1992 spring run-off period was 73 cfs on May 2. Flow at Bantry peaked again at 216 cfs on May 8 with the Eaton Irrigation release.

Total outflow measured at Westhope for 1992 was 14,849 acre-feet. Total outflow was 24,322 acre-feet less than total measured inflow. Approximately 30 cfs were passed through the main gates at 357 and low flow for four days during March to help melt ice in the construction area. About 6,075 acre-feet were released between April 17 and May 3 to lower Pool 357 for Souris River Flood Control construction. Releases dropped below the required 20 cfs minimum on 2 days during the June through October period. The total release for the period was 1,391 acre-feet above the required 6,069 acre-feet. The 357 release was terminated on November 1. A summary of Bantry and Westhope flows is given in Table 2.

Freeze-Up Levels

Water manipulations ceased in late October. All five dams were impounding water at freeze-up. Pools were completely frozen on November 14. New gates eliminated the need for ice cutting this year. Pool levels at freeze-up were:

Pool	Elevation
320	1422.70
326	1419.50
332	1416.50
341	1413.00
357	1411.50

Table 2. A summary of inflow at Bantry and outflow at Westhope, 1992.

Month	Acre-Feet Inflow Bantry	Acre-Feet Outflow Westhope
January	601	2
February	336	0
March	1,100	337
April	776	5,000
May	7,500	2,010
June	695	1,470
July	168	1,570
August	64	1,480
September	15	1,400
October	400	1,540
November	1,100	43
December	349	0
Total	13,104	14,849

Unit Operations and Observations in 1992

All five main units were impounding water during the winter. Slide gates on the Benson and Redhead subimpoundments were open to prevent ice damage. The 320 and 341 structures were isolated by coffer dams for Souris River Flood Control Project work during the winter. A 96-inch tube with stop-loss was in place at 341 as a bypass. A bypass was not installed at 320.

Early runoff from the Souris River and Willow Creek was stored in Pools 320 and 326. The lack of a bypass at the 320 construction site limited our ability to handle the water. As soon as ice conditions permitted, the stoplog structure on the west end of the dike and a new slide gate structure constructed in the center of the dike last fall were used to pass water. Water in 320 rose above target and passed over the spillway for a short period.

Table 3. Average Monthly Temperatures in °F, J. Clark Salyer NWR, 1992.

Year	May	June	July	Aug	Sept	Ave
1983	49.8	62.9	71.3	72.6	54.5	62.2
1984	52.5	62.8	68.9	61.3	50.4	60.3
1985	58.0	57.3	66.8	61.3	50.5	58.8
1986	55.8	64.8	67.4	66.2	52.9	61.5
1987	59.6	68.4	67.8	62.0	56.9	62.9
1988	59.8	74.3	69.9	67.9	54.5	65.3
1989	56.9	62.4	71.8	68.5	56.1	63.1
1990	52.9	64.2	66.4	67.8	58.1	61.9
1991	56.2	64.9	66.7	69.1	55.2	62.4
1992	57.1	62.3	61.9	62.6	53.2	59.4

Table 4. Total Annual Precipitation and Maximum Temperatures, J. Clark Salyer NWR, 1992.

Year	Days above 90F	Max. Temp.	Precip. 5/1-9/30	Precip. 1/1-12/31
1983	21	102	12.63	17.06
1984	26	102	5.55	16.98
1985	8	97	11.49	17.70
1986	12	96	8.95	15.99
1987	14	100	11.98	14.85
1988	31	105	9.50	14.06
1989	18	103	10.38	14.51
1990	11	98	13.63	17.72
1991	13	101	12.92	19.35
1992	13	100	5.22	8.93

Stone Creek and Boundary Creek provided the major source of water for Pools 332, 341 and 357 during the spring and early summer. No water, other than the Eaton Irrigation District return water, was acquired from Lake Darling because of the low condition of the lake.

Water management through bypasses around Souris River Flood Control Project construction sites proved to be a challenge and required significant time and coordination with the Corps of Engineers (COE) and the contractor.

Rubble Masonry Unit

This unit was dry through the winter, and we planned to keep it dry to facilitate replacement of a bridge near the outlet structure. Flooding from Willow Creek filled the unit during March, and it was held high by the high level of Pool 320. It was allowed to recede as quickly as possible to reduce construction problems. Evaporation reduced it to a very low level by fall. Waterfowl use of the unit was good.

320 Unit

This unit was at elevation 1423.6 through the winter and was targeted for 1423.7 for the summer. The lack of a bypass around construction and the limited capacity of the two small structures in the dam caused the pool to rise to about 1425.9 and flow over spillway for short periods on two occasions. Construction problems caused the sheet piling coffer dams to be left in place around the main structure until early September, and the main gates were not available for use. Some flow was maintained through the small structures until late summer, and levels gradually declined to a low of 1422.3 at the end of October.

A washout around the upstream sheet piling coffer occurred during the night on April 4, allowing an estimated 200 cfs flow through the construction area. The break was finally sealed off by the construction contractor in the early morning hours of April 6.

A minor oil spill occurred on September 10 when a hose broke on a hydraulic driven vibro hammer being used to remove sheet piling releasing about 15 gallons of Type F automatic transmission fluid. Cleanup was coordinated with the COE and construction contractor. Little measurable damage occurred.

A modification of the heating system on the new gates was completed before the coffer were removed. Problems with stoplog slot design and the placement of gate opening indicators are still to be resolved. The indicators strike a cross beam in their present location and will not allow the gates to be fully opened.

Refuge staff are assisting the COE with a study of the new gate heaters. The COE has installed heat sensors and time-lapse video camera equipment at the 320 structure to monitor gate operation.

Benson Subimpoundment

Much of the water released from Pool 320 was routed through this unit. The north outlet gate was used in conjunction with the new 320 outlet structure to move water into the unit. The large outlet gates along the Willow City Road were open throughout the summer and the water level was controlled by the level of Pool 326.

Freeman Bridge Unit

In 1991, a portion of the Upham-Willow City Road was modified by McHenry County. A bridge that provided an outlet to a small segment at the upper end of Pool 326 was replaced with culvert with a screw gate. The area is bounded by the Upham-Willow City Road, access trails to the Freeman Bridge fishing area and the 320 dike, and the 320 embankment. The gate allows some control over the distribution of water at the upper end of the pool. The area was flooded with water being released through the new 320 slide gate structure and coming over the 320 spillway. The shallow area received heavy use by ducks, geese and wading birds during spring and early summer. The release through the screw gate was timed to get water off wet meadow habitat in the unit by early June.

326 Unit

Since construction on this unit was essentially complete, it was targeted for high level (1423.2). Erosion along a 700-foot section of the dike during the spring prompted reduction of the target to 1421.2. Release rates were dictated by the ability to pass water around construction in the downstream units. The pool peaked at 1423.6 on June 9 and slowly receded during the rest of the year. All gates were closed on September 21 at a level of 1419.65.

After some evaluation and negotiation, the COE modified the contract to include placement of riprap on the erosion area. Work was completed during the fall.

Redhead Marsh

This unit was filled to elevation 1419.7 with water from Pool 326. The original target level was 1420.0. Filling was stopped at this level to prevent flooding of an adjacent unreclaimed borrow area. The unit was allowed to slowly lower during the summer.

332 Unit

Pool 322 was to be managed at 1418.1. Good flow from Stone Creek brought it to a peak of 1419.1. Gates were opened on April 23 to pass water from upstream units and to lower the pool so earthwork in the spillway segment could be completed. Gates were fully closed on September 4 at a pool elevation of 1416.2.

341 Unit

The 5-year water management plan used in the specifications for the Souris River Flood Control Project called for Pools 341 and 357 to be in drawdown at elevation 1409.5 during 1992. Late in the fall of 1991, the contractor for the project announced plans to place the bypass culvert for passing the required 20 cfs minimum flow to Manitoba at the site of the old stoplog structure in the center of the 357 spillway. This would require a higher pool elevation to pass the minimum flow. Instead of allowing the pool to completely dewater, the low flow gates were closed on November 1, 1991, and an elevation of about 1411 feet was maintained through the winter. This established a winter level of 1411.2 in Pool 341.

Lacking specific plan information on the 357 bypass, 1412.5 was chosen as the target operating level for both pools in the 1992 annual water management plan with the understanding modifications may be necessary after construction plans were finalized. Since water levels at the 357 structure and on the downstream side of 341 were of greater concern to the contractor, excess water from upstream pools during the spring and early summer was stored in Pool 341. The pool peaked in early July at 1417.0.

357 Unit

Runoff to Pool 357 began in early March, and the ice level rose to 1413.84 by March 23. The bypass culvert was placed in the center of the spillway at about this time. The invert elevation was approximately 1409.6 feet, and the contractor indicated a pool level of no higher than 1413.8 feet would be suitable. After the ice broke up, the pool elevation ranged from 1413.76 to 1414.26, depending on wind direction.

By March 23, ice at the Pool 357 gates had melted enough to allow gate movement. At the contractor's request, the center gate was opened to pass about 20 cfs to open up ice below the structure in preparation for construction activities scheduled to begin on about April 1. The gate was closed on March 25, and the low flow structure was opened for two days to thaw ice on the west side of the channel. Construction did not start as planned.

On April 15, the contractor changed plans again. The higher level of Pool 357 was causing problems with finish work and riprap placement on the downstream side of the 341 structure. Construction was timed to use of the low flow structure as a bypass until the new main gates were operable. The contractor requested the pool be dropped back closer to the original target. We agreed to release approximately 200 cfs after coordination with U.S. Geological Survey (USGS) and Manitoba Water Resources. The release began on April 16 and continued until May 4 when the contractor requested the gate be closed to allow construction of a coffer dam.

Flow to Manitoba between June 1 and October 31 fell below the required 20 cfs minimum on two days. A strong south wind plugged the trash rack with vegetation on September 17. The second problem occurred on October 14 after the switch from the low flow to the

new main gates. The contractor placed a tube through an earth coffer dam below the structure to facilitate the release. A construction foreman became concerned about a rise in water elevation between the structure and downstream coffer and reduced the gate opening without consulting with the project engineer or refuge staff.

Water Management Plan

Changes in area capacity tables, raising of dams 326, 332 and 341 and reduced water supply resulting from construction of dams in Saskatchewan require revision of our water management plan. Also, observation of responses of various pools to the 5-year drawdown cycle, the use of a strict 5-year cycle on all pools is in question. An extensive literature search has been done, and the revision is scheduled to be completed by September 30.

Measurement of Releases

Measurement problems were again experienced at Westhope due to high tailwater below the gage weir. A diversion in Manitoba pooled water almost to the top of the weir early in the year. Changes in the water elevation below the weir and wind action influenced gage readings. The level was lowered early in the summer, and measurement conditions improved. Changes in USGS equipment left us without remote access to gage readings for a time and complicated management. We now have access to the USGS computer in Bismarck and can also access equipment at the gage station via computer.

Flood Project Modifications

Evaluation of the gate heaters on the 326 structure during the winter showed some major deficiencies. Faces of the gates were to have a 6-foot heated zone that covered the normal winter operating levels of the individual pools. Gates were manufactured with the heated zone in the top 6 feet of all gates. In Pool 326, this placed the heaters entirely above the lower winter operating levels. Side seal heaters and heaters on the lower trunion arms were provided by the contract, but bottom seal heaters were dropped during design as being unnecessary. The lack of a source of heat at the bottom and/or the back of the gates would not allow cross members on the backs of the gates to be freed from the ice.

The COE issued a contract modification to add heating elements to the lower part of all gates, and the work was completed by September. Coffers were kept in place at 320 and 341 until the modification work could be done. Work on 326 and 332 was completed by blocking off one bay at a time with a bulkhead and using a barge on the downstream side as a work platform. The delayed removal of coffer at 320 and 341 and construction at 357 required operation through bypass structures at all three locations, greatly complicating our water management. The effectiveness of the heater systems is yet to be tested.

The method of repair of the 357 low flow structure eliminated the stilling well immediately behind the orifice gates, making one of the staff gages used to determine head differential for setting the 20 cfs release unavailable. This was not anticipated in the contract, and a monitoring device was not provided in the new well. A staff gage cannot be safely read in the deeper well. We are currently working with the COE to get a device which can be read from the top of the well included in a contract modification.

3. Forests

There are about 8,000 acres of mixed woodland on the southern end of the Refuge. Aspen and some oak are found in the Sandhills and meadows. There are stands of green ash, bur oak, and American elm along the river. Scattered tree plantings are found in old farmsteads and in the headquarters area.

Aspen expansion in the grasslands of the Sandhills has occurred since bison and wildfires were eliminated from the area. It has greatly increased since the refuge was established. Areas that were once part of sharptailed grouse census blocks are now part of ruffed grouse drumming routes. Plans are being developed to reverse the trend and restore the native grasslands by using prescribed fire, grazing, and mechanical removal. This will take many years to accomplish but the present condition did not occur overnight. It is only reasonable to expect recovery to take time also.

Regional Fire Management Coordinator Troester, Fire Management Officer Granger from CMR, and Fire Ecologist Blair inspected part of the Sandhills in August to develop recommendations for prescribed fire. Fall burning will be used to reduce the aspen stands and restore the area to grassland.

Woodcutting is allowed by permit with permittees paying a \$10.00 fee to cut two cords of wood. Six wood cutting permits were issued in 1992. Most cutting is done close to established refuge trails. Permittees were allowed access to wooded areas by following trails made by farmers moving hay from the hay meadows. This allows woodcutting to be spread over a larger area.

Much of the woodlands on the refuge are dominated by large trees with little or no understory. Dead wood is common in much of the forested land. By allowing permittees to cut dead and down wood, some areas will be opened, allowing an understory to develop. This will make more areas suitable to a wider range of wildlife species.

There is no charge for clear cutting aspen. There is also little interest in this option.

4. Croplands

Farming was done by seven cooperators, preparing seedbeds for grass seeding, controlling noxious weeds, and supplying grain for duck banding. Resident wildlife also benefit from the winter food supply our fields provide.

Crops are divided into shares, 70% for the cooperators and the remainder harvested, left standing, or baled for feed bales. The harvested grain is delivered to the elevator in Kramer making it easy for us get grain for baiting banding sites.

Sweet clover was seeded with a small grain nurse crop as part of the rotation on several units again this year. Results were mixed on the 231 acres seeded. Some fields had a decent catch, others were total failures most likely because the widely scattered rain showers missed the field.

Some of the farmers like the sweet clover, others are not sold on it because it uses so much moisture. That is a major concern when you've been through several consecutive droughts.

More acres were fallowed this year to try to get weeds and quackgrass under control. The problem was so bad, the tillage did not do a decent job.

Yields were nothing special this year. The continuing drought and the increasing competition from perennial weeds reduced yields. Yields were better on the northern units, because they received more rain and have less weed competition.

The Service's efforts to reduce chemical use is contributing to yield reductions on refuge cropland. Crop yields on our land do not compare well with neighboring private land. Weed control, especially quackgrass, is essential for normal yields and to prepare seedbeds for seeding grass. Tillage is very risky in these soils because it removes the stubble residue, exposing the soil to wind erosion most years. The tillage necessary to kill the persistent weeds is too risky, and SCS no longer allows black fallow on conservation plans. Crop residue management is essential for controlling soil erosion. The Service should not use practices on refuge lands that cause soil erosion. We will need to begin a reasonable program of at least some chemical use if we are to use farming to re-establish nesting cover and continue a banding program.

Some chemical was used to control broadleaf weeds, including leafy spurge, which tend to be problems in dry years. Fifty-four percent (518 acres) of the cropland was sprayed with 2-4 D at rates varying from ½ pint per acre to 1 quart per acre. Average spray rate was 0.67 quarts per acre.

Table 5. Crops planted and average yield for 1992.

Crop	Acres	Avg. Yield/Acre	Refuge Share
Barley	450	23.55 bushels	4373 bushels
Wheat	144	16.2 bushels	506 bushels
Oats	69	50 bushels	Crop failure-30% left standing
Corn	76	1 tons-silage	14.0 acres
Sudan Grass	14	0.25 tons-silage	None
Flax	45	5 bushels	42 bushels
Fallow	246	NA	NA
Total	1044	-	

5. Grasslands

Grassland conditions were surprisingly good in spite of very little rainfall. Cool temperatures kept the grass from "burning up", but there was very little regrowth on grazed or hayed areas. Many tame grass seedings have been damaged by several droughts. DNC in particular has suffered as alfalfa has died from dry conditions or winterkilled from lack of snow cover.

DNC was interseeded on 100 acres of a failed 1989 seeding. The area was burned May 4 to remove litter and seeded within a couple days. The fire stimulated an excellent response from what appeared to be a failed planting. Good densities of alfalfa and sweet clover were present by late June. This cover was not from the interseeding but most likely from plants present but suppressed. The lesson here is, "Do not give up on grass seedings too quickly."

7. Grazing

A new four year lottery was held this year, dividing 47 grazing units among 10 permittees. Each grazing unit was evaluated to prepare for the lottery, mapping range sites and calculating the acreage of each for over 8,600 acres of grassland. This information helped us develop rotations and stocking rates. Sixteen new units were added to the lottery. More temporary cross fencing was used in all units and special emphasis was placed on shoreline cattail control in several units.

Some of the grazing units lend themselves quite easily to cattail control. The units are long and narrow, making it easy to divide with electric fence. The cattle did well on the cattails, and the permittees were happy to get the extra grazing. The cattle opened shoreline and dense cattail stands which should produce plenty of shallow water areas next spring. There was plenty of cattail left for over-water nesters.

The grazing rate survey completed in 1991 lowered the Service's grazing fee to \$9.40/AUM, comparable to area rates. Our method of calculating AUMs differs from everyone else, including SCS, who considers a cow- calf pair as one AUM. The extra 0.25 AUM we charge for a calf pushes our grazing rate up quickly. We are approaching a point where our fees are becoming prohibitive for some ranchers. We have been unable to find permittees for Service land in some areas with other private pasture available. Our rates must also be competitive in years with good grassland conditions, so ranchers are not tempted to get by without extra pasture.

8. Haying

Haying is used to control woody invasion in the river meadows and, to a lesser extent, improve tame grass nesting cover. Willow invasion can happen quickly if the meadows are not hayed or if the cooperator does a poor job. Cattails and weeds have increased the past several years because the meadows have not been flooded as they normally would be.

A new, four year lottery was held this year. All haying units were evaluated and some changes were made for the new lottery. Seven new units were added and five were expanded for the new lottery. There are now 31 units covering about 3200 acres, all in McHenry County. Increased emphasis was placed on mowing willows, cattails, and weeds this year.

Permittees hayed 1,535 acres in the regular hay units. Yields were lower than normal at less than a ton per acre. Only 1,130 tons were cut for which the permittees paid \$6788.69.

Twenty special use permits for 816 acres for additional haying for weed control, tame grass management, and opening shallow water areas were issued.

9. Fire Management

Three prescribed burns covering 292 acres of grasslands were done in May. The first was a 247-acre burn on May 4 targeting an unsuccessful, 100-acre 1989 DNC seeding. The field had enough DNC to make it worth keeping but was a very poor stand. There was very little competition from undesirable grasses, so we burned it to remove the litter and interseeded DNC to improve the stand. By late June, it appeared the interseeding was unnecessary because an excellent DND stand emerged.

The other burns were warm season native seedlings heavily infested with leafy spurge. The 18-acre field at Deep River was done May 26, and the 27-acre 320 cemetery field was burned on May 29. The leafy spurge was growing well in both fields but burned completely. The Deep River field was grazed by angora goats, preventing leafy spurge seed production. The 320 cemetery field was sprayed with 2,4-D in late August before seeds were produced. Fire can certainly be used to supplement weed control efforts in some cases.

A 2,000-acre prescribed fire was completed in the Sandhills Tower tract on September 2 and 3. Personnel from Des Lacs NWR, Lostwood NWR, Lostwood WMD, Audubon NWR, and Upper NWR helped with the fire. RFMC Troester, FMO Granger from CMR, and Regional Fire Ecologist Blair from Brookings, SD prepared the plan and were in charge of the fire. Lee Hotchkiss, regional pilot provided air support for video taping and observation. A helicopter from Brainerd, MN was hired to help with ignition via helitorch. A U.S. Forest Service crew from near Rapid City, SD served as the helicopter ground crew and mixed the alumagel ignition fuel.

Weather conditions on the day of the burn were within prescription, but winds were gusty. A brisk wind was needed to push fire into the aspen stands. The fire was going well until the helicopter accidentally dumped ignition fuel into a burning aspen clone. The trees literally exploded, creating a crown fire and burning cinders were blown across the blackline and road into grassland. By the time the wildfire was contained, an additional 591 acres of aspen/grassland were burned. The wildfire was contained within the refuge boundary, and nothing was burned that didn't need a burn anyway.

The prescribed fire was completed the next day with marginally acceptable conditions. Winds were light which prevented good fuel consumption, especially along firebreak boundaries. Fire did not carry into aspen clones very well which probably did not hurt the trees at all.

In spite of the escaped fire, the burn was successful. Far more was learned from the escape than was learned from the prescribed fire. Burning the aspen/grassland habitat found in the sandhills area of this refuge will require conditions on the upper limits of a fire prescription, a prescription that would not be acceptable for grassland alone. We found burning under conditions acceptable for grassland fires was not effective in a wooded area. Burning under those conditions did not accomplish the objectives and left unburned fuels near firebreaks, a potential hazard for many days after the fire.

The burn was also a good example of sharing Service resources to accomplish a good resource project. It also demonstrated that Service personnel with burning experience, training, and proper equipment are very capable of dealing with wildfires under extreme conditions.

More prescribed fire is planned for the sandhills. It is the only practical way to gain control of the aspen invasion reverse its expansion, and restore the grasslands that once existed. It took over fifty years to get in the shape its in so it will not change over night. We are in this for the long haul.

There was only one wildfire reported this year. A small fire in the Highway 14 right-of-way was reported to the local fire department by a passing motorist. They extinguished the fire after it had burned about one acre within the right-of-way.

Grant and Compson completed S-130 and S-190 training at NPWRC. Grant also completed S-390 training in Bismarck.

10. Pest Control

Leafy spurge is worse than ever. The weed appears to be more competitive than grass in dry weather and a few years reduced chemical treatments has allowed it to spread dramatically. A local county weed control officer also has attributed some of the spread to haying marginal areas. The drought has forced many ranchers to hay areas that are likely weed infested and normally left alone. Moving the hay, illegal but a real world reality, has probably produced new infestations.

Goat grazing was done again, this time with a different herder, using some of the things learned last year. The goats worked well, concentrating on spurge in shorter cover and in areas recently grazed or burned. The goats were herded to leafy spurge by a man on horseback during the day and penned with a guard dog at night. The herder was hired by the goat owners.

About 270 acres of leafy spurge in about 700 acres of grassland were controlled. This method can be effective for large scale control on areas where fencing would be impractical or too expensive. Using goats for spurge control is market dependent however. If the prices are good, some people will own large numbers of goats. If prices are low, the goats will be gone. The Service must recognize this and be prepared to help make goat ownership profitable if we want to use them for non-chemical weed control. We must also understand chemical control may be cheaper in terms of dollars than non-chemical control and not assume a switch in control methods will save money. The flea beetles release site was checked several times by APHIS personnel. Unfortunately, no beetles were found. APHIS personnel believed the site was ideal and expected a good catch. The unusually cool summer may be responsible for the lack of success locating the beetles. The same thing occurred on well established release sites in Canada. We have not given up on the insects yet and plan to establish more release sites as the beetles become available. Biological control may be the only reliable, long-term solution to the spurge problem, but it will take a long time to have a significant impact on infestations as large as ours.

Table 6. Noxious Weed Control, 1992.

Method	Target Weed	Acres Treated	Cost per Acre	Success
Chemical	Leafy Spurge	897	11.88	Good
			NA	Poor
Goats	Leafy Spurge	270	NA	Good
Mow	Leafy Spurge	20	35.00	Fair
	Canada Thistle	20		
Flea Beetles	Leafy Spurge	NA		Unknown

The reduced acreage and active ingredient recently does not mean there is less leafy spurge. We chose not to spray much of the acreage in 1990-91, concentrating only on boundaries, highly visible areas, and complaints. The way the spurge has spread, it does not appear this was the right strategy. This year, we sprayed every day conditions would allow and did not come close to treating all the areas with spurge before it set seed. Huge areas along Pool 357 went to seed before we could get to it. The weed is quickly becoming out of control.

Purple loosestrife has been found in Minot, ND about 55 miles from the refuge. The Souris River, our main water source, flows through Minot. In 1991, a couple miles of the Souris River east of Velva was searched by canoe for purple loosestrife. No loosestrife was found but we will have to occasionally monitor the river and respond if and when loosestrife is found. We have contacted county weed control officials and will push them to make a strong effort at eradicating the plant if it is located in Minot.

G. WILDLIFE

1. Wildlife Diversity

The refuge is located in an area where the ranges of eastern and western species overlap, increasing the wildlife diversity found here. Deer, pheasant, partridge, rabbit, grouse, many species of passerine birds, rodents and waterfowl are found on and around the refuge.

2. Endangered and/or Threatened Species

Bald eagles are regular visitors in small numbers. They follow the spring and fall waterfowl migrations and can be seen regularly around the marshes.

One immature bald eagle was sent to the Raptor Center in Minneapolis, MN on November 13. The bird was released at Fort Snelling State Park in Minnesota on January 20, 1992. It is banded with band number 629-33999.

Other endangered or threatened species that may be found in North Dakota are listed below. There were no sightings of these species in 1992.

Endangered species: Black-footed ferret, American peregrine falcon, eskimo curlew, least tern, whooping crane, and gray wolf.

Threatened species: Piping plover and arctic peregrine falcon.

3. Waterfowl

Better snowfall in the 1991-92 winter provided sufficient water for brood rearing and fall migration. About 200,000 ducks were present on the refuge at the end of September, and numbers remained good through the fall. Nesting island and predator exclosure studies continued (See Section D.5.).

The first Canada geese returned to the refuge on February 28. The first snow geese of the fall migration were seen on September 7, and over 40,000 were present at the end of September. Numbers continued to build through most of October, peaking at about 175,000. Only about 5 to 6 percent of the snow geese were young birds.

4. Marsh and Water Birds

Eared grebes are the most abundant marsh and waterbird on the refuge. The breeding population is an estimated 20,000 birds. Black-crowned night herons, cattle egrets, and white-faced ibis, pied-billed grebes, and American coots also raise their young on the refuge. White pelicans are common in the summer months, feeding at the refuge. A nesting colony of pelicans is found on Willow Lake Easement Refuge located 30 miles northeast.

5. Shorebirds, Gulls, Terns, Allies

Many species of shorebirds use the refuge for feeding and nesting. Franklins gulls, ring-billed gulls, common, black and Foresters' terns are present on the refuge. Willets, yellow-legs, sandpipers, godwits and avocets among other shorebird species are also seen throughout the year.

7. Other Migratory Birds

Eslinger and Chris Korfmacher (volunteer) completed the annual Christmas Bird Count. Fourteen species and 102 individuals were counted.

10. Other Resident Wildlife

There are many species of resident birds in and around the refuge. The main game bird species are sharp-tailed grouse, ring-necked pheasant, grey partridge, wild turkey and ruffed grouse. Censuses are done each year to determine grouse and pheasant populations. Informal counts done during routine work are done on wild turkey and grey partridge.

Wild turkeys have been on the refuge since introduced in 1979. The turkey population is doing very well in the wooded river bottoms and the sandhill areas. We seem to see a general expansion of the turkeys to private land near the refuge. These areas have more cropland and hayland interspersed, perhaps offering more reliable food sources for the turkeys.

Porcupine, coyote, red fox, squirrels, cottontail rabbit, white-tailed jackrabbit, snowshoe hare, Franklin's ground squirrels, thirteen-lined ground squirrels, weasel, and many other small mammals are common to the refuge. Moose are becoming more common, and we believe a breeding population now exists on the refuge.

There is no official census of grey partridge on the refuge. Populations have always been low since there is not much preferred habitat on the refuge.

11. Fisheries Resources

Northern pike, walleye, yellow perch, and bullheads are the primary fish on the refuge. The refuge has thirteen public fishing areas. Some success was reported at the 320 fishing area and a few of the fishing areas north of refuge headquarters. The drought has essentially eliminated the marginal fishery that once existed here.

15. Animal Control

During banding operations, barley spread on the banding sites. This helps prevent waterfowl depredations on nearby croplands. Other animal control is discussed under trapping and under waterfowl-nesting islands sections.

16. Marking and Banding

Another hectic, labor intensive preseason duck banding operation resulted in a record 7,283 ducks being banded. We were able to shoot the rocket nets on 18 mornings, a few

more than usual. Volunteer labor amounted to 881 hours, mostly from North Dakota State University – Bottineau. Tewaukon and Audubon NWRs also sent help.

H. PUBLIC USE

1. General

Many people use the refuge for outdoor education. The prairie, grassland management, water management, waterfowl, law enforcement, hunter safety, and hunting prospects are some topics covered during the year. Picnicking and birdwatching are also significant uses.

Three journalists from England, Belgium and France escorted by Tracy Poter of the ND Department of Tourism visited the refuge in October. The sight of clouds of snow geese amazed them all.

2. Outdoor Classrooms – Students

The ND Wildlife Federation Youth Camp participants spent most of a day on the refuge. Lessons on wetlands, uplands, and predator management were given to 24 students and 4 counselors. The Bottineau County Wildlife Club supplied lunch for the group, hosting a BBQ at Thompson Well.

Fourteen students and 3 adults from Minot Central Campus spent a Saturday with Erickson working and wetland and grassland activities. KMOT television came along to film portions of the outing.

4. Interpretive Foot Trails

The refuge has two foot trails for public use. A short 0.1-mile trail leads from headquarters through a switchgrass seeding to a platform overlooking the Pool 326 marsh. The Sandhills Walk area is an access point to the sandhills, giving visitors the chance to explore some 8,000 acres of mixed bur oak, aspen and grassland community on the south end of the refuge.

A Sunday morning nature tour was given to the local chapter of the Sierra Club. This is the same group that has been pushing for “low impact camping” on refuges.

5. Interpretive Auto Routes

The refuge has two auto tour routes. A 5-mile Grassland Trail that parallels a portion of Pool 341 offers visitors an opportunity to see grassland and wetland wildlife and scenery. This trail has 7 stops and an interpretive pamphlet which explain the history, features and management of the area. Many birdwatchers go to this area to see Baird's sparrow and chestnut collared longspur.

The second auto tour route starts at headquarters and goes for 22 miles through the marshlands and wooded river bottoms near Pools 326, 320, and the sandhills on the southern end of the refuge. This route gives refuge visitors a chance to see the diversity of habitat found on the refuge and provides information at 18 interpretive sites along the trail.

6. Interpretive Exhibits/Demonstrations

Several staff members served as judges at area science fairs: Grant and Gillund in Belcourt; Erickson and Gillund in Newburg; and Eslinger at the regional fair in Minot.

Refuge staff helped at a Fish and Wildlife Service booth at the state fair in Minot. This provided an opportunity for people to get information on wildlife extension programs, refuges and the Fish and Wildlife Service.

The refuge sponsored "Pierre Bottineau" at the Maxbass, Newburg, Upham, and Willow City Schools using wetland education funds. The "Home for Pearl" tape was loaned the Bottineau Schools. National Wildlife Week programs were given to Newburg United and Upham elementary schools.

Erickson and Howard participated in Law Day in Minot with Sandra Sieckanec for Upper Souris NWR. Our new airboat was displayed and drew lots of attention.

7. Other Interpretive Programs

Refuge programs were given to the Upham Senior Citizens (12 plus 2 legislative candidates), a district church group of 10 pastors and a church group from Westhope (20).

8. Hunting

Most waterfowl hunting is done off the refuge on private land. Decoying the large flocks of snow geese that come off the refuge attracts hunters from all over the country. There are nine public hunting areas on the refuge that are open for waterfowl hunting. Most hunters using these areas prefer pass shooting geese as they leave the refuge.

There were about 40,000 snow geese on the refuge for the waterfowl opener. The goose population peaked at about 175,000. There were very few young birds, only 5-6% of the population, which made decoying difficult. Hunter success was usually poor because the adult birds did not decoy, even in poor weather. The season ended gradually as snow and cold weather moved birds south. By the first week in November, most snow geese were gone. A few Canada geese stayed until the end of the season, November 15 but eventually all water froze and the birds moved.

Several retrieval zones along the refuge boundary were eliminated. These zones had been established many years ago along some traditional pass shooting areas. Most of the

adjacent private land is now closed to hunting, and, since the retrieval zones were not along section lines, they were essentially private retrieval zones. Most received very little use anyway, and we hope eliminating the retrieval zones will discourage fenceline hunting and the skybusting that so often goes with that type of hunting.

Upland game hunting for grouse, partridge, and pheasants is allowed on the Public Hunting Areas. Grouse, partridge, and turkey hunting is also allowed south of the Upham-Willow City Road.

Grouse hunters usually hunt the refuge during the first couple weekends of the season but there is little activity after waterfowl season starts. Ruffed grouse hunting pressure has generally been very light and with the low population this year, pressure was even less.

Two turkey seasons are held in the state unit which includes the refuge. The spring season is gobblers only. Very few people hunted on the refuge during the fall season.

Four hundred fifty refuge deer hunting permits were available through the ND Game & Fish Department lottery this year. Only 415 refuge permits were issued as the NDG&F ran out of licenses for this subunit before all refuge permits were issued. Refuge permit holders could hunt on or off the refuge this season. A questionnaire was sent to all 415 permit holders after the season, 67% responded (See table #7). Harvest numbers were extrapolated from the responses.

Opinions on deer population were just as mixed as past years. Eighty-seven respondents said they thought the population increased, 20 thought it decreased, 59 thought it stayed the same, and 88 had no opinion.

Of 254 permit holders that responded, 47 (18%) did not hunt on the refuge this season. Only 59% harvested deer on the refuge. Twenty percent harvested deer off the refuge, but they did spend time hunting on the refuge. Success rate for those that hunted the refuge was 79%. Percent success was not calculated by section due to the overlap of hunters that reported hunting in more than one area.

Based on the questionnaire, if the refuge permittees had been required to hunt only on the refuge, 62 more deer would have been harvested.

Table 7. 1992 refuge deer season results.

	Number	Number Successful	Percent Use
South of Upham-Willow City Road	145	86	56
North of Upham-Willow City Road to Russel-Kramer Road	57	33	22
Russell-Kramer Road to Highway 5	30	17	12
North of Highway 5	26	15	10

We still have complaints from hunters who want more hunters in the refuge to "move the deer". These people like to drive their vehicles along public trails and let someone else do the work. Their version of hunting resembles something more like herding and certainly is not a quality hunt. Many hunters like the present system with fewer hunters, creating a quality hunt not found elsewhere.

Howard completed a series of hunting reports which aired twice daily for four days a week during the hunting season on KBTO Radio in Bottineau.

9. Fishing

Fishing on the refuge is marginal at best. This year was very poor. The drought has severely reduced fish populations since 1889. The area around the 326 water control structure was closed because of dike construction work.

The Gillunds and Jacobs assisted at the Disabled Fishing Day at Upper Souris NWR.

10. Trapping

Trapping is a management technique used to remove surplus furbearers. Fur prices remained low and only two trappers expressed any interest in trapping. Only one trapped but he did very well trapping from Highway 14 north to the Canadian border.

11. Wildlife Observation

Many visitors enjoy non-consumptive use of the refuge each year. Most of the visits are to see the fall and spring bird migrations. Numbers of visits are not recorded. Many visits are on the weekends and many visitors do not stop at refuge headquarters.

14. Picnicking

Picnickers use the Thompson well site, the Sandhills tower picnic area, the headquarters tower picnic area and some of the public fishing areas. No effort is made to record the number of visits.

Accessible picnic tables were placed at picnic sites.

17. Law Enforcement

Most of our enforcement work occurs during the waterfowl season. Dry conditions in the WMD has reduced waterfowl and hunter numbers drastically the past few years. Wetland conditions were better in the eastern part of the WMD this year but the hunting pressure was still quite low. The refuge still attracts large numbers of waterfowl and hunters. The deer season is also a busy time.

Violations discovered by refuge officers were as follows:

- (2) Early shooting ducks
- (1) Unplugged shotgun
- (2) Vehicle trespass on a WPA
- (1) Violation of State law- no state stamps
- (2) Violation of special access regulations-carrying a firearm without a deer license on the refuge

Several violations were turned over to NDG&F Department wardens for prosecution. They include:

- (1) Improper clothing while hunting deer-State regulation
- (1) Failure to produce a deer license
- (1) No State stamp- deer license

Gillund met with SRA Kraft and the U.S. magistrate concerning a violation he had written during the 1991 deer season. The hunter had violated the State's fluorescent clothing requirements and was hunting on the refuge. The hunter told the magistrate he had no problem with the officer but did not agree with the law. The magistrate made it clear disagreements with the law were not subjects for discussion in his court.

Refuge officers attended the annual refresher at Marana, AZ. Howard and Erickson staffed the Law Day display along with staff from Upper Souris NWR.

Eslinger picked up confiscated fish parts from the Border Patrol Agent at the Westhope Port of Entry. It was a no species identification violation.

The Peace Garden Peace Officers Association held the annual meeting at refuge headquarters on September 16. Erickson discussed wildlife law enforcement with officers from the 7-county area.

I. EQUIPMENT AND FACILITIES

1. New Construction

A new security fence was installed force account in the equipment storage area. This was an MMS project done with considerable savings compared to a contracted job.

The bridge at Dam II was replaced with a pre-fabricated, concrete structure. The bid for the project was higher than what was estimated, but the savings we made with completing the other two MMS projects force account enabled us to pay for the extra cost.

A covered entry to the duplex's outdoor basement entrance was built. This should help keep water out of the basement.

2. Rehabilitation

The 504 and accessibility evaluation was completed. Now we need the funding to fix the problems. The large water control structure on the Redhead unit was riprapped. Reshaping and graveling was completed on 2.25 miles of the 320 patrol road. Blow-in insulation was added to the duplex and the WMD manager's residence. Asbestos containing shingles were removed from the duplex and asphalt shingles were installed.

The MMS project on the barn was completed. Cedar siding, two entry ways, paneling, ceilings, electric baseboard heaters for each bedroom and linoleum were added.

3. Major Maintenance

Riprap was added to the large water control structure on the Redhead unit.

YCC employees and volunteers painted the duplex garage, 3 stall, 6 stall, two boat houses, well house, shop, quarters 40 garage, banding/trapping shed, and many refuge entrance signs

Several stretches of old fence were removed.

4. Equipment Utilization and Replacement

We traded a 4x4 Dodge pickup to Valley City WMD for a 4x2 Chevy diesel pickup. They needed a 4x4. We had plenty and really needed a more economical vehicle, so the trade helped everyone. A new S-10 Blazer was purchased with MMS funds.

Six steel grain bins were sold by small lot sale and removed.

We continued to screen equipment at the Minot Air Force Base and were able to get a JD 646C payloader, Case backhoe, 22-ton equipment trailer, and a 5,000-gallon fuel tanker we plan to use as a water supply truck for prescribed burning and spraying.

The old fire tower at the headquarters was removed and relocated at the Pioneer Village in Rugby.

5. Communications Systems

We switched long distance telephone providers, saving between 30 and 60 percent on our long distance phone bills.

6. Computer Systems

Both laptops were on the blink and needed repairs. One had a bad disk drive controller and the main mother board was replaced to the tune of \$635. The other had a power supply problem. A new 486 computer was added to the fleet.

7. Energy Conservation

Blow-in insulation was added to the duplex and the WMD manager's residence.

J. OTHER ITEMS

3. Items of Interest

WMD Manager Gillund got married February 14. Dave says it is no coincidence that date was chosen because he felt he would need a reminder of his anniversary. Jacobson also got married. This one was in June, so he is on his own as far as reminders are concerned.