**CRESCENT LAKE/NORTH PLATTE**
**NATIONAL WILDLIFE REFUGE COMPLEX**

Scottsbluff, Nebraska

CRESCENT LAKE NATIONAL WILDLIFE REFUGE
Ellsworth, Nebraska

NORTH PLATTE NATIONAL WILDLIFE REFUGE
Minatare, Nebraska

WASHINGTON OFFICE

ANNUAL NARRATIVE REPORT

Calendar Year 1996

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

REVIEW AND APPROVALS

CRESCENT LAKE/NORTH PLATTE NATIONAL WILDLIFE REFUGE COMPLEX

Scottsbluff, Nebraska

ANNUAL NARRATIVE REPORT

Calendar Year 1996

Brad W. McKinney — Project Leader — 4/97 — Date

R Nagel — ~~Acting~~ Associate Manager — 7-10-97 — Date

Joe Webster — Regional Office Approval — 8/12/97 — Date

COMPLEX

# INTRODUCTION

Crescent Lake and North Platte National Wildlife Refuges have been a complex since the creation of Crescent Lake Refuge in 1931. For most of the Complex history, the emphasis was concentrated at Crescent Lake while the North Platte Refuge was considered "other duty as assigned". In 1985 an agreement with the Bureau of Reclamation (Bureau) was implemented replacing the Bureau with the Service as the primary jurisdiction agency. With this, the North Platte NWR began demanding ever increasing amounts of funding and staff power. It seemed the more involved the Service became at North Platte NWR, the more problems and opportunities were discovered, demanding more involvement. In 1992, the decision was made to establish a Complex Office nearer to the North Platte NWR which by this time was demanding more time of the Project Leader than Crescent Lake NWR. The move also solved another major problem: recruiting for the Project Leader and Office Assistant position. Historically, it has been difficult to fill vacancies in these positions due to the isolation of Crescent Lake NWR, especially for families with children.

In July of 1992, Morrill, Nebraska was chosen as the site for the Complex Office because of community assets as well as the availability of donated office space. But in October of 1993 the building owner sold the building forcing a move to a new office. The new office is located in Scottsbluff, Nebraska.

## A. HIGHLIGHTS

After two years of working on divesting part of Lake Minatare the President signed Public Law 104-212 divesting of approximately 2,470 acres. (C.3.)

The Complex was involved in two migratory bird die offs this year. An avian cholera outbreak occurred near Scottsbluff and a botulism outbreak occurred near Crescent Lake. (See individual Refuge reports)

Congress and the President had most employees on furlough from January 1 to 8, a carry over from a furlough started in December 1995. (See Funding)

## C. LAND ACQUISITION

### 1. Fee Title

In October, 16 acres, called the Bigsby Tract, were purchased from The Nature Conservancy. This acreage was adjacent to and added to the Winters Creek Lake Unit of the North Platte NWR (North Platte). This area was within the approved acquisition boundary for the Winters Creek Lake Unit.

### 3. Other

On October 1 the President signed Public Law 104-212 which divested approximately 2,470 acres of the North Platte's Lake Minatare Unit. The 2,470 acres consisted of the surface of the lake and 320 acres of uplands, all within the Lake Minatare State Recreation Area. The North Platte retained 617 acres of good wildlife habitat. Through a Memorandum of Understanding, the Bureau of Reclamation (Bureau) will continue to enforce the historical closure of October 1 to January 15, the time of peak waterfowl migration. The Lake Minatare Unit was part of the Compatibility Lawsuit by the National Audubon Society, et al. Due to the complex problems of compatibility at this Unit, the Fish and Wildlife Service (Service) was given additional time to solve the problems in the out of court settlement.

An Environmental Assessment was done with the Preferred Alternative being Divest of Some Portions of the Unit to Eliminate Low Wildlife Value Areas and Compatibility Problems. The compatibility problems were taking place through a lease issued to the Nebraska Game and Parks Commission (Commission) to manage public recreation on the Unit. This lease was issued by the Bureau in 1964 creating the Lake Minatare State Recreation Area before the North Platte took over the public use activities on the Unit and thus inheriting the problem of compatibility.

In 1994 the Bureau of Land Management (BLM) put up for excess several tracts of public land in Western Nebraska. A total of 146.27 acres were applied for in northeastern Morrill County. At the end of the year nothing has happened on the transfer of these acres.

## D. PLANNING

### 2. Management Plan

The Grassland Management Plan and an EA were completed and sent to the RO for their review and approval in 1995. It was returned in March 1996 with comments for rewriting. A final plan was returned to the Regional Office in November for their approval. Received Regional Office approval in December 1996.

A Management Plan for North Platte was drafted and is to be made part of the MOU with the Bureau that when ratified, will transfer to the Service land management responsibilities of 235 acres adjoining North Platte.

Integrated Pest Management Plan, the Annual Water Management Plan, Nebraska Tier Two Emergency and Hazardous Chemical Inventory and Plan, and Hazardous Communication Plan were completed.

## E. ADMINISTRATION

### 1. Personnel

Refuge Manager Brad McKinney (North Platte) was promoted to GS-11 on 6/23.

The Complex gained back the position it lost in 1995 through a TAPER position. On August 18 Marlin French was converted to the TAPER appointment WG-1.

In November, Police Officer Felix Koenig was converted to a Biological Technician.

Monte Shaul, Heavy Mobile Equipment Repairer, was presented with a cash On-the-Spot Award for an outstanding job serving as engineer and crew master in the construction of the Black WEA water-control structure.

The Complex has five permanent full time positions, one full time TAPER position and one permanent intermittent position.

The Complex office is staffed by the Project Leader and Administrative Support Assistant. Crescent Lake NWR (Crescent Lake) is staffed with a Refuge Manager, Heavy Mobile Equipment Repairer, and a Laborer, while North Platte is staffed with a Refuge Manager and an intermittent Biological Technician.

Temporary summer positions were:

Range Technician Marlin French EOD on 3/18 and converted to a TAPER position 8/18.
Range Technician Mike Happold EOD on 4/8 and terminated on 11/15.
Range Technician Scott Stopak EOD on 5/13 and terminated on 11/15.
Range Technician Shanna Flinsbaugh EOD on 5/21 and terminated on 8/17.
Social Services Assistant James Sarchet (Mike) EOD 5/31 and terminated on 8/16.

Figure 1. Back Row (l to r) French, Stopak, Koenig, Happold, Shaul, McKinney. Front Row (l to r) Patrick, Malone, Behrends, Flinsbaugh 96CPX1-BWM

PERSONNEL

| | | |
|---|---|---|
| 1. | Larry K. Malone, CRL/NPL, Complex Project Leader . . . . | GS-12, PFT |
| 2. | Lydia M. Patrick, Administrative Support Assistant . . . | GS-06, PFT |
| 3. | William D. Behrends, Refuge Manager (CRL) . . . . . | GS-11, PFT |
| 4. | Bradley W. McKinney, Refuge Manager (NPL) . . . . . | GS-11, PFT |
| 5. | Monte L. Shaul, Heavy Mobile Equipment Repairer (CRL) . . | WG-09, PFT |
| 6. | Fleix V. Koenig, Biological Technician (NPL) . . . . . | GS-05, PPT |
| 7. | Marlin G. French, Laborer I (CRL) . . . . . | WG-01, TFT |
| 8. | Mike T. Happold, Range Technician (NPL) . . . . . | GS-05, TFT |
| 9. | Shanna M. Flinsbaugh, Range Technician (CRL) . . . . . | GS-05, TFT |
| 10. | Scott R. Stopak, Range Technician (CRL) . . . . . | GS-05, TFT |
| 11. | James M Sarchet, Social Service Assistant (NPL) . . . . | GS-06, TFT |

Table 1 shows the staffing pattern for Crescent Lake/North Platte NWR Complex for the past five years.

Table 1. Historical Staffing Patterns

| Fiscal Year | PFT | PPT | TFT |
|---|---|---|---|
| 1992 | 6 | | 7 |
| 1993 | 6* | .3 | 2.9** |
| 1994 | 6 | .3 | 1.9 |
| 1995 | 5 | .3 | 2.14 |
| 1996 | 6 | .3 | 1.8 |

*Project Leader position vacant most of the year
**Recorded in FTE

2. Youth Programs

The Complex has a very progressive YCC program through the North Platte Refuge. This past year we had seven enrollees, four sponsored by YCC funds, one by station funds, one by Scotts Bluff National Monument (National Park Service) funds, and one by Bureau of Reclamation funds. A YCC team leader is funded partly out of YCC funds and partly out of station funds. We are currently working on getting the City of Scottsbluff to fund a position.

Projects not only include Refuge projects, but projects for the National Monument and community projects with the Commission, Riverside Zoo, and the City of Scottsbluff.

For additional information see the North Platte section.

4. Volunteer Programs

The Complex Volunteer Program provided 730 hours of volunteer services in 1996 compared to 619 hours in 1995. See Crescent Lake and North Platte sections for their volunteer programs. Carolyn Malone provided administration assistance, maintenance assistance and wildlife survey assistance for the Complex.

Volunteer Lucy Koenig was presented with a length of service pin and certificate for her ten years of volunteer work.

5. Funding

Returned from furlough on Jan. 8, 1996, this was the second Federal furlough experience for FY96. We went through 11(?) continuing resolutions before Congress passed a budget which the President would sign. The Budget for the Fish and Wildlife Service (Service) was finally signed by the President in April.

No final FY96 budget was ever issued to this field station, only two preliminary budgets which were not the same making it difficult to manage them. By the end of 1996 we have not received a FY97 budget even though the Congress passed the budget and the President signed it before October 1.

The reason no budgets came to the field for FY96 and none yet for FY97, I believe, is the fact the Service takes four months or longer after the President signs a budget bill to get their act together and get individual budgets to the field stations.

A Challenge Grant for $2,500 was received for use in a 3-day summer "science camp" provided by the Scottsbluff Public Schools Foundation. One entire day of the "science camp" was spent on North Platte.

Table 2 shows funding levels for the Complex for the past six years.

Table 2. Funding Levels

| | FY91 | FY92 | FY93 | FY94 | FY95 | FY96 |
|---|---|---|---|---|---|---|
| 1121 | 5,000 | 5,000 | 4,000 | 4,000 | 10,000 | NO |
| 1261 | 166,000 | 175,000 | 155,600 | 216,500 | 237,400 | BUDGET |
| 1262 | 260,000 | 270,000 | 173,200 | 155,700 | 149,000 | |
| 1971 | 3,616 | 5,000 | 1,000 | 858 | 1,241 | |
| 6860 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | |
| 8610 | 13,200 | 10,907 | 6,800 | 6,480 | 9,313 | |
| 9110 | 1,000 | 1,000 | 1,000 | 1,000 | 66,300 | |
| 9120 | 140,300 | 165,300 | 72,000 | 68,700 | 19,500 | |
| **TOTAL** | **612,116** | **642,707** | **423,600** | **463,238** | **502,754** | |

In addition to the above funding for 1996, the Complex received an additional $2,500 Challenge Grant for Scottsbluff Public Schools Foundation for a 3-day Science Camp. Also received from the Scotts Bluff National Monument $2,000 and from the Bureau of Reclamation $2,500 to fund two YCC positions for our YCC program.

6. Safety

All employees participated in safety meetings during the monthly Complex staff meetings. Safety meetings included the use of videos, printed information and hands on demonstrations.

7. Technical Assistance

The Complex's wildlife survey information on bird population was submitted to both the Nebraska Ornithological Union and the National Audubon Society "Field Notes" on a quarterly basis.

Assisted in one area Christmas Bird Counts (CBC), which was the Scottsbluff CBC.

Completed two breeding bird surveys, the Dalton and the Berea surveys.

Project Leader Malone was an Advisory Team member for the Scotts Bluff National Monument General Management Plan Review and Update process.

Provided the Scotts Bluff County Weed Board with a letter of endorsement for their grant application to purchase and release biological control agents (insects) for Canada thistle along the North Platte River for the ecosystem and in partner shipping.

Provided Mr. Jim Ducey, Lincoln, with all the Crescent Lake bird surveys and casual observations. Mr. Ducey is using this information in a World Wide Web site called the Heritage of the Nebraska Sandhills.

Manager Malone provided technical assistance on wildlife to the Natural Resource Conservation Service (NRCS) on their trial Whole Farm and Ranch Plan in the North Platte Valley.

Manager Malone worked with NRCS in Perkins County on Wetland Reserve Program (WRP). Two WRP projects were accepted totaling 91.5 acres.

In partnershipping with and for the benefit of the ecosystem, Manager Malone and Range Tech Happold attended the monthly meeting of the NRCS South Platte Natural Resource District in Sidney to explain our Private Lands Program.

Manager McKinney, partnershipping with High School Teacher Mike Sarchet, made a presentation at the 58th Midwest Fish and Wildlife Conference in Omaha. Their presentation highlighted the need and suggested means for which natural resources professionals can become more actively involved in environmental education for the benefit of the ecosystem.

Manager Malone attended the Upper Niobrara-White Natural Resource District (NRD) and NRCS EQUIP Strategic Planning meeting in Chardon. An offer was made that the Fish and Wildlife Service would be available for use as technical assistance.

Managers Malone and McKinney provided technical assistance and partnershipped with Educational Service Unit #13 (ESU#13) on obtaining an Environmental Protection Agency (EPA) Challenge Grant of $25,000 for creating an environmental education curriculum for K - 12 grades in the local schools systems. Managers Malone and McKinney then assisted in the writing of the wetland curriculum with several teachers. See North Platte section.

8. Other

**Training**

Refuge Officers Behrends, Koenig, McKinney, and Shaul attended LE training at Marana, AZ.

Administrative Support Assistant Patrick attended a one day administrative workshop and a three day procurement training course in Denver.

Firefighters Flinsbaugh, Happold, and Stopak received training and certification in S-130/190. Firefighter French received training and certification in S-205. Firefighter Happold was certified for use of the John Deere 2640 and ATV. Firefighters Flinsbaugh, Happold, and Stopak completed the private pesticide applicators course.

Manager Mckinney attended a two-day workshop in North Platte regarding wetland restoration/creation and private land project evaluation.

Heavy Mobile Equipment Repairer Shaul provided equipment certification at the Colorado Fish and Wildlife Management Assistance Office.

**Private Lands**

The Complex is in charge of the Private Lands Program for 17 counties in western Nebraska. This area is considered as low priority in Nebraska for funds from the Private Lands Program. Consequently, the Complex receives very little Private Land funds to carry out this program. This year the Complex worked on 17 projects, completed 5 projects, dropped 4 as not suitable, and continued working on 8 projects at the end of the year.

A Private Lands Review Team has been formed which consists of the Complex, NRCS, NGPC, and NRD. This team reviews the private lands projects and discusses what programs are available for the landowner and which, if any, agency can help them.

**Challenge Grant**

The Complex received a Challenge Grant of $2,500 to assist the Scottsbluff Public Schools Foundation put on a three day summer science camp "SCAMP". One day of the science camp was devoted to programs on the Winters Creek Lake Unit of the North Platte Refuge. Several staff members and the YCC assisted with the day's events.

Worked with ESU#13 on writing a grant application for an EPA Challenge Grant of $25,000 for environmental education curriculum for grades K - 12. The grant was received by the end of the year, "then the work started". Local teachers were recruited to write the curriculum and a technical advisory committee was recruited to ensure the curriculum would be correct. By the end of the year, several meetings were attended by the two groups and writing had started on the curriculum.

Two other Challenge Grants were worked on, one in partnershipping with 12 emergency response agencies from eastern Wyoming to Bridgeport, NE to obtain a swift water search and rescue water craft. The second was in partnershipping with the Nebraska Ornithologist Union and the University of Nebraska to produce and distribute the Nebraska Breeding Bird Atlas. Neither grant was approved.

The Complex, in partnershipping with the North Platte Valley Water Coalition, applied for a Service Challenge Grant seeking $25,000 for the funding of a study that will answer a multitude of questions regarding the association of area wetlands and the man-made irrigation facilities in the North Platte Valley. By years end, $10,000 had been approved for this Challenge Grant project.

In partnershipping with the University of Nebraska and The Nature Conservancy, the Complex started working on a $13,500 Challenge Grant proposal from the National Fish and Wildlife Foundation. If received the grant will be used for experimental management for the benefit of the Endangered blowout penstemon.

Although not a Challenge Grant, the Complex and ESU#13 received $2,225 from the Math and Science Coalition for putting on a Jr. Duck Stamp Contest Workshop. See North Platte section.

In partnershipping with ESU#13 and to enhance ecosystem awareness, a total of eight Environmental Education and Watchable Wildlife funding requests for FY97 were completed and forwarded to the RO.

**Congressional Contacts**

Congressional contacts were made periodically with staffers for Senators Exon and Kerrey and Congressman Barrett to update them on happenings with the Complex, especially with the Lake Minatare EA.

**Ecosystem - Partnership - Coordination**

Signed an MOU with the Scotts Bluff National Monument to assist each other with fire fighting and prescribed burning. Assisted the Monument with one prescribed burn and attempted to assist with a second which did not occur due to the weather conditions.

The second coordination meeting with NGPC District I Office was held to discuss items of mutual concern and advise each other of upcoming projects each agency is planning.

Manager Malone was requested to be a member of the ad hoc committee for coordination of personnel and exhibits at the NGPC's Wildcat Hills Nature Center.

Manager Malone was asked by the Western Nebraska Sportsmen's Association to attend their meetings to keep them abreast of Complex and Service actions.

Both the Scotts Bluff National Monument and the Bureau of Reclamation have partner shipped with the Complex on the YCC program. Both agencies have provided funds for one YCC position for the program. With the Monument the agreement calls for approximately 240 hours of YCC work

at the Monument, while Reclamation has not requested any YCC services.

## J. OTHER ITEMS

### 3. Items of Interest

In January Managers Malone and Behrends, along with US Forest Service personnel, attended a NGPC meeting on big game hunting seasons and regulations.

A tour of the North Platte was given to Ritch Nelson in January. Ritch is the new Private Lands Coordinator for the NGPC District I Office in Alliance.

Tours of the North Platte were given to the new Congressional Staffers for Senators Exon and Kerrey's local offices in January.

Manager Malone attended a Scottsbluff City Council meeting in February to answer questions on a fire agreement between the Scottsbluff Fire Department and the Complex. The City agreed to sign a cooperative agreement for fire suppression responsibilities at the Lake Alice Unit on North Platte.

In March, Manager McKinney attended the State Coordination meeting with NGPC and the Nebraska Congressional Delegation/Staff Briefing.

Fishery Resources Administrative Officer Thyra Conn and Budget Analyst Vicki Tilden visited the Complex Office on April 26 to discuss administrative procedures and on a get acquainted visit.

A staffer for Senator Brown, Colorado, called in June on the Lake Minatare divesture to find out if water rights were involved in the divesture. The staffer was told the Service did not have any water rights. The federal water rights were under the Bureau of Reclamation.

Managers Malone and McKinney met in early August with the Bureau at their Mills, Wyoming office to discuss the

framework for needed revisions to our MOU on the North Platte in light of the pending divestiture of lands which include the Lake Minatare State Recreation Area.

Manager McKinney, Police Officer Koenig, ARD Webster, and Deputy ARD Baker participated in an August tour, sponsored by the Scottsbluff/Gering United Chamber of Commerce, on the Bureau's North Platte River projects. The tour included stops at several dams/reservoirs. At Glendo Dam in Wyoming, Manager Malone joined the tour and continued on with onsite inspections of Western Nebraska's irrigation facilities including the Inland Lakes (North Platte Refuge). A great deal was learned about the balance and mechanics of storing and delivery of water to the appropriated users. The North Platte Valley Water Coalition sponsored the latter part of the tour.

Five Scottsbluff City firefighters were red carded by the Service and listed as available for 21-day campaign assignments in mid-August.

Regional Outdoor Recreation Planner Doug Staller visited the Complex in August to discuss several topics on the Complex.

In September both Refuges had sightings of bull elk. This was the first ever sighting for the North Platte.

Manager Malone visited Scottsbluff City Manager Jeff White in October on the 1997 YCC program and our parnershipping with the Parks and Recreation Director to have the City fund a YCC position.

Associate Manager Bob Nagel visited the Complex in mid-October. Also in October, Deputy ARD Susan Baker visited the Complex Office and North Platte during a "Learn Nebraska" trip.

In November Manager Malone attended the Regional Fenced Animal Meeting in Denver.

The annual inspection of the FmHA easement in Dundy County was completed in late November. All easement signs are up and no visible problems were seen.

On December 4, Managers Malone and Behrends and Heavey Mobile Equipment Repairer Shaul attended a meeting with NGPC to finalize a cooperative disease response plan.

CRESCENT LAKE NWR

# ANNUAL NARRATIVE REPORT

Calendar Year 1996

CRESCENT LAKE NATIONAL WILDLIFE REFUGE

Ellsworth, Nebraska

INTRODUCTION

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G. WILDLIFE (Cont.) Page

## B. CLIMATIC CONDITIONS

Precipitation in 1996 was 18.85 inches, 1.26 inches more than the long term average. The water table remained exceptionally high, even higher than last year, apparently a holdover from the extra eight inches of precipitation we received in 1993. The year was 1.7° warmer than normal. The high for the year was 102°, the low was -22°. The 1996 weather summary along with historical information is detailed in Table 1.

Table 1. Crescent Lake NWR Weather Summary

| | Precipitation (inches) | | | Temperature (°F) | | | |
|---|---|---|---|---|---|---|---|
| | 1996 | 15 yr. Average | Snow Fall | Max | Min | Avg | 15 yr. Avg. |
| JAN | .40 | .38 | 10.1 | 63 | -16 | 22 | 22 |
| FEB | .00 | .30 | | 70 | -22 | 36 | 28 |
| MAR | .47 | 1.06 | 3.5 | 74 | -10 | 34 | 36 |
| APR | 1.55 | 1.89 | 12.5 | 84 | 23 | 49 | 50 |
| MAY | 4.68 | 3.10 | | 90 | 32 | 56 | 63 |
| JUN | 2.61 | 2.74 | | 89 | 44 | 69 | 71 |
| JUL | 1.91 | 2.21 | | 102 | 51 | 74 | 72 |
| AUG | 3.53 | 1.43 | | 92 | 49 | 71 | 74 |
| SEP | 2.87 | 1.45 | | 90 | 30 | 61 | 59 |
| OCT | .36 | .91 | | 87 | 19 | 54 | 52 |
| NOV | .34 | .75 | 3.5 | 70 | -4 | 30 | 38 |
| DEC | .13 | .35 | 1.5 | 64 | -14 | 25 | 25 |
| Total | 18.85 | **17.59** | **18.6** | | | | |

The last frost of spring was May 10, the first frost of fall was September 26, the growing season was 139 days.

## D. PLANNING

### 2. Management Plans

The following documents were written and submitted to the Regional Office during the year:

- Integrated Pest Management Plan Update
- Fire Step Up Plan

- Fire Dispatch Plan
- Water Management Plan
- Fire Management Plan - New Version
- Spill Prevention, Containment, and Clean-up Plan

Comprehensive Management Plan

In anticipation of writing this plan, a Mission and Goals have been envisioned which are quite different than the last generation of planning.

Mission: To serve as a model of the mixed grass prairie ecosystem as it might have existed when the first Caucasians saw the area.

Goal: Maintain the Refuge free of those introduced species which can dominate the landscape or cause basic changes in ecological processes. Examples include noxious weeds and carp.

Goal: Maintain a sense of solitude that was a part of the prairie and is becoming difficult for modern mankind to experience today.

Goal: Allow natural prairie ecosystems to work with little interference. The processes which cannot function today should be thoughtfully applied by management. Examples include substituting prescribed fire for wild fires, substituting hunting for large predators, and substituting livestock grazing for large wild ungulate grazing.

Goal: Apply necessary management to maintain high wildlife diversity and abundance which does not sacrifice the ideals of the previous goals. Examples include maintaining water management facilities, allowing/maintaining a judicious fixed amount of native tree cover, providing blowout habitat to maintain the endangered blowout penstemon, dredging to maintain wetland habitat which will otherwise disappear through natural ecological processes.

To get a feeling early on as to the public response to such ideas, whenever it was remotely appropriate in public presentations or even one on one conversations throughout the year, the Comprehensive Management Plan was discussed.

The proposed new mission and goals statements were discussed on several occasions with office visitors or interested persons contacted in the field. In two way conversations most people supported the new thinking. One hunter was concerned that access in the prairie primitive area should not be further restricted. Public speaking events where the plan was discussed this year and late in 1995 include:

| | |
|---|---|
| Alliance Rotary | little response, neutral reaction |
| Nebraska Game and Parks (annual coordination meeting) | expressed concern that sportsmen might be excluded from additional areas |
| North Platte Valley Sportsman's Association | neutral reaction |
| Denver Metro College Natural History Class | enthusiastic support |
| University of Nebraska Cedar Point Camp | some individuals thought the Refuge was over managed. |
| Western Nebraska Division Range Judging Contest | enthusiastic support |
| Steel Shot Programs | |
| Cabela's | neutral |
| Oshkosh | neutral |
| Pine Bluffs | liked the idea, were interested in seeing bison managed as wildlife |

3. Research and Investigations

**Crescent Lake NR-90: Ecology of the Yellow Mud Turtle (64510-811)**

The lead researcher for this study is Dr. John Iverson, Earlham College, Indiana. His study is ongoing, but other than maintaining climatic records, Dr. Iverson did no field work this year.

**Crescent Lake NR-91: Effect of Ground Water Recharge on Configuration of the Water Table Beneath Sand Dunes and on Seepage Lakes in the Nebraska Sandhills (64510-85-2)**

This study is the result of a 1979 cooperative agreement between the U.S. Fish and Wildlife Service (Service) and the U.S. Geological Survey (Survey) to study ground-water in the Nebraska Sandhills, specifically on portions of Crescent Lake NWR. A local man has been reading their wells biweekly under a special use permit.

**Crescent Lake NR-91: Effect of the Interaction of Ground Water and Lakes on Limnological Characteristics of Selected Lakes in the Nebraska Sandhills (64510-85-3)**

This research was implemented in conjunction with the cooperative agreement of 1979 between the Service and the Survey to study ground water on portions of Crescent Lake NWR.

The principal researcher, James W. LaBaugh, is investigating the processes that control the supply of biologically important chemicals between lakes and wetlands and their watersheds, particularly for lakes and wetlands that have no streams entering or leaving them.

This study has been expanding to include an emphasis on remote sensing. There was little activity on this project this year.

**Crescent Lake NR-96: Grasshopper Sparrow Habitat selection in Garden County (64510-96-1)**

Jeffrey M. Hopton, an undergrad, completed this project as part of his degree. His study compared land-use and habitat structure of the Grasshopper sparrow. Ungrazed portions of the refuge had significantly higher populations of sparrows than grazed lands surrounding the refuge.

Populations of sparrows correlated with percent liter cover and height-density of vegetation and residual material.

This was a one year study which we hope to replicate in the future.

## E. ADMINISTRATION

### 1. Personnel

Temporary firefighters employed this year included Marlin French of Lake Lillian, MN, Scott Stopak of Albion, NE, and Shanna Flinsbaugh of Manhattan, KS. Another firefighter was selected and accepted, but she backed out for a "better" job. By the time this transpired, the list of candidates had dwindled and only through some word of mouth information was Miss Flinsbaugh discovered and hired. This is the second year in which the system has broken down for temporary hiring. In 1997 we will do our own recruiting at local schools.

Marlin French was hired to fill the maintenance worker position which had been vacant for 17 months because of budget restrictions. The sorry state to which windmill and fence maintenance had fallen demonstrate how badly this position is needed.

## PERSONNEL

| | |
|---|---|
| Larry K Malone, CRL/NPL Complex Manager | GS-12 PFT |
| William D. Behrends, Refuge Manager | GS-11, PFT |
| Monte L. Shaul, Heavy Equipment Repairer | WG- 9, PFT |
| Marlin G French, Range Technician | GS- 6, TFT |
| Marlin G French, Maintenance Worker | WG-1 TAPER |
| Scott Stopak, Range Technician | GS- 5, TFT |
| Shanna Flinsbaugh, Range Technician | GS- 4, TFT |

Table 2 Staffing patterns at Crescent Lake NWR

| Fiscal Year | Full Time | Temporary |
|---|---|---|
| 1992 | 3 | 4 |
| 1993 | 3 | 3 |
| 1994 | 3 | 3 |
| 1995 | 2 | 4 |
| 1996 | 3 | 3 |

Table 3 1996 Training

| | | |
|---|---|---|
| Behrends | LE Refresher | 2/6-11 |
| | Firearms Re-qual | 8/22-23 |
| | CPR | 4/9 |
| Shaul | LE Refresher | 1/9-14 |
| | Firearms Re-qual | 8/22-23 |
| | CPR | 4/9 |
| French | S-205 | 6/6-8 |
| | S-212 | 9/8-9 |
| | Pesticide Applicator | Correspondence |
| Stopak | S-130/190 | 6/6-8 |
| | S-212 | 9/8-9 |
| | Pesticide Applicator | Correspondence |
| Flinsbaugh | S-130/190 | 6/6-8 |
| | Pesticide Applicator | Correspondence |

4. Volunteer Program

| | |
|---|---|
| Dorothy Behrends | 39 hrs. office help, dispatching, and biol. assistance |
| Keith Wiederspahn | 4 hrs. fishing week |
| North Platte Valley Sportsmen | 60 hrs fishing week |
| Tyson Shaul | 12 hrs. maintenance |
| Loren Blake | 8 hrs. photography |
| Jason Haines | 2 hrs. habitat management |
| Aaron Behrends | 2 hrs habitat management |

Figures 1&2. Volunteer Loren Blake shares his semi-professional photography with the refuge. Loren says the egret did not actually grab the hopper out of thin air, but was flipping him around, maybe to get him head first. CRL96NR1-LEB.

6. Safety

Table 4. Safety Topics

| Month | Topic |
|---|---|
| February | Antilock brakes |
| March | Loading and unloading equipment |
| April | Housekeeping |
| May | S.P.C.C. plan |
| June | Fence building and removal J.H.A.s |
| July | Fire shelters |
| August | Heat disorders, skid plate hazards |
| September | Firefighter safety |
| October | Blood born pathogen kits |
| November | Vehicle fire hazards, eyewash stations |
| December | Emergency vehicle operation |

- All fire extinguishers and smoke alarms were inspected.
- ATV and tractor training and certification were conducted by Shaul for various members of the refuge staff.
- Hazardous Material Plan and Spill Prevention Containment and Cleanup Plan were developed and reviewed by all personnel.
- CPR training for all staff
- Station safety inspection 5/23
- Blood born pathogen kits purchased
- Shaul provided heavy equipment certification for Colorado FWMAO

7. Technical Assistance

The refuge is an official weather station for the National Weather Service. The Refuge provides year-round daily high and low temperatures as well as precipitation and snow depth.

Production information was collected on upland game birds, in conjunction with the Nebraska Game and Parks Commission (Commission). Hunters are asked to fill out

information on pheasant and grouse hunting success and to leave a grouse wing or pheasant leg at collection boxes placed at refuge entrances. This information is then submitted to the Commission (Section H-8). Harvest data on deer is also collected and forwarded to Commission personnel. The refuge serves as a big game check station for the Commission and all big game harvested on the refuge must be checked in at headquarters.

Provided bird observation data to Jim Ducey for world wide web site "The Heritage of the Nebraska Sandhills" .

Did botulism control work on private lands in Garden County.

Developed a disease contingency plan with the Commission.

Was a tour site for the national meeting of the Geolologic Society. Provided a building for a discussion.

Joint project with the Commission to remove carp from Smith Lake and restock with game fish to provide a winter fishery.

Shaul provided heavy equipment certification for the Colorado FWMAO.

## F. HABITAT MANAGEMENT

### 1. General

Crescent Lake National Wildlife Refuge is located near the southwestern edge of the 20,000 square mile Nebraska Sandhills, located mostly in northwestern Nebraska. The predominant land form is a continuous grass-forb covered succession of dunes and swales with the water table lying very near the surface. Where the swales dip below the water table, subirrigated meadows, marshes and lakes have formed. In most cases no stream systems exist between wetlands. Most lakes are maintained solely by underground water sources, often including springs.

The refuge consists of 45,818 acres which includes 37,453 acres of native prairie grasslands, 4,755 acres of type II fresh meadows, 1,154 acres of type III shallow fresh marshes, 309 acres of type IV fresh marshes, 2,033 acres of type V open fresh water, 70 acres of noncommercial tree groves, 10 acres of brush and 34 acres of administrative lands including 12 miles of roads.

Figure 3. An exceptional sunflower bloom this year was food for the eye for a few days and then was food for the critters. 96CRL2-WDB

2. Wetlands

The 8,251 acres of wetlands at Crescent Lake are, for the most part, surface expressions of the ground water table. These basins were formed during periods of extreme drought, when scouring action of the wind removed sand from the swales and deposited it on the dunes. When the droughts ended, the water table rose and subirrigated meadows, marshes and lakes were formed in the low lying areas. Recent investigations are revealing that wetlands were also formed when old drainages were filled by drifting sands. In places the sand formed dams and

wetlands formed behind them. The dams are secure because they are porous, and water flows through instead of overtopping them and washing them out.

Water levels usually cycle naturally during the year with reasonably high water levels in the spring, low levels in the summer and fall and a gradual rise in the winter. A noteworthy increase in lake levels occurs in the fall after the first killing frost when evaporation and transpiration slow down and irrigators shut down their center pivot irrigation systems. Lake levels this year were higher than anyone living can remember, even surpassing 1995 high levels due to rainfall totaling 150% of normal in 1993. Water levels fell slowly during the year, but rose again this fall. By year's end the water table was still above normal even after below normal precipitation in 1994 and 1995.

Wetland management objectives are (1) to provide and enhance wetlands for wildlife, specifically National Species of Special Emphasis, (2) maintain and enhance wildlife and plant diversity, and (3) provide opportunities for compatible wildlife oriented recreation and interpretation.

In the past, efforts to enhance waterfowl production were in the form of protecting wetlands. Lakes and marshes were fenced to control grazing pressure. Over the years, many of these shallow lakes evolved into wetlands choked with emergent vegetation, predominately hardstem bulrush and cattail.

Beginning in 1994 and continuing through this year, mother nature gave us a hand opening up these monotype stands in the form of a massive muskrat population explosion. This summer the results of two winters of high population became visible as large areas of new open water showed up in the cattail stands. The number of huts counted in a midwinter survey increased dramatically in the 94-95 winter and expanded again in the winter of 95-96. While this winter's numbers are not in yet, all indications are that the rat population did not die off, but expanded even more. (See Sect. G.10)

Future plans to maintain refuge wetland habitat include the use of a "cookie-cutter" to assist in reducing wetland emergent vegetation. Designed for this very purpose, the "cookie-cutter" is widely used in the southeast as a non-chemical approach to create openings in dense stands of cattail and bulrush for preferred waterfowl pair habitat. This, or some other operation to deepen our wetlands, will be mandatory at some point because ecological forces are filling wetlands, but there are no natural deepening processes underway.

Rapid expansion of Phragmites became apparent this summer. It seemed as if the stands were becoming larger and more numerous, but it is difficult to assess the growth of these stands by relying on memory. This expansion was confirmed this year when several examples of these plants invading other stable communities such as snowberry were found. Major acreage is not yet involved, so to catch the problem early we began Phragmites control this summer. Chemical control is the only option as there are no water control possibilities on any of the wetlands where they are found. Unfortunately, budget limitations precluded significant work, but a few experimental plots indicate that Roundup will control the plant easily. If the water table does not recede soon, the more expensive Rodeo may have to be used, as parts of some stands are in water.

To further the ability to manipulate water levels in the Moore Valley lakes, a 1985 easement with a private landowner (Eldred) provided for the delivery of up to 13 cubic feet per second (c.f.s.) of fresh water to the refuge (See Section F-11). This supply of spring water provides several benefits--one of which is the flushing of salts from alkaline lakes located in the south portion of Moore Valley. These lakes were typical of lakes with high alkalinity, almost devoid of desirable vegetation. Now after several years of flowing fresh water these ponds are completely healthy.

Figure 4. Phragmites invasion of other stable communities like this snowberry stand is evidence of the expansion of the Phragmites type on the Refuge. 96CRL4-WDB

Management of lakes and wetlands in Moore Valley, which includes Martin, Ramelli, Smith, Bean Crossing, Perrin, Redhead, Upper Harrison, West Jones and Duck Slough, is accomplished with flash board water control structures. All other refuge lakes and wetlands are closed water systems and no manipulation was planned or conducted in these areas.

A synopsis of the water management accomplishments are listed as follows:

Martin & Ramelli Lakes

These lakes were drained last winter in an effort to kill carp which had somehow entered the Moore Valley system. The system had been clean but carp were noticed last summer.

This summer in a cooperative effort with the Commission, these two ponds and Smith Lake were treated with Rotenone to remove the carp.

Smith Lake

This lake was drained last winter for two projects. A burn was conducted to kill cattails. Cattail control was not especially successful because the refilling of the lake had to be delayed for the fish control project.

The other project was to provide a fishery. Agreement was reached with the Commission to stock this lake with panfish and allow winter fishing only. In July the lake and it's headwaters were treated with Rotenone and refilling was begun. In August fish stocking began with yellow perch. In August bass, bluegills, and crappies were also stocked.

Bean Crossing

The water control structure for this pond will need modification when funding permits as it tends to plug up when operated at maximum level.

Perrin Lake

This pond was held at maximum pool this year.

Upper Harrison & Redhead Lakes

These ponds were operated at maximum pools all year.

West Jones Lake

Maximum pool all year.

Duck Slough

This pool was refilled this year.

Eldred Diversion

Average flow through this ditch onto the Refuge for 1996 was approximately 7.5 cfs. Flow last year was 9.0, in 94 it was 5.8 cfs.

Flow readings from the Eldred diversion are recorded in Table 5.

Table 5. Monthly average flow readings (Parshall Flume) Eldred Diversion

| Month | Average Cubic Feet / Sec. 1995 | 1996 |
|---|---|---|
| January | 10.5 | 10.6 |
| February | 10.0 | 10.0 |
| March | 9.2 | 7.8 |
| April | 12.2 | 6.9 |
| May | 12.2 | 9.8 |
| June | 8.2 | 6.8 |
| July | 8.9 | 4.5 |
| August | 6.1 | 3.6 |
| September | 5.7 | 7.6 |
| October | 6.5 | 7.1 |
| November | 7.8 | 6.9 |
| December | 9.0 | 8.2 |

3. Forests

Crescent Lake NWR supports approximately 70 acres of trees. The refuge trees are limited to those around headquarters and small groves at Crane Lake, Hackberry Lake, Island Lake, Little Soddy, Lower Tree Claim, Seven Ponds, South Boyd, Roberts and Martin Lake.

The Upland Management Plan prepared last year defined what proportion of the habitat trees and brush should occupy. This refuge is different than many prairie refuges in that under the present climatic regime, trees are not maintaining themselves. Except for ash under an existing over story, and Russian Olive, there is almost zero recruitment, whereas fire, porcupine, and other

mortality is significant. Nearly every tree on the refuge can be traced back to some planting, either settlers, CCC, WPA, or refuge managers of days gone by.

This year more Russian olive trees were sawed and treated with roundup to prevent re-sprouting. Three-eighths inch (3/8") holes are drilled about every 1.5 inches around the circumference of the stump and a dab of pure Roundup put into each hole. Trees treated this way in 95 showed no re-sprouting this year.

About 25 cottonwood cuttings were planted to replace mortality, very few of these survived. Starting willows is more successful, but cottonwoods provide more wildlife benefits.

5. Grasslands

Grasslands are the dominant feature at Crescent Lake NWR and comprise about 82% (37,453 acres) of refuge lands. The refuge grasslands have been delineated into five soil types including choppy sands, sands, sandy, subirrigated meadows, and wetlands. Vegetation on these rangelands is typical of mixed prairie with interspersed forbs. Common grass species include prairie sand reed, sandhills muhly, switchgrass, Indiangrass, big bluestem, little bluestem, needle and thread, and Kentucky bluegrass.

Management objectives for refuge grasslands are to increase the warm season component of the type by 10%, and to keep the stands in early successional stages by applying periodic disturbance. Grazing, haying, and burning are management techniques employed on refuge grasslands to maintain vigor. A more complete discussion of each technique can be found in the appropriate sections (i.e., Sections F-7, F-9).

The grassland monitoring technique in use was initiated in 1988 to assist in the evaluation of the various habitat manipulation practices occurring on the refuge. The point-sampling method of Savory (1986) along with visual obstruction readings (VOR) and old photo points continued to be used in selected habitat units to

document habitat response to management practices and environmental occurrences (drought, wildfire, etc.). Last year, in the face of manpower cuts, it was decided to monitor transects only in the research natural areas and where some type of management had occurred. New transects were established on planned burn and graze areas and pretreatment condition recorded. By establishing new transects where management activities are planned, over the years many transects will be present over the refuge most of which will not be read except to record effects of management, or at some time in the future measure long term change.

In order to conduct grassland monitoring properly, a great deal of expertise is needed in rangeland plant identification. This skill as well as interpretation of several subjective variables continues to be a problem in search of a solution, in that the only people available for such work are temporary employees.

Figure 5. Not fishing line, but field dodder is one of the more unusual plants on the Refuge. 96CRL5-LKM

7. Grazing

Grazing has taken place on the refuge since, and prior to, its inception. When the refuge was acquired in the '30s, part of the purchase agreement stipulated that the sellers had the right to graze cattle for the following 10 years. The only restrictions were that no more than 4,000 head of cattle could be placed on the refuge at any one time and certain meadows could be fenced out for waterfowl protection. It has been estimated that nearly 45,000 AUMs were removed annually during those ten years and, as might be imagined, little was left of refuge grasslands at the end of that period. It was obvious that a reduction in grazing was necessary. By the 1960s permittees were utilizing 28,000 AUMs. More reductions were made so that by 1970 permittees were removing 19,000 AUMs. Reductions continued through 1993 when 995 AUMs were utilized. No grazing occurred in 1994, even though it was offered, no one bid.

A grazing plan first written in 1984, was revised as needed and submitted for approval in '95. This year the plan was signed. Most changes involved broadening it into an upland management plan.

Habitat improvement has been the game plan since 1984 and refuge grasslands are now in very good condition much to the credit of previous managers, so it was decided to implement a habitat maintenance program. The maintenance program is basically a treatment every six years in the meadows or every 20 years in the uplands.

The advantage of a maintenance program over emphasis on improvement is that there will be far fewer disturbed acres each year which will benefit most ground nesting birds. Also facilities to intensively manage livestock can be dramatically reduced. Many interior fences were built by the homesteaders or the CCC and are now in poor condition. Also none of our fences were built with deer and antelope needs in mind. No refuge fences can meet standards used by the Forest Service or BLM in big game ranges. With only a maintenance graze every 6 years, old

tumble down fences can be removed and temporary electric fence installed only when needed.

On the east end of the refuge which was proposed as a wilderness, the '84 plan called for removal of all livestock facilities. This still seems to be the best recommendation for this area as it has very little of the highly productive wetlands and meadows found on the west end of the Refuge. This year about six miles of fence were removed in this area. Windmills will also be removed, but more slowly (as they wear out). They will be replaced with dugouts or solar powered pumps to provide wildlife, firefighting and livestock water for the periodic maintenance grazes.

This year 463 AUMs were utilized in four pastures. Rather than short duration grazing, the cattle were left in place for the entire season which ended June 15. This was done to disadvantage cool season grasses and have the stock off by the time the warm season grasses begin to grow. The stocking rates used seemed about right, with the exception of units 28 and 35 which suffered a severe hailstorm just prior to turn in. These units never did catch up with grazing pressure, and the cows were moved out of both onto another unit sooner than planned. All pastures were well utilized by June 15, but not beat up. After the warm seasons had grown, at summer's end, it was hard to tell the areas had been grazed.

Figure 6. This years grazing was an effort to disadvantage the cool season grasses without beating up the pastures. 96CRL6-WDB

9. Fire Management

The refuge maintains five cooperative fire agreements with adjacent fire districts and one cooperative agreement with the U.S. Forest Service to provide mutual assistance in the event of wildfire.

The refuge had only one wildfire this year. This resulted when a black line was being burned out in preparation for the Smith Lake prescribed fire. The line was burned through some heavy duff. Burning was terminated at 10:00 am and no smoke was seen. An employee returned and saw nothing from 11:00 am to noon. He was returning for another check at 2:00 pm and saw smoke as he approached. Refuge neighbors showed up at about the same time and the escaped fire was nearly under control when other volunteer units arrived. At that time the fire was mostly controlled at about 20 acres, but it

was still burning in some cattails which would have been difficult to put out because of limited access.

A huddle was called and it was decided to complete the prescribed fire. The escaped fire was within the blackline prepared for it, and some of the volunteers wanted to get some lighting experience, which could have application if back firing were ever necessary on a wildfire. The 770 acre prescribed fire was then completed as it had been planned except for some small slop-overs on the west side.

French was dispatched twice to CMR Refuge for a total of 25 days. Stopak went once for 21 days. They served as initial attack while the regular CMR crew was off on interagency assignments and there was high fire danger in the area.

A refuge step-up plan was prepared, and automatic detection patrols following thunderstorms were initiated whenever the fire danger was high.

Table 6. 1996 Wildfire Suppression Activities

| Land Status | Date | Acres | Cause |
|---|---|---|---|
| Refuge | 4/5 | 770 | escaped prescribed |

Two prescribed fires were accomplished this year. The Island Lake SW burn was done to provide a goose brood rearing area.

The Smith Lake burn was done to remove dead standing cattail tops prior to flooding in an attempt to cause cattail mortality.

Equipment purchased this year included a flotopump and three 1500 gallon plastic agricultural tanks. The tanks will be buried in the Prairie Primitive area as water sources to replace the windmills which are being phased

out to improve the aesthetics of the area and reduce the maintenance workload.

A contract to do annual maintenance and turn windmills on for the summer season was let. With the laborer position vacant the Refuge did not have the manpower to accomplish this work. This contract was issued due to the concern voiced by cooperating fire districts when windmill maintenance was not accomplished in the 95 season. The cooperators wanted permission to turn the wells on themselves, but this could not be done year after year because the windmills would have fallen into disrepair. Using temporaries to do the work was not an option because of the safety concern and technical skills required.

10. Pest Control

The remaining leafy spurge patch was patrolled this year, four weeds were found which were treated with Roundup.

This year, 100 gall flies, 100 seed head weevils, 100 defoliating beetles and 100 stem mining weevils were released on the north side of the Goose Lake peninsula for control of Canada thistle.

Thistles were controlled on meadows surrounding Goose, Island, Roundup, Gimlet, Deer, and Hackberry Lakes, Moore Valley and Meeker by treating with Rodeo or Roundup mixed with 2,4-D. Treatments began as soon as weeds began to bud this year and temporaries joined in the project. In a little over a month most of the known patches were hit. Contrary to common advice about thistle control, we are seeing better success with treatments during the blooming period than at other times.

No mowing was done this year because mowing is proving to be at best ineffective. The practice may even spread the weeds because of the ground disturbance.

Musk thistles discovered and treated on the Refuge for the first time last year in the Lower Moore Valley were not seen this year.

Russian olive trees around Gimlet Lake and in Roberts meadow were cut and the stumps treated with Roundup.

11. Water Rights

In 1985, a construction and maintenance easement for a ditch and associated water was obtained from Victor Eldred, an adjacent landowner. In exchange for maintenance of approximately seven miles of ditch the refuge obtained a water right for 13 cfs of water. The water comes from a subirrigated meadow located one-half mile from the refuge's Moore Valley. Mr. Eldred ditched this meadow in 1915 and has been diverting the ground water south, bypassing the refuge wetlands. Historically, this water would have flowed southeast to the refuge. The construction of a 1 3/4 mile diversion ditch in 1985 brought the water back onto the refuge. In 1986, a permit (#A16382) was issued by the Nebraska Department of Water Resources granting the Service a 13 cfs flowage right. A Parshall water measuring flume was installed in the Diversion ditch in 1986. Average flow for 1996 was 7.5 cfs. (See Table 5, Sec H.2.)

A concern of the Refuge for decades has been water rights on Crescent Lake, a 982 acre lake located on private land one-quarter mile south of the refuge. Prior to the establishment of the refuge, the Blue Creek Irrigation District obtained storage rights on the lake, which fed Blue Creek via a man-made ditch. After establishment of the refuge in 1931, the District attempted to lower the outlet of Crescent Lake. The Service maintained that an outlet placed too low would lower refuge lakes via the groundwater. An agreement was reached between the U.S. Attorney representing the Service and the Irrigation District on a mean sea level of 3776.65 for the outlet.

In the 1960s and again in the early 1970s the Irrigation District abandoned the ditch which allowed it to fall into disrepair. The Nebraska Water Resources Commission held adjudication hearings on the Irrigation District's water rights in 1984. At the hearings the Service established its use of waters originating on the refuge along with testifying to the non-use by the irrigation

district. The State canceled the irrigation district's water rights on Crescent Lake and returned the water rights to the landowner.

In 1995 lake levels rose so high that it flooded the road to Oshkosh, the main access road used by the Refuge. To alleviate the problem, the county replaced a culvert under the road which had been unused in drier years. This culvert allowed water to flow down the old Blue Creek Irrigation ditch. This caused a flurry of activity by the irrigators. They accused the Refuge of placing the culvert, thereby causing too much moss to flow through the system and damage their equipment. In late summer one man came out and replaced the boards in the water control structure apparently to store water for next year. Of course this caused the lake to flood the road again. The county had to come out and pull the boards, but they were nobody's dummies, they took the boards to town with them. This year the county lowered the culvert a few inches which gets the lake comfortably away from the road. There was no harassment from the irrigators this year.

12. Wilderness and Special Areas

A large part of the eastern portion of the Refuge received nomination for wilderness consideration and was submitted to Congress in 1972, however, no final decision was ever made.

In revising the 1984 grazing plan into an upland management plan, a management scheme for the area was outlined. The plan, as written in '84, called for removal of livestock facilities and minimal management, however, this was never done because of a desire to improve habitat through short duration crowd grazing. The revised plan reaffirmed the original plan's management scheme, and went further in defining what will and will not be acceptable practices in this area which is essentially left in limbo by the unresolved wilderness status of the area.Under the management guidelines in the updated plan, we will continue to use vehicles for administration of the area. ATVs will be used for light

maintenance, surveys, and general access. All vehicles can be used for firefighting and heavy maintenance. We believe that if we can manage the area under these practical rules, we can provide an area which is not common in a place like Nebraska without the expense of horseback management and the risk of providing fire control by primitive means.

The new plan also includes the possibility of returning bison to the area if it is feasible to manage them as wildlife, not big, mean-tempered livestock. This means that population control by hunting will have to be possible, and the brucellosis problem is manageable. The problem with hunting is that animal rights groups have stopped almost every bison hunt proposed in modern times. The possibility of elk reintroduction is also considered.

The groundwork is also being laid to modify public use of the area. Changing the public use road from a loop to a single route is being considered; as is allowing camping at designated pack-in campsites. Public participation is being sought by bringing up the subject for comment at meetings where Refuge personnel are invited to speak. Thus far the idea has been discussed with the Alliance Rotary, Platte Valley Sportsmen, Pine Bluffs Sportsmen, and Cabela's. The Commission was also briefed on the proposal.

Two Research Natural Areas (RNA) are designated on the Refuge, Goose Lake (940 acres) and Hackberry Lake (172 acres). The Goose Lake RNA has not been grazed, hayed or intentionally burned since 1948. Hackberry Lake RNA has likewise not been disturbed since 1951, with the exception of a spring burn on the northern meadow portion in 1983 and a short duration spring graze in 1988. The boundaries of these two areas were posted this year. Since the boundaries are within the closed area and will never be seen by the public, the signs were produced force account. In addition to a painted legend, the aluminum signs were also stamped Goose Lake or Hackberry RNA so they can provide a boundary marker into the very long range future.

## G. WILDLIFE

### 1. Wildlife Diversity

Located in the mixed-prairie ecotone and demonstrating aspects of both western short-grass and eastern tall-grass prairie ecosystems, Crescent Lake NWR contains a variety of wetland and terrestrial habitat types which in turn support a variety of wildlife species native to the Nebraska Sandhills region. The refuge's geographical location in the mid-continent is responsible for a unique blend of species from the north, south, east and west whose ranges overlap in this transitional area. A total of 279 bird species have been recorded of which 85 are known to nest. In 1995, 173 species were recorded on the refuge, 75 species during the breeding season. Of the 55 mammal species that have been recorded in the sandhills region of Nebraska, 37 have been documented as occurring on the refuge. An additional fifteen are believed to occur on the refuge, but have not been documented. Extirpated mammal species include the black-footed ferret, blacktail prairie dog, elk, American bison, grizzly bear and the plains wolf. Sixteen (16) species of reptiles and amphibians have also been documented as occurring on the refuge.

### 2. Endangered and Threatened Species

The refuge provides habitat for two endangered species - the blowout penstemon and the peregrine falcon. The endangered least tern has been documented as occurring on the refuge in the past. As far as is known the peregrine is only migratory here.

The blowout penstemon is endemic to the Nebraska Sandhills. This plant is known to exist in seven population groups, located in five counties. Blowout penstemon requires a substrate of eroding and shifting sand, which is typical of active blowouts. This species is dependant on continuing wind erosion to maintain current blowouts or to create new ones. The blowout penstemon is the only endemic plant in Nebraska and one of the few endemics to be found in the Great Plains.

The tenth annual blowout penstemon (*Penstemon haydenii*) inventory was conducted during the period of June 11 - June 19. There are 125 blowouts permanently marked with metal tags. Of these only 58 were actively growing plants in 1996, a net decline of 11 from 1995. There were 608 total plants recorded this year. Of the 608 plants, 284 were vegetative and 324 were flowering. This continues an overall decline in the population since the first survey in 1987 (2058 plants). There is also a drop from 1995's total of 624 plants (438 flowering, 186 vegetative). Approximately 80% of the blowouts surveyed were noted as healing due to pioneering of other plant species. We photographed most of the blowouts in an effort to start documenting this process.

The threatened bald eagles nested on the west side of Hackberry Lake this year. They nested in the same tree in 1995. One eaglet hatched prior to April 15. The eaglet fledged in early June and all three birds left the refuge in late July, with occasional sightings again in November-December.

Twenty (20) Species of Management Concern (formally Category II Candidate Species) were found on the refuge. The following is a summary of their status.

MIGRATORY

Red-headed woodpeckers, field sparrows, lark buntings and ferruginous hawks were seen during spring and fall migration.

BREEDING

| | |
|---|---|
| American Bittern | See Marsh and Water Birds |
| White-faced ibis | Groups of 3-5 were seen on the refuge during breeding season. No nests have been found since 1992. |

| | |
|---|---|
| Trumpeter swans | A pair was again on Deer Lake during the breeding season, however no young were ever seen. |
| Northern Harrier | See Raptors |
| Upland sandpiper | Present during the breeding season. |
| Long-billed curlew | Present during the breeding season, young documented. |
| Black terns | Present during the breeding season, young documented. |
| Barn owls | See Raptors |
| Burrowing owls | Present during the breeding season. |
| Short-eared owls | Present during the breeding season. As many as five were seen at one time during the fall. |
| Loggerhead shrike | Present during the breeding season, one nest found. |
| Dickcissel | Present during the breeding season in good numbers. |
| Lark sparrow | Present during breeding season. |
| Grasshopper sparrow | Present during breeding season. See also Research and Investigations. |
| Eastern meadowlark | Present during breeding season. |
| Swift fox | One sighting west of the refuge. |
| Yellow mud turtle | No study this year. |

3. Waterfowl

The Sandhills region, with its numerous lakes, marshes and wet meadows, is considered to be the most significant waterfowl production area in Nebraska and is also important as a waterfowl maintenance area.

Waterfowl use days for the refuge for 1996 were calculated at 882 swan, 53,727 goose, 2,814,229 duck, and 664,501 coots. (Table 7) Bi-weekly surveys of refuge waterfowl are done throughout the year.

Table 7. 1995 WATERFOWL USE DAYS

| | COOT | SWAN | GOOSE | DUCK |
|---|---|---|---|---|
| January | - | 10 | - | - |
| February | - | - | 4,500 | 17,100 |
| March | 9,000 | - | 6,225 | 313,665 |
| April | 11,430 | 360 | 5,610 | 308,280 |
| May | 22,723 | 62 | 9,038 | 788,485 |
| June | 50,158 | 60 | 9,269 | 31,434 |
| July | 18,570 | 62 | 8,370 | 26,160 |
| August | 108,630 | 62 | 4,035 | 118,485 |
| September | 212,460 | 60 | 6,000 | 205,770 |
| October | 228,830 | 62 | 680 | 654,630 |
| November | 2,700 | 90 | - | 175,110 |
| December | - | - | - | - |
| TOTAL | 664,501 | 882 | 53,727 | 2,814,229 |

Refuge wetlands remained frozen during January. In February, the Panhandle area experienced a warming trend that thawed many area lakes and waterfowl (mostly Canada geese and mallards) were observed utilizing the refuge by late February.

Waterfowl numbers increased substantially beginning in March. A sharp increase in waterfowl numbers due to fall migration was seen beginning in September. Mallards, shovelers, gadwalls, and ruddys contributed the bulk of the big migration numbers and were also the predominant breeders.

A 58% sample survey was conducted on the goose tubs to estimate production. With 55% tub use, 4.5 eggs/nest, 80% hatching success and 3% in nest mortality our production was estimated at 203 goslings. Because of warm weather and early ice out tubs were not hayed until March. There were also a dozen tubs that weren't hayed due to the draw down in Upper Moore Valley.

In addition to nesting species, other species of waterfowl observed on or flying over the refuge include snow goose, ring-neck duck, lesser scaup, common goldeneye, bufflehead, and common and hooded mergansers.

This year we had 19 delta hen houses which were hung on the same pole below the goose nest structures. Eleven were used, seven were successful, producing 56 ducklings. Seven nests were unavailable for use due to high water. Four were predated by raccoons, all near the headquarters area. Two of the nests may have provided raccoons access the goose tubs. This will require continued monitoring.

A botulism die-off was discovered in July on Crescent Lake just south of the refuge. Seventy-nine (79) birds were removed from Crescent Lake. Western grebes comprised most of the mortalities. No birds were found after August.

4. Marsh and Water Birds

Significant marsh and open water habitats are found on the refuge and provide for the needs of a variety of marsh and water birds.

The grebe survey was done on Goose Lake on May 29. A total of 357 adult eared grebes were present and 263 nests were found. No live young were found. Egg counting was interrupted at nest 128, at that point 343 eggs were present which averages 2.67 eggs/nest. Resulting in a total estimate of 702 eggs on Goose Lake. This was the first year nesting was confirmed on Goose lake. Deer Lake, the traditional nesting site, was surveyed by counting adults with a spotting scope. Three hundred seven (307) adults were counted, but no nests

were seen. The grebes usually nest in open water with submergent vegetation. Due to high water there was little submergent vegetation making it to the surface at breeding time. The grebes at Deer Lake may, however, have nested in emergent rushes as they did on Goose Lake.

A May 29 survey of the double-crested cormorant rookery on Goose Lake recorded 100 nests, 93 young, and 220 eggs. The count in 1995 was 41 nests, 53 young and 59 incubating eggs, thus a substantial increase in the population this year. There were approximately 262 adults in the area. The high water of the last three years has eliminated the traditional nesting island. The colony has relocated to the north end of the lake near goose tub #43. They have used the goose tubs for nesting. Usually the geese arrive first and hatch young before the cormorants use them. However, the cormorants arrived early and excluded the geese from using them this year. There was no evidence of Newcastle's disease in the cormorant rookery this year.

Figure 8. Flinsbaugh conducting the cormorant colony survey. 96CRL8-MGF

Because of the draw down, Smith Lake (the traditional nesting site) was not searched this year for the black-

crowned night heron colony. A survey of Goose Lake on June 11 flushed seven adults, but only two nests were found.

Marsh and water birds are surveyed bi-monthly in the same way as the waterfowl. Sampling in this way works fairly well where large numbers of relatively highly visible waterfowl are being counted, but erratic results are common when dealing with the lower numbers and hard to see marsh birds. We are relying more on the colony nesting surveys to monitor populations and developing new surveys for marsh birds.

The first of these new surveys was conducted for American Bitterns. The survey is a male breeding "song" survey. Conducted on mornings in late May, the survey was completed on Smith, Goose, Gimlet and Island lakes. This is a partial survey and will be used to track population trends over time.

**AMERICAN BITTERN SURVEY**

| **LAKE** | **1996** | | | **1995** | | |
|---|---|---|---|---|---|---|
| | Males | Songs heard | Songs/ station | Males | Songs heard | Songs/ station |
| Island | 23 | 28 | 1.5 | 30 | 42 | 2.3 |
| Gimlet | 2 | 6 | 1.5 | 1 | 2 | 0.5 |
| Smith | 2 | 3 | 0.3 | 11 | 20 | 2.0 |
| Goose | 8 | 10 | 1.0 | 19 | 30 | 3.0 |
| Total | 35 | 47 | 1.2 | 61 | 94 | 2.2 |

The total male population for the four lakes dropped 41.6 percent from 60 to 35. This is somewhat consistent with the drop in average songs per station, which dropped 49.8 percent. A large part of the drop can be attributed to the draw down of Smith Lake in 1996. Smith Lake's estimated population dropped from 11 to 2 males. However, the drop on Goose and to a lesser extent Island, show a decline in the breeding population.

Figure 9. A new bittern survey has been conducted for the second year now. 96CRL9-LEB

The great blue heron rookery located on Crane Lake was again surveyed in 1996. A pre-nesting survey showed 72 nests up from 68 nests in 1995. A second survey showed use in 58 nests up three from 1995. Using clutch size and egg-fledgling percentages from THE GREAT BLUE HERON OF KANSAS, our estimated production was 124 young fledged.

5. Shorebirds, Gulls, Terns and Allied Species

Crescent Lake NWR provides habitat for a variety of shorebird and allied species with its grasslands, mud flats, and numerous shallow lakes. Thirty-one (31) shorebird species have been known to occur on the refuge along with seven gull and five tern species. The refuge has previously been listed by the Manomet Bird Observatory as one of the 20 most important spring shorebird stopover sites in the country. Alkaline lakes produce an abundance of invertebrates, which in turn supply a reliable source of food for the large numbers of migrating shorebirds in the spring or fall.

Species breeding on the refuge during 1996 included killdeer, upland sandpiper, willet, American avocet, , Forster's tern, and the black tern.

Spring shorebird migration was most evident in mid April with the arrival of greater yellowlegs, lesser yellowlegs, Baird's sandpiper, least sandpiper, marbled godwit, long-billed dowitcher, Wilson's phalaropes, Franklin's gull and ring-billed gull to the refuge.

Fall shorebird migration began in earnest in mid August when large numbers of shorebirds were observed on the refuge. Bird surveys conducted after October 28 showed no shorebirds.

6. Raptors

The open grasslands of the Nebraska Sandhills, interspersed with areas of trees, provide excellent habitat and food sources for a variety of raptor species. Twenty-seven (27) raptor species have been known to occur on the refuge. In 1995 the survey method used to monitor breeding populations was changed. Red-tailed hawk, Swainson's hawk, great horned owl and bald eagle were surveyed by investigating all treed areas on the refuge to locate nests. The American kestrel and barn owl were surveyed by monitoring nest boxes. The northern harrier was surveyed by delineating territories. This was accomplished by plotting observations of males on a map.

The eastern screech owl was an accidental find of its nest cavity.

Raptor Survey Results

| **Species** | **Number of Breeding Pairs** | **Number of Young** |
|---|---|---|
| Red-tailed Hawk | 1 (Krider's) | Unknown |
| Swainson's Hawk | 3 | 4 |
| Bald Eagle | 1 | 1 |
| Great Horned Owl | 3 | 6 |
| Northern Harrier | 10 | Unknown |
| American Kestrel | 4 | > 14 |
| Barn Owl | 3 | 10 |
| Screech Owl | 0 | 0 |

Species observed during the rest of the year include rough-legged hawk (especially prevalent in the fall and winter months), broad-wing hawk, sharp-shinned hawk, osprey, golden eagle, prairie, and peregrine falcons, short-eared, and burrowing owl and Cooper's hawk.

Ten new barn owl boxes were installed on windmills and on the fire towers.

Figure 10. Eight barn owl boxes were placed on windmills. 96CRL10-MGF

7. Other Migratory Birds

In continuing attempts to monitor all populations on the refuge and be consistent with ecosystem management new bird surveys were initiated in 1995. Breeding bird transects, in three habitat types, were conducted to monitor birds not covered in the preceding sections (primarily passerines). In 1996, 37 species were found, up from 28 in 1995. By habitat, results were; wooded - twenty - four species, meadows - thirteen species and

uplands - four species. Numbers were about the same as 1995, except robin, orchard oriole, mourning dove and both eastern and western kingbird numbers were half that of the previous year.

Nests were built in all three bluebird boxes by tree swallows this year.

We had a swallow die off during spring migration. We didn't send any to the health lab, but we heard others were having similar die offs.

8. Game Mammals

In conjunction with the state season and regulations, the refuge conducted a mule deer/white-tailed deer firearm hunt, archery hunt, and black powder hunt. The refuge runs a mandatory check station each year. (See Sect. H.8.) Analysis of age data taken in addition to information taken for the State is shown in Table 8. This age composition reflects a steady population. The harvest ratio of mule deer to white-tail was .86:1. This ratio has increased compared to the average of (.64:1) since 1980.

Table 8. Age Composition Crescent Lake
Deer Harvest 1992-1996 Combined

| | ½ | 1½ | 2½ | 3½ | 4½ | 5½ | 6½+ |
|---|---|---|---|---|---|---|---|
| mule & white tail | 6 | 61 | 55 | 36 | 28 | 7 | 4 |

AGE AT HARVEST

Pronghorn antelope were observed periodically throughout the year. Lone pronghorns were observed at the east end of the refuge in mid and late April. With one newborn found in Phillips Flats. Pronghorn antelope were extirpated from the Sandhills by the 1900s and, although not common today, are gradually starting to make a comeback. Removal of fences in the eastern part of the refuge has begun. The resulting large open areas may be more conducive to their return.

10. Other Resident Wildlife

The 1996 muskrat hut count was done 2/14 and 2/16. This count is normally done in conjunction with the annual goose tub maintenance. This year, the lakes thawed the first of February, so normal goose tub and rat survey work was not possible. Because there was an obvious muskrat population explosion in 1995, an extraordinary effort was made to make the count so the event could be recorded.

The count is normally done by riding the perimeter of the open water (on ice) with an ATV. This year the count was done by riding the shoreline, or counting from high points. During the count the difference between the two methods was recognized and a method of counting was employed that simulated counting from the ice as nearly as possible. It is also noted this year that the huts are extra large, as much as 4 - 5 feet high where most years they run 2 - 3 feet high.

On September 21, Shaul observed a bull Elk west of Gimlet Lake. The elk moved through quickly with no other sighting reported.

Table 9 1996 Muskrat House Count

| LAKE | # OF HOUSES 1995 | 1996 |
|---|---|---|
| Island | 85 | 208 |
| Hackberry | 38 | 56 |
| Little Hackberry | 6 | 2 |
| Smith | 19 | 14 |
| Gimlet | 9 | 8 |
| Goose | 26 | 74 |
| Ramelli | 24 | 24 |
| Roundup | 15 | 35 |
| Rush | 7 | 9 |
| Mallard Arm | 16 | 9 |
| Crane | 45 | 15 |
| Martin | 12 | 22 |
| Shafer | 20 | 11 |
| L. Harrison | 6 | 4 |
| Deer | 195 | 160 |
| West Jones | 6 | 8 |
| Christ | 28 | 37 |
| Perrin | 34 | 19 |
| Border | 6 | 0 |
| Redhead | 8 | 6 |
| U. Harrison | 12 | 10 |
| Lost | 11 | 6 |
| U. Tree Claim | 6 | 4 |
| L. Tree Claim | 2 | 0 |
| | 637 | 742 |

Table 10. Rat house counts 1987-1996

| | YEAR | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 |
| Number of Muskrat Huts | 86 | 720 | 1929 | 829 | 369 | 515 | 278 | 383 | 637 | 742 |

The spring sharp-tailed grouse lek survey was conducted in April. A total of 25 active dancing grounds were

surveyed with 188 displaying males, for an average of 7.5 males per ground. These numbers have increased and are similar to those just after the population crashed in 1989-90. Hopefully this recovery will continue.

Table 11. Sharp-tailed Grouse* Spring Lek Survey 1986-1996

| Year | Total # Dancing Males | Active Grounds | Average # Males/Grd | Average # Birds/Grd | Males/Sec Habitat |
|---|---|---|---|---|---|
| 1986 | 361 | 45 | 8.0 | 13.7 | 5.46 |
| 1987 | 413 | 43 | 9.6 | 15.7 | 6.25 |
| 1988 | 341 | 38 | 9.0 | 13.3 | 5.16 |
| 1989 | 249 | 41 | 6.1 | 10.0 | 3.77 |
| 1990 | 168 | 28 | 6.0 | 10.7 | 2.55 |
| 1991 | 193 | 28 | 6.9 | 13.1 | 2.92 |
| 1992 | 230 | 28 | 8.2 | 16.2 | 3.48 |
| 1993 | 157 | 27 | 5.8 | 10.8 | 2.38 |
| 1994 | 123 | 22 | 5.6 | 8.5 | 1.86 |
| 1995 | 92 | 18 | 5.1 | 8.3 | 1.40 |
| 1996 | 188 | 25 | 7.5 | 10.1 | 2.80 |

* Only males counted

Grouse wing envelopes provided to refuge hunters are collected annually. A total of 67 grouse wings were aged. The juvenile/adult ratio was 2.0:1

Refuge volunteers conducted a pheasant crow count along two routes, during the spring. Crow counts were conducted the last week in April. The refuge breeding population for 1996 was estimated at 294 birds compared to the 1995 count of 403. This years count is below the ten year average of 393.

Pheasant legs were collected in hunter envelopes and aged by spur length. The pheasant harvest ratio (juvenile/ adult) was 1.3:1.

Table 12. Grouse and Pheasant Harvest Ratio (Juvenile/Adult)

| | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|
| Grouse | 2.0/1 | 2.1/1 | 1.6/1 | 2.1/1 | 1.2/1 | 1.7/1 | 1/1 |
| Pheas. | 1.3/1 | 1.3/1 | 2.4/1 | 1.6/1 | 1.8/1 | 1.8/1 | 1.7/1 |

11. Fisheries Resources

Island Lake is managed as a recreational fishery. After many earlier unsuccessful attempts, the lake was successfully rid of carp in 1978 by pumping it down to a big mud hole before Rotenone treatment. The lake was then restocked with warm water sport fish including largemouth bass, bluegill, crappie, perch, sauger, walleye, and saugeye. The Commission manages the fishery with the concurrence of the refuge. Their recent surveys are showing that yellow perch are the only fish in the lake which are reproducing, and the numbers indicate that the population is steady at this time, probably due to predation on the perch by walleyes.

In an experiment to see if other species in Island could be made self sustaining, an artificial redd was constructed by placing a semi load of gravel on the lakebed. The gravel was hauled onto the ice using the John Deere Gator and dumped through holes. An old file photo of a Refuge dump truck which had fallen through the ice when the accumulated weight of several previous loads broke it convinced us to take the trouble to put the gravel through the ice as we went.

In cooperation with the Commission, Smith Lake is going to be developed into a perch/panfish winter fishery. The lake was thought to be carp free, but netting in 1995 found it to contain carp. To eliminate the carp, Martin, Ramelli, and Smith lakes were drawn down in the fall of 1995 to freeze them out. During July deeper pools were Rotenoned by air and ground. Stocking began in August with 30,000 yellow perch. Bluegill and large mouth bass will also be stocked. Plans are to open the fishery in the fall of 1998.

15. Animal Control

The snake trapping program was discontinued in 1994. Dr. Iverson had been running the leads for us, but has not done any field work on the Refuge for two years. Prior to Dr. Iverson taking over the trapping, the Refuge had been doing the work. This is not possible with recent personnel cuts, so the snake lead was completely removed.

A porcupine population explosion is in progress on the Refuge. Twenty-seven (27) porcupines were removed in '95 and 12 this year, and still their feeding is very apparent.

Four coyotes were removed from the refuge this year.

## H. PUBLIC USE

1. General

Crescent Lake NWR is located on the southwestern edge of the Nebraska Sandhills. The nearest community is Oshkosh, population 1,100, located 28 miles to the south via a very bad single-lane oil and dirt road. The refuge trades frequently in Alliance (population 10,000), located 45 miles northwest and accessible by even poorer roads. The nearest large community are the twin cities of Scottsbluff/Gering, located 111 miles to the west, with a population of about 22,000. These communities and neighboring ranches make up the base population from which 75 percent of the refuge visits are drawn. Quality of the access roads is a major factor influencing the amount of use the refuge sees.

The refuge provides a wide variety of recreational opportunities to the visiting public. Consumptive use represents a large percentage of refuge visits and activities include warm water fishing and hunting for mule and white-tailed deer, prairie grouse, and ring-necked pheasant. Non-consumptive uses include wildlife observation, hiking, picnicking, and photography. Bird watching is also an important activity at Crescent Lake NWR. By monitoring our pamphlet use this year we

determined that 75% of our visitors do some bird watching.

A total of 8,585 public use visits were recorded in 1996 of which 2,344 were consumptive users (hunting and fishing). This compares to a total visitation of 6,562 recorded in 1995. Table 13 shows annual visitation at the refuge for the period 1986 - 1996. Visitation is calculated utilizing traffic counters located at three refuge entrances.

Table 13. Public visitation data for the period 1986-1996

| YEAR | # OF VISITORS |
|---|---|
| 1996 | 8,585 |
| 1995 | 6,562 |
| 1994 | 6,429 |
| 1993 | 12,592 |
| 1992 | 21,291 |
| 1991 | 25,502 |
| 1990 | 11,735 |
| 1989 | 12,020 |
| 1988 | 12,469 |
| 1987 | 13,030 |
| 1986 | 19,202 |

The distribution of visits between various activities was adjusted this year to reflect a quarterly report period as opposed to the older monthly report. This adjustment is still being refined as we are basing the changes on interpretation of windshield surveys rather than hard data.

Interpretive signs in the Island Lake kiosk were changed occasionally to provide information of interest to the visiting public. Signs entitled Deer Trail to Disaster, A Place for Wildlife, Spring Madness, and Nesting Ducks and Predators were rotated on the kiosk.

2. Outdoor Classrooms - Students

Several classes from the University of Nebraska, Cedar Point Field Station, toured the refuge throughout the summer months and studied such subjects as entomology, ecology, ornithology and limnology. High school biology classes from Lodgepole and Hay Springs visited the Refuge.

The Refuge was a tour stop for the annual meeting of the National Geologic Society.

5. Interpretive Tour Routes

A 13-station self-guided auto tour, established in 1988, has become a popular year-round attraction. Laborer Marlin French updated the trail leaflet and added 6 more stops in 1995. Some 400 pamphlets were dispensed from April to November. Future plans include changing the pamphlet seasonally.

6. Interpretive Exhibits/Demonstrations

Since the complex headquarters has been moved to Scottsbluff, the office no longer serves as a visitor contact station. The brochure rack and visitor register were moved into the arctic entry which is left unlocked.

7. Other Interpretive Programs

On Site

The Refuge provided tours to all who requested them. Oshkosh third grade has become an annual event and the days activities very structured. The Ogallala middle school brought 115 students to the Refuge for a tour. Denver Metro College was given a tour and talk. An NRCS employees group tour was provided.

Off Refuge

Talks were provided to the Western Nebraska Division Range Judging Contest, and the Alliance Rotary Club.

8. Hunting

In concert with the state seasons and regulations, the refuge hosts hunting seasons for four species of game: mule deer, white-tailed deer, sharp-tailed grouse, and ring-necked pheasant. Table 14 shows relative popularity and success for each season. Hunter visits are determined using traffic counters and the harvest figures are derived from wing and leg envelopes and check station results.

Table 14 1996 Hunter Activity

| Species | Seasons | Visits | Harvest |
|---|---|---|---|
| Prairie Grouse | Sept 14 - Dec 31 | 80 | 68 |
| R. necked Pheas | Nov 4 - Jan 31 | 40 | 50 |
| Deer (Firearm) | Nov 11- Nov 19 | 150 | 36 |
| (Archery) | Sept. 15 - Dec 31 | 30 | 1 |
| (Blk. Powder) | Dec 2 - Dec 17 | 30 | 3 |

Refuge grouse hunters are requested to complete a questionnaire and, if successful, deposit one wing from each bird harvested into collection boxes located at each of four entrances. Based on a total of 68 sharp-tailed grouse wings it was determined that refuge hunters harvested a ratio of approximately 2.0:1 juveniles to adult. The number of birds harvested decreased from the 71 sharp-tailed grouse harvested last year.

Harvest data was also collected via envelopes for ring-necked pheasant. Nearly identical to the grouse wing envelopes, refuge pheasant hunters are requested to answer several pertinent questions and deposit a leg from each bird into a collection box at the refuge entrances. This year's harvest totalled 50 pheasants. The juvenile to adult ratio was 1.6:1.

Crescent Lake is a big game check station for the State of Nebraska. In addition to the information required by the state, the refuge recorded age, and antler measurements of the harvested deer. Thirty-six (36) deer were harvested on the refuge during the November 11-13

firearm deer season. Of these, 13 were mule deer and 23 were white-tailed deer. Four of the deer harvested were does. The largest white-tail deer was a 5x5 with 18½ inch inside spread. The largest mule deer had a 4x5 rack and 19½ inch spread.

One mule deer was harvested on the refuge during the Nebraska archery season. Two mule deer and a white-tail were harvested during the refuge's black powder season.

9. Fishing

Island Lake is the only lake on the refuge open to fishing. Ice-fishing remains a popular pastime among the local folks and it is not unusual to see 25-30 ice fishermen enjoying this vigorous sport on any day of a winter week-end. Ice fishing is usually best from freeze-up until about the first of January. Fishing this fall came early when the lake froze and stayed that way in late November.

Year long, fishing activities in 1996 resulted in a fair harvest with major species taken being yellow perch, bass, and bluegill. Master Angler sized perch and bluegills are not uncommon in Island Lake. Fishing visits recorded for the year totalled 1,914.

A National Fishing Week event was held this year on June 8. The North Platte Valley Sportsmen provided instructors for several round robin classes, and several boats. After an hour of instruction, 19 new anglers were taken out in boats where they spent about three hours practicing what they had learned. The fish were cooperative and we didn't hear of anyone who didn't catch something. Then the participants learned how to prepare their catch and everyone had a sample of shoreline cooked fish.

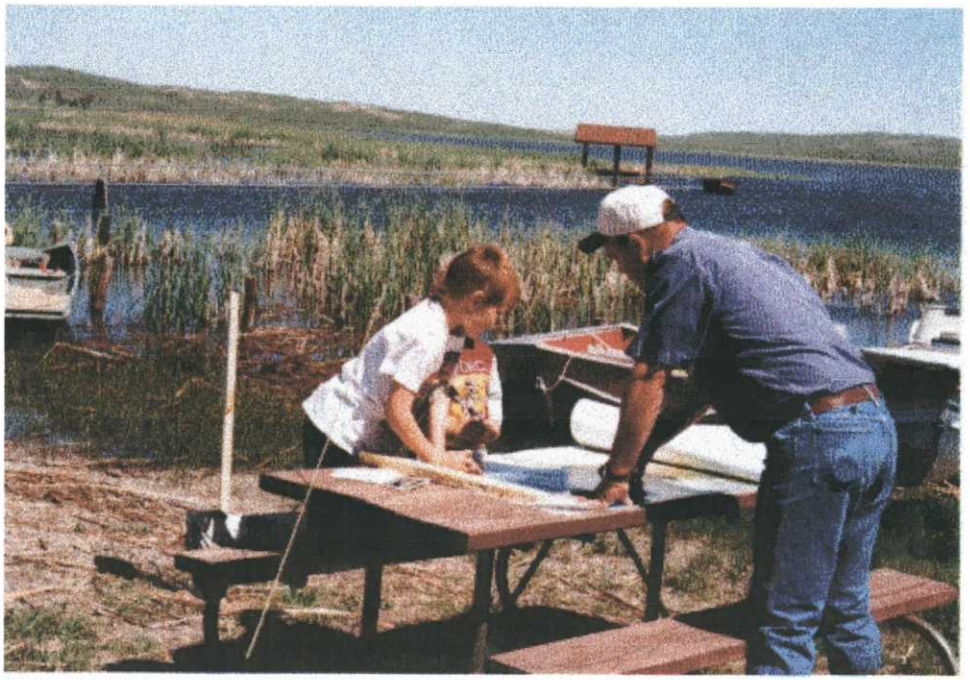


Figure 11. Local Conservation Officer Dan Evasco teaching fish species for the fishing week event. 96CRL11-WDB

An unsuccessful dredge was stripped of equipment and placed in Island Lake to provide a fishing float. We gained our first experience at jetting in pilings to anchor the barge. After we figured it out, the job went very well. Some sort of fishing access for the non-boater was critical because emergent vegetation makes the shoreline unfishable. Of the two piers built a few years ago, one was destroyed by ice and the other has been under water for 18 months.

Figure 12. French and Stopak jetting pilings on the new fishing float. 96CRL12-LKM

11. Wildlife Observation

A unique wildlife viewing opportunity at Crescent Lake NWR is the "dancing" of sharp-tailed grouse in the spring. The refuge maintains a blind on a sharp-tailed grouse dancing ground for public observation and photography. Viewing at the blind was better this year as grouse numbers appear to be increasing.

15. Off-Road Vehicling

Very few Sandhills roads are surfaced and while travel with almost any vehicle is possible over the better refuge roads, the side trails are most safely traveled with four-wheel drive vehicles. Four-wheel drive is required by regulation on most refuge sand trails. Trails that are open to the public are designated on the refuge map, signed and are mowed. Off-trail vehicling is prohibited. Trails were rerouted in several places again this year because too many people were getting stuck due to the high water.

16 Law Enforcement

Law enforcement efforts are concentrated on opening weekends of grouse, pheasant and firearm deer seasons with spot checks and weekend patrols conducted during the balance of the hunting and fishing seasons. A man and a woman were caught shooting a deer in the closed area and paid a total of $690 in fines. Citations were also written for running a gasoline powered motor on Island Lake, two for camping on the refuge, one unregistered vehicle, and three citations were written for hunting pheasants in a closed area.

Figure 13. This fellow was too much temptation for a pair of poachers who blasted him in the closed area. 96CRL13-MLS

Shaul and Behrends assisted North Platte NWR on summer holiday weekends. McKinney came from North Platte to help us for the deer opener.

Refuge officers attended the 40-hour in-service training seminar at the Federal Law Enforcement Training Center, Marana, Arizona in January and February. Refuge officers also attended the fall refresher at Fort Niobrara NWR in August and re-qualified with their weapons.

# I. EQUIPMENT AND FACILITIES

## 2. Rehabilitation

Fixtures were removed from one of the original restrooms in the office to make the space available for other uses.

Shaul spent two weeks at North Platte Refuge removing the old concession building.

## 3. Major Maintenance

Quarters 5 MMS project was not completed because of contracting difficulties. Due to changes in federal procurement law and the advent of "two-year" resource management funding, we were able to issue two purchase orders for accomplishment of this project. Work is scheduled to be completed by July 1, 1997.

Steel siding was installed on the north maintenance building force account. We hope to install steel siding on all the wood sided buildings eventually as fire protection and to end periodic paint jobs.

With the second maintenance position on the Refuge vacant for 16 months, the windmills were left turned off for the summer of '95. Late that summer our neighbors to the east got worried and asked if they could turn some of the wells on for fire protection. Because the position was still vacant this spring, and we didn't think the mills would survive being managed by neighbors with no thought of maintenance, we let a contract to turn on and do an annual oil change on all the Refuge windmills. The contractor worked on and off at the job all summer, and still didn't get all of them done. The vacant maintenance position was filled in August with Firefighter French on a TAPER appointment. Since then he has been working diligently to get the windmills out of the deplorable state into which they had fallen with just 16 months of neglect.

Rock was hauled from Bridgeport and placed on poor spots of the West Mail Road.

The D-7 crawler was hauled to North Platte for a track adjuster repair.

Several malfunctioning overhead and passage doors were replaced or repaired and automatic openers installed in the shop.

About 29 miles of boundary fence were checked, and signs replaced. Many of the boundary signs made by UNICOR were faded to white. It's hard to say when they were installed, but they are the newest style signs. The cost of signs is bad enough, but when you consider the labor involved in getting them installed, short life span signs are pretty costly.

4. Equipment Utilization and Replacement

After months of looking for surplus furniture, year end money was used to acquire basic furnishings for Q-6 and Q-4 so they can be more efficiently used to support research and other worthwhile projects sponsored by other entities.

A Dodge one ton was received to replace the fire truck at North Platte. It is being equipped here. The 85 Dodge it replaces was stripped of equipment for sale.

The old D-6 crawler was transferred to Colorado FWMAO. We hauled the Cat to them.

The utility bed was moved from an old Dodge pickup to the new Chevrolet which replaced it. An older 1978 Dodge was excessed.

A homemade dredge which was never made to operate successfully was stripped of equipment and the barge placed in Island Lake as a fishing float. It was placed at the north boat ramp where ice had destroyed the pier. The fishing pier at the south ramp has been under water for about 18 months now.

## J. OTHER ITEMS

### 1. Cooperative Programs

The refuge participated in several cooperative programs with various federal, state and local agencies. Most of the programs provided technical assistance to the respective agencies (Section E-7).

The refuge currently maintains six Memorandums of Understanding with local fire districts. These five year agreements provide for reciprocal, cost-free assistance in suppressing area wildfires (Section F-9).

### 4. Credits

Behrends -- Sections A-F parts of H and K
French -- Section G parts of H
Patrick – Editing and compilation

Photo credits are listed by each photograph. Photographers are as follows: LKM-Larry K. Malone; WDB-William D. Behrends; LEB-Loren Blake; MGF-Marlin G French; MLS-Monte L. Shaul.

# ANNUAL NARRATIVE REPORT

Calendar Year 1996

NORTH PLATTE NATIONAL WILDLIFE REFUGE

Minatare, Nebraska

INTRODUCTION

TABLE OF CONTENTS

# INTRODUCTION

The North Platte National Wildlife Refuge (NWR) was established by Executive Order No. 2446 in 1916 as a "preserve and breeding ground for native birds". The refuge was superimposed over four Bureau of Reclamation (Bureau) reservoirs and was subject to "Reclamation service uses".

Three of the four reservoirs are managed as separate units of the refuge; the Lake Minatare Unit, Winters Creek Unit (500 acres) and Lake Alice Unit (1,680 acres). The Little Lake Alice reservoir was dropped by Executive Order from refuge status in the early 1960s.

Originally the wildlife, fisheries, recreation and land management responsibilities were held by the old Bureau of Biological Survey. All units, with the exception of Lake Minatare, were closed to the public as a year-round refuge. The Lake Minatare Unit had a small year-round picnic area and was open to public recreation from May 16 to September 15 with the north half of the lake closed to boating. This management scheme allowed for fall concentrations of up to 200,000 mallards, 10,500 geese, and 24 bald eagles.

Over the years the Fish and Wildlife Service's (Service) involvement faded. In 1958 the Service reduced its closure to 107 days from October 1 through January 15. A "park" development map was prepared in 1937 with major development plans prepared in 1947 and again in 1963 covering only Lake Minatare. These plans were developed by the Bureau and emphasized recreational uses such as camping, boating, picnicking, swimming, seasonal cabins, etc. The 1963 development plan allowed the Nebraska Game and Parks Commission (the Commission) to assume control of recreation, fish and wildlife administration of certain areas, and to establish a State Recreation Area (SRA) on Lake Minatare. The Service had little influence on this plan, as was evidenced by the need to amend the agreement in 1963 to recognize the fact that the Service had responsibility for wildlife. During this same time the Bureau handled the other land management activities, which consisted of intense grazing.

The Service increased its presence in 1978 when a temporary intermittent employee was hired to post boundaries and conduct censuses on the Refuge.

In 1985 the Bureau "discovered" the 1976 Game Range Bill, which mandates that all NWRs under the Secretary of Interior be administered by the Service. An agreement was implemented in October 1985, replacing the Bureau with the Service as the primary jurisdiction agency.

In 1990, while under the auspices of the Crescent Lake/North Platte NWR Complex Project Leader, authorization was granted to hire the first-ever, on-site refuge manager.

In 1996, in order to alleviate numerous incompatible public use activities associated with the Lake Minatare State Recreation Area, a bill was passed through Congress which removed 2,470 acres from the National Wildlife Refuge System. The Lake Minatare Unit now consists of 617 acres of upland habitat.

## A. HIGHLIGHTS

The Service closed on the purchase of 16 acres adjoining the Winters Creek Unit. (Sect. C.3.)

Congress and the President passed and signed PL 104-212 removing the Lake Minatare State Recreation Area from the National Wildlife Refuge System. (Sect. E.8)

## B. CLIMATIC CONDITIONS

The year was wetter and cooler than the norm. Total precipitation for the year was 16.49 inches, 1.22 inches above normal (15.27). The average temperature was 47.4 degrees (F), a full degree below the normal (48.4). The growing season was marked with wide spread and damaging hail occurring on the 23rd and 30th of May.

## C. LAND ACQUISITION

### 3. Other

North Platte River Island Units - Nothing was furthered regarding the acquisition of two public domain islands. According to a Bureau of Land Management Realty Specialist, the Solicitor's Office has been instructed by the Justice Department to "sit on" the island cases until told otherwise. The Realty Specialist feels that the Justice Department will not act unless there is a pending court case regarding one or both of the islands. One of the islands, Morrill Island, is considered to be part of the National Wildlife Refuge System. Refuge Managers, having no access to the property, consider the dispute a "compatibility" issue.

Winters Creek Expansion - The Service closed on the purchase of 16 acres adjoining the Winters Creek Unit. After necessary "clean-up", the Bigsby tract will lend itself well to environmental education with its building sites and easy access to wetlands.

## D. PLANNING

### 1. Management Plan

A management plan was drafted and made a part of a draft Memorandum of Understanding (MOU) with the Bureau that, when ratified, will transfer to the Service land management responsibilities of 235 acres adjoining the refuge. The management plan and MOU are patterned after similar documents for Service management of Stateline Island.

## E. ADMINISTRATION

### 1. Personnel

Mike Happold, seasonal Range Tech/Firefighter, entered on duty April 8. Mike holds a BS degree in Natural Resources from the University of Nebraska - Lincoln. Mike was terminated November 15.

Mike Sarchet returned for his sixth consecutive season as Youth Conservation Corps (YCC) Crew Leader. Mike was terminated in early August after a very successful and accident-free season.

Monte Shaul, Heavy Equipment Repairer, was presented with a On-the-Spot cash award for an outstanding job serving as engineer and crew master in the construction of the Black WEA water-control structure.

Felix Koenig, Police Officer, was converted to a Biological Technician.

Figure 1. Lydia Patrick received two Special Achievement Awards during the year. In August, she was awarded by her supervisor for her efforts with several desk-top publishing projects. Lydia, as seen here, then received an award from Deputy ARD Susan Baker for superior field support. 96NPL1-BWM

2. Youth Programs

The 1996 YCC program consisted of a Crew Leader (Mike Sarchet)(with Range Tech Happold assisting) and seven enrollees: Amy Lawrence, Zachary Suhr (both Youth Leaders), Kassie Townsend, Aaron Wlaschin, David Rivera, Cindi Eitzman and Jamie Griffith.

The station received Regional funding for four enrollees. The station augmented the program with three additional positions using 1) station O&M funds, 2) through a partnership agreement with the National Parks Service, and 3) through a partnership agreement with the Bureau.

Projects accomplished through the YCC program included: painting raptor rehabilitation center and assisting with the construction of the aviary exhibit at Riverside Zoo, replacement of old timber steps with concrete steps along the "Awareness Pathways" at Wildcat Hills Nature Center for NGPC, participation in the second annual Nebraska Wildlife Habitat Evaluation Contest in south central Nebraska (a University of Nebraska event), painting projects for the City of Scottsbluff (as part of our outreach efforts), construction of watergap gates across Supply and Highline Canals, removal of interior fixtures of the old concession building in preparation of demolition, building fish habitat at Winters Creek Lake, removal of old boundary fence at Scottsbluff National Monument, construction of boundary fence at Stateline Island, and an educational field trip to several active archeological "digs" in eastern Wyoming.

Figure 2. YCC designed and constructed a boundary "fence" across the fluctuating Lake Alice outlet that will permit debris to flow downstream yet keep cattle out. 96NPL2-MTH

4. Volunteer Program

A refuge volunteer for the past eleven years, Lucy Koenig continues to assist with numerous projects such as fence repair, signing, and wildlife disease prevention and control. Of particular importance are her bi-weekly wildlife surveys and maintenance and surveys of artificial goose tubs (29) and wood duck boxes (73). During the nesting season, Mrs. Koenig enjoys spending a considerable amount of time monitoring and recording the progress and activities of the refuge's nesting bald eagles.

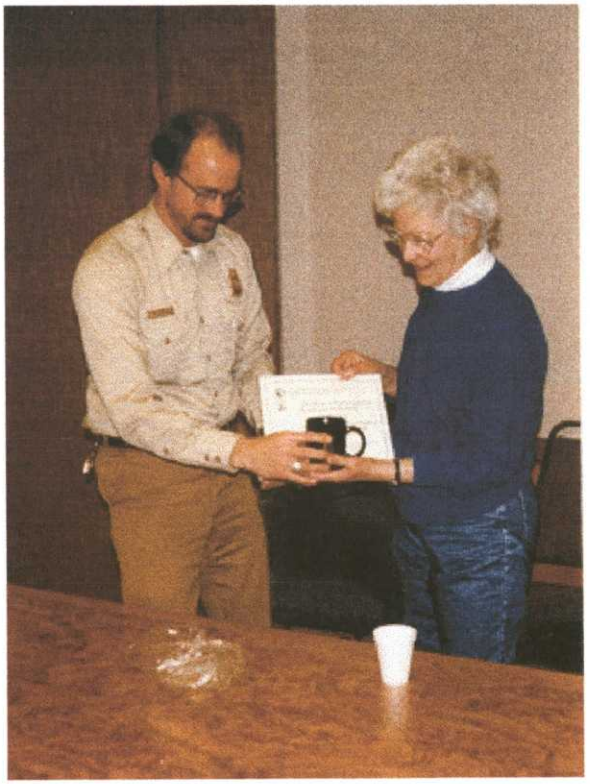


Figure 3. In February, Lucy was presented with a ten-year Service pin and certificate. 96NPL3-LKM

Don Reed, a retired biology instructor with Western Nebraska Community College, provided the refuge (Stateline Island Unit) with 80 hours of service in his third year as a refuge volunteer. Mr. Reed was involved with several self-initiated projects including; removing woody vegetation from a "lost" boundary fence, building brush piles ("bunny bunkers"), hand chopping noxious weeds, and tending to 150 newly planted saplings.

Titus Coop, Wildcat Hills Nature Center Naturalist, volunteered 8 hours of service posting the new Lake Minatare boundary.

Figure 4. In May, two science classes from Scottsbluff High School planted 130 trees (mulched and sheltered same) at Stateline Island. 96NPL4-BWM

Mike Sarchet volunteered 16 hours of service in December as a co-presenter at the "58th Midwest Fish and Wildlife Conference" in Omaha.

5. Funding

Was awarded Regional Challenge Grant funding ($2,500) to assist the Scottsbluff Public Schools Foundation in the production of a 3-day summer "science camp" for fifth-graders which highlighted the Winters Creek Unit wetlands.

Received a transfer of funds from the Bureau ($2,500) and the National Park Service ($2,000) to underwrite a portion of the YCC program.

An award of $2,225 from the Panhandle Math and Science Coalition for a grant proposal to produce the first ever Junior Duck Stamp Contest Workshop was issued to the co-sponsors, Educational Service Unit #13 (ESU #13) and the Service.

An award of $25,000 from the Environmental Protection Agency (EPA) for a grant proposal to develop an environmental education curriculum that will highlight and utilize public lands in the surrounding community, including units of the North Platte NWR, was issued to the Western Nebraska Environmental Education Network (Nature Network) an ad hoc group with representatives from ESU #13, Riverside Zoo, Scottsbluff Public Schools Foundation, and the Service. ESU #13 will be the receiving entity for the grant monies.

7. Technical Assistance

Refuge bi-weekly wildlife surveys for the year were submitted to the Nebraska Ornithological Union for inclusion in the *Nebraska Bird Review* as well as the National Audubon Society for inclusion in their *Audubon Field Notes*.

The first meeting of the Nature Network was conducted at ESU #13 on December 18. Twenty (20) teachers from seven schools (K-12) met with 15 Advisory Council Agency Representatives to discuss strategy and organization to further the environmental education curriculum project that will highlight local natural resource sites, funded ($25,000) by the EPA. The group was enthusiastic and united in their desire to see stated objectives met. This EPA grant was co-authored by this Station.

8. Other Items

After six years of struggling with compatibility issues surrounding the Lake Minatare SRA, such concerns were finally resolved with Congress and the President passing and signing Public Law 104-212 into law October 1. (See Figure 5) This legislation removed the SRA, some 2,470 acres, from the National Wildlife Refuge System. Refuge staff immediately signed and posted the new refuge boundary. A draft MOU was still being circulated between the Bureau and

Public Law 104–212
104th Congress

An Act

Oct. 1, 1996
[H.R. 2679]

To revise the boundary of the North Platte National Wildlife Refuge, to expand the Pettaquamscutt Cove National Wildlife Refuge, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

Nebraska.

# TITLE I—NORTH PLATTE NATIONAL WILDLIFE REFUGE

16 USC 668dd note.

**SEC. 101. REVISION OF BOUNDARY OF NORTH PLATTE NATIONAL WILDLIFE REFUGE.**

(a) TERMINATION OF JURISDICTION.—The secondary jurisdiction of the United States Fish and Wildlife Service over approximately 2,470 acres of land at the North Platte National Wildlife Refuge in the State of Nebraska, as depicted on a map entitled "Relinquishment of North Platte National Wildlife Refuge Secondary Jurisdiction", dated August 1995, and available for inspection at appropriate offices of the United States Fish and Wildlife Service, is terminated.

(b) REVOCATION OF EXECUTIVE ORDER.—Executive Order Number 2446, dated August 21, 1916, is revoked with respect to the land described in subsection (a).

Rhode Island.

# TITLE II—PETTAQUAMSCUTT COVE NATIONAL WILDLIFE REFUGE

16 USC 668dd note.

**SEC. 201. EXPANSION OF PETTAQUAMSCUTT COVE NATIONAL WILDLIFE REFUGE.**

Section 204 of Public Law 100–610 (16 U.S.C. 668dd note) is amended by adding at the end the following:

"(e) EXPANSION OF REFUGE.—

"(1) ACQUISITION.—The Secretary may acquire for addition to the refuge the area in Rhode Island known as 'Foddering Farm Acres', consisting of approximately 100 acres, adjacent to Long Cove and bordering on Foddering Farm Road to the south and Point Judith Road to the east, as depicted on a map entitled 'Pettaquamscutt Cove NWR Expansion Area', dated May 13, 1996, and available for inspection in appropriate offices of the United States Fish and Wildlife Service.

"(2) BOUNDARY REVISION.—The boundaries of the refuge are revised to include the area described in paragraph (1).

"(f) FUTURE EXPANSION.—

39–139 O - 96 (212)



"(1) IN GENERAL.—The Secretary may acquire for addition to the refuge such lands, waters, and interests in land and water as the Secretary considers appropriate and shall adjust the boundaries of the refuge accordingly.

"(2) APPLICABLE LAWS.—Any acquisition described in paragraph (1) shall be carried out in accordance with all applicable laws.".

**SEC. 202. AUTHORIZATION OF APPROPRIATIONS.**

16 USC 668dd note.

Section 206(a) of Public Law 100–610 (16 U.S.C. 668dd note) is amended by striking "designated in section 4(a)(1)" and inserting "designated or identified under section 204".

**SEC. 203. TECHNICAL AMENDMENTS.**

16 USC 668dd note.

Public Law 100–610 (16 U.S.C. 668dd note) is amended—

(1) in section 201(1)—

(A) by striking "and the associated" and inserting "including the associated"; and

(B) by striking "and dividing" and inserting "dividing";

(2) in section 203, by striking "of this Act" and inserting "of this title";

(3) in section 204—

(A) in subsection (a)(1), by striking "of this Act" and inserting "of this title"; and

(B) in subsection (b), by striking "purpose of this Act" and inserting "purposes of this title";

(4) in the second sentence of section 205, by striking "of this Act" and inserting "of this title"; and

(5) in section 207, by striking "Act" and inserting "title".

Approved October 1, 1996.



LEGISLATIVE HISTORY—H.R. 2679:
HOUSE REPORTS: No. 104–527 (Comm. on Resources).
CONGRESSIONAL RECORD, Vol. 142 (1996):
Apr. 23, considered and passed House.
June 27, considered and passed Senate, amended.
Sept. 17, House concurred in Senate amendments.

○



Figure 5. Public Law 104-212

the Service that will outline the new intra-agency working relationship in regards to the divestiture.

McKinney attended the State Coordination meeting with the Commission on March 14 and a briefing for congressional staff on the 15th. Attendees were brought up to date regarding the divestiture of Lake Minatare from the Refuge System.

In July, McKinney attended a two-day workshop in North Platte regarding wetland restoration/ creation, and private land project evaluation.

In August, Managers met with the Bureau's Ken Randolf, Chief of Water and Lands at their Mills, Wyoming office to discuss the framework for needed revisions to our MOU, in light of the divestiture of the Lake Minatare SRA.

Also in August, McKinney, Koenig, ARD Joe Webster and Deputy ARD Susan Baker participated in a tour, sponsored by Scottsbluff/Gering Chamber of Commerce, and Bureau's North Platte River Projects Office. The tour included stops at Seminoe, Pathfinder, Alcova and Glendo Dams/Reservoirs as well as the Fremont Power Plant and Mills Office Computer Control Center. Project Leader Malone joined the tour at the Whalen Diversion and continued on with onsite inspections of western Nebraska's irrigation facilities including the Inland Lakes (North Platte NWR). A great deal was learned about the balance and mechanics of storing and delivery of water to the appropriated users. The North Platte Valley Water Coalition sponsored this latter event.

McKinney and co-author, Mike Sarchet (local educator/YCC Crew Leader/Volunteer), were accepted as presenters at the *58th Midwest Fish and Wildlife Conference* in Omaha, December 8 - 11. Their presentation highlighted the need and suggested means by which natural resource professionals can become more aggressive, more actively involved in environmental education. The presentation was well received by the 35 professionals in attendance.

## H. HABITAT MANAGEMENT

### 1. General

Prior to 1986, habitat management was the responsibility of the Bureau. The management policies of the Bureau emphasized economic and/or recreation use (i.e. cabin leases, state recreation area lease, and intense, season long grazing). With the transfer of administrative jurisdiction to the Service, management has altered accordingly with wildlife, where possible, receiving primary consideration.

### 2. Wetlands

The two refuge impoundments (along with Little Lake Alice and Lake Minatare which make up the Inland Lakes) receive their water through a series of reservoirs in Wyoming and are managed exclusively for irrigation purposes. Waterfowl brood and marsh bird habitat is limited to two small seepage marshes and some of the more secluded bays of the reservoirs. By late summer, wide sand-flats typically surround Lake Alice and Lake Minatare as they near "dead pool".

Because of this dramatic fluctuation, aquatic vegetation does not exist in the Minatare or Alice reservoirs. Winters Creek Lake, however, is a natural wetland that was altered to serve as a reservoir. Consequently, an attractive mix of pondweed, bulrush, filamentous algae and cattail flourish in Winters Creek Lake.

All three reservoirs enjoyed above normal water storage levels during the summer months. In October, after the irrigation season had drawn to a close, the Bureau closed the Lake Alice outlet leaving approximately 1,000 acre-feet in storage ("excess to ownership"). This action on the part of the Bureau and Pathfinder Irrigation District over the past five years has been a big boon to waterfowl in contrast to prior years when the lake was drawn down to dead pool.

3. Forests

All lakes within the refuge boundary are at least partially surrounded by a belt of trees. A total of 355 acres are tree covered and about half of these areas serve as green tree reservoirs during (infrequent) full-pools.

5. Grasslands

Management objectives for refuge grasslands are to increase vigor and diversity of tall warm season native grasses to provide optimum waterfowl nesting habitat in the subirrigated meadows. Objectives for grasslands deemed low priority for waterfowl nesting are to enhance vigor and extent of native species and to create a diversity in grassland habitats to accommodate a variety of wildlife species.

About 1,500 acres of grasslands exist within the refuge boundaries. Historically, through 1985, the grasslands surrounding all three reservoirs were leased for season long grazing by the Bureau.

A grassland monitoring technique was initiated in 1988 to assist in the evaluation of the various habitat manipulation practices occurring on the Lake Alice Unit. The point-sampling method of Savory (1986) along with visual obstructions readings (VOR) and enclosures were expanded in 1990 to include the Minatare and Winters Creek Units. Such monitoring will be essential in documenting habitat response to management practices and environmental occurrences (drought, wildfire, etc.). In order to conduct such monitoring properly a great deal of expertise is needed in rangeland plant identification. This skill and interpretation of several subjective variables differ with each observer and continues to be a problem in search of a solution. Funding levels/staffing patterns were insufficient to conduct vegetative transects during the past five years.

7. Grazing

Several "permittee-friendly" adjustments were made to the grazing program in order to stimulate more outside interest: permittees were selected by bid in February (instead of March, historically) to allow more planning time, and Lake Alice was divided into 4 paddocks instead of 8 requiring less temporary fencing and fewer moves.

Dale Staman was issued a special use permit to graze the Lake Alice Unit (800 acres) for his high bid of $7/AUM. No bids were received for the Lake Minatare Unit. Stamen removed 78 AUM's between May 1 and June 15 using 43 C/c pairs and 2 bulls.

8. Haying

In conjunction with station integrated pest management needs, a permittee was sought to cut and bale hay from 15 acres within the Winters Creek Unit. By soliciting a cooperator to cut hay on this area after ground nesting season and prior to Canada thistle blooming, mowing costs have been saved as well as providing some hay (refuge share) for goose tub and trail maintenance.

No bids were received in 1996. This area was mowed, force account, in order to comply with State weed laws.

9. Fire Management

The City of Scottsbluff agreed to sign a cooperative agreement for fire suppression responsibilities at Lake Alice. (This is a rather unique situation in that Lake Alice lies within the jurisdiction of Scotts Bluff Rural Fire District which has refused to sign an agreement for over ten years and, at least verbally, have threatened not to suppress fires on refuge lands.) Several of the SBFD personnel have been red-carded through the Service in 1996 and will be available to assist with prescribe burns as well as wildfires.

Two prescribe burns within the Lake Minatare Unit were accomplished in the spring; a 3-acre burn along the

northeast corner, and a 30-acre burn along the western boundary. Scottsbluff City FD assisted with a 300-gallon tanker.

Refuge volunteer Rick Patrick passed the Step Test and was Red Carded. Mr. Patrick is a Research Technician with the University of Nebraska-Research & Extension Center and a former Range Tech/Firefighter with the Service.

A wildfire, started from burning debris on private land, burned onto the Winters Creek Unit (1 acre) in April. Damage was caused to the Commission's fish screen. The fire also destroyed a dilapidated, summer home on private land.

In May, the Refuge provided mutual aid to the Minatare Fire Department for a structural fire located 1.25 miles off-refuge. The house, a double-wide, and all contents were completely destroyed. While two youngsters had been left unattended at the home prior to the electrical fire, they were able to escape injury.

Range Technician Happold was called away on August 23 to join the Fire Strike Force Team stationed out of eastern Montana. This assignment lasted 21 days.

Firefighters Malone, McKinney and Happold assisted Scotts Bluff National Monument with a 180-acre prescribe burn on September 24.

Two small fires were suspiciously ignited on the Lake Minatare Unit over the course of several days in October. Fires were suppressed by Minatare Volunteer Fire District.

10. Pest Control

The refuge provided the Scotts Bluff County Weed Board with a letter of endorsement for their grant application to purchase and release biological control agents (insects for Canada thistle) along the North Platte River. Their grant was approved.

Happold was certified in chemical application through the county extension office.

Furnished Farmers Irrigation District with 5 gallons of 2,4-D ("Formula 40") for the control of noxious weeds at Stateline Island according to the management agreement.

Several hundred staff hours were expended eradicating Russian olive during the late-summer, early-fall. A combination of control efforts are being used; mature trees are being cut with "Arsenal" immediately sprayed on the basal cut, and suckering regrowth from last year's control efforts are being treated with a combination of 2,4-D and "Roundup".

12. Partners-for-Wildlife

Work efforts were completed during the year under a PFW agreement with Dr. Bill Black. Monte Shaul (CRL) spent two weeks engineering the project - viewed as highly successful by all involved. (See following page for further descriptive highlights.)

A PFW agreement was consummated with Dr. Clyde Kleager with the placement of three goose tubs and two wood duck boxes on wetlands along Spring Creek.

A PFW agreement was consummated with Dr. David Holdt with the delivery and installation of artificial nest structures along portions of Tubbs Spring Creek.

The Aratani WEA was terminated by refuge managers 8 months prematurely as a result of grazing trespass of the area in breach of agreed to terms.

## G. WILDLIFE

1. Wildlife Diversity

Refuge-wide, bi-weekly wildlife censuses are conducted by refuge volunteer Lucy Koenig and used to provide use-day numbers, migration chronology, and production estimates for indigenous species.

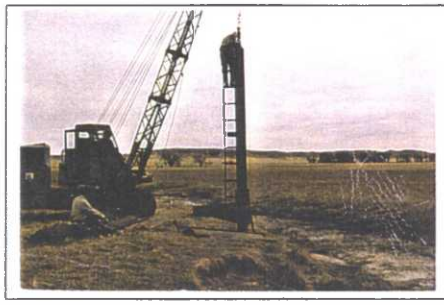
Partners for Wildlife

Contact: Larry Malone (308) 635-7851

November 1996

# Wetland Restoration in Western Nebraska

The Spotted Tail Creek headwaters is a 40-acre boggy grassland. The landowners wanted to improve waterfowl habitat in a way that would not diminish the land's value as pasture.

In April 1996, U.S. Fish and Wildlife Service personnel built a water-control structure, designed in partnership with the Natural Resources Conservation Service.

Nine-foot sheet pilings were driven into the ground across a fifty-foot wide drainage outlet. The pilings intercept groundwater, keeping it from flowing out.

A four-foot tall weir was then cut and capped, limiting the ponded area to four surface acres.

The landowners' goal is realized: waterfowl habitat is improved with minor disruption to livestock management. The result is a picture perfect partnership that will benefit wildlife for many years to come.

2. Endangered and/or Threatened Species

A black-footed ferret skin was destroyed because it was received in unusable condition for taxidermic purposes.

Nesting pair of bald eagles began incubating eggs in March - fourth year running (yawn). The nest produced two young which were reared to flight stage.

A peak population of 21 bald eagles was recorded on December 31. Bald eagles generated 1,910 use days for the year.

3. Waterfowl

Refuge waterfowl use days during 1996 relative to previous years, are shown as follows:

| | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|
| Am coot | 86,310 | 135,390 | 177,155 | 64,965 | 133,400 | 132,180 | 77,495 |
| Can geese | 1,451,850 | 673,200 | 388,175 | 293,455 | 137,190 | 476,550 | 178,015 |
| snow geese | 16,500 | 6,555 | 17,365 | 77,250 | 4,560 | 7,890 | - |
| ducks | 3,589,860 | 3,175,215 | 3,406,469 | 1,243,665 | 963,000 | 2,4166,920 | 1,180,820 |
| TOTAL | 5,144,280 | 3,990,360 | 3,989,164 | 1,6779,325 | | | |

Based on wood duck box inspections (83 boxes available) and mid-July brood surveys, the following waterfowl production numbers were recorded for the refuge:

| | broods | young |
|---|---|---|
| wood duck | 22 | 165 |
| mallard | 8 | 46 |
| | | 211 |

Seventy-six percent (76%) of refuge maintained goose tubs (26 of 34) were utilized in 1996. Based on tub inspections, 110 Canada geese were produced.

4. Marsh and Water Birds

Use days recorded during 1996 totaled 43,550 generated primarily by double-crested cormorant, sandhill crane, white pelican, western grebe, great blue heron and pied-billed grebe.

5. Shorebirds, Gulls, Terns and Allied Species

Shorebirds and gulls take advantage of the vast mudflats available throughout the summer and fall as reservoir water levels subside to meet irrigation demands.

Use days recorded during 1996 totaled 94,615 generated primarily by ring-billed gulls.

6. Raptors

Raptors common to the refuge include: great-horned owl, American kestrel, rough-legged hawk, golden eagle, red-tailed hawk, northern harrier, and osprey. Such generated a total of 1,515 use days during the year.

An electrocuted golden eagle was retrieved from a farm south of Dix, Nebraska. The ES office (Grand Island) was alerted for further follow-up with the power company.

Acting on a landowner's call for assistance, a sickly young Ferruginous hawk was captured in a hay field near Chimney Rock and delivered to Riverside Zoo's rehab facility. The hawk died within a few hours. Pesticide poisoning is suspected.

Wood duck boxes were inspected for screech owl use.

8. Game Mammals

The refuge deer herd is estimated to be 50-60 mule deer and 10 white-tailed deer.

A refuge-first occurred in September with the sighting of a bull elk on the Lake Alice Unit. Several neighboring ranchers and an irrigation district employee observed the

animal in the area. Managers found tracks of the elk on the Unit.

10. Other Resident Wildlife

Ring-necked pheasants, sharp-tailed grouse and bobwhite quail occur in small numbers on the refuge, primarily on Lake Alice and Winters Creek Units. A healthy population of wild turkey inhabit the Stateline Island Unit.

Common mammals on the refuge include raccoon, striped skunk, coyote, red fox, eastern fox squirrel and eastern cottontail. Two black-tailed prairie dog towns are located at Lake Minatare on the eastern and southwestern corners of the Unit.

In April, a mountain lion was hit by a train between Morrill and Mitchell and decapitated. The lion carcass was transported to the Commission District I Office in Alliance by refuge personnel. In the past several years, mountain lion sightings in the area have increased dramatically.

A 100+ acre prairie dog town, along the eastern boundary of the Lake Minatare Unit has sustained a die-off. Managers first began noticing a possible decline in the dog population last year. Walking through the site, with Dallas Virchow, UNL Animal Damage Control Specialist in August, managers were unable to locate any active burrows. Virchow suspects a plague die-off and will alert State Public Health officials of the possibility.

11. Fisheries Resources

Fisheries management at Lake Minatare is, by Memorandum of Agreement, the responsibility of the Commission. During the summer, the lake generally provides good fishing opportunities with good access and facilities. Lake Minatare harbors a healthy population of walleye, white bass, yellow perch, channel catfish and northern pike.

Lake Alice is generally lowered to dead pool each fall. Such practice thwarts sport fisheries management. Fishing, while permitted, is limited to harvesting only those fish

that enter the lake in the spring via the irrigation canal; primarily carp.

Refuge staff began work on a fisheries improvement project at Winters Creek Lake designed by the Commission. Russian olive slash is being anchored along the western shoreline where natural submergent vegetation is lacking. The *Star Herald* was on hand and published a front-page story of the project.

In October Lake Minatare was sampled by the Commission with gill nets for walleye age-growth data. Lake Minatare remains very constant from year to year. Almost no walleye ever reach 20 inches. It takes approximately 2½ years for walleye to reach the legal length of 15 inches. It will take another 1½ years for the fish to reach 20 inches. During this time there is enough fishing pressure to ensure that very few ever reach 20 inches.

Winters Creek Lake was netted by the Commission in early April for the purpose of removing some of the stunted yellow perch. In one week we were able to remove 739 pounds of perch. This was a total of 6,430 fish. All were hauled to Lake Minatare and stocked there. This perch removal had a very positive effect on the lake as the fishery the following fall and winter resulted in a harvestable size yellow perch for the fishermen.

Winters Creek Lake was also one of a number of lakes across the state that participated in a statewide bass-bluegill study. The lake was electro-fished at night in the early summer after the water temperature had reached 60°F. In an actual shocking time of 1 3/4 hours we had a catch rate of 23 fish per hour. This wasn't considered too good, however, the size of the fish collected wasn't bad. Eleven (11) fish were in the 200-299 mm range, 19 in the 300-379 mm range and 11 fish in the 380-509 mm range. The bluegill were captured during the same time period. This was very disappointing. Eight frame nets were fished over night with a result of a catch rate of 4.4 fish per net. All 35 fish were in the 150-199 mm range.

Winters Creek Lake was also involved in the statewide walleye study. Even though the catch rate was low (10.5 compared to 17.5 at Lake Minatare) over 25% of the fish were between 510-629 mm as compared to less than 2% for Lake Minatare.

Fish stocked in these two lakes in 1996 included 11,750 1" walleye stocked in Winters Creek Lake in June. Because of a boo boo, an additional 6,547 3-4" walleye were also stocked here in September. This lake also received 1,175 9-10" catfish in September.

Lake Minatare received 210 adult gizzard shad in May, 112,900 1" walleye in June and 5,000 9-10" channel catfish in September.

The fish screen at the inlet of Winters Creek Lake was damaged by a wildfire and disabled. Unknown amounts of rough fish entered the lake during several months as water was being diverted in.

Refuge staff assisted Commission Fisheries Biologists and West Nebraska Sportsman Association members with the retrieval and restocking effort of approximately 9,000 sports fish captured from below the Lake Minatare outlet (a necessary project after each irrigation season).

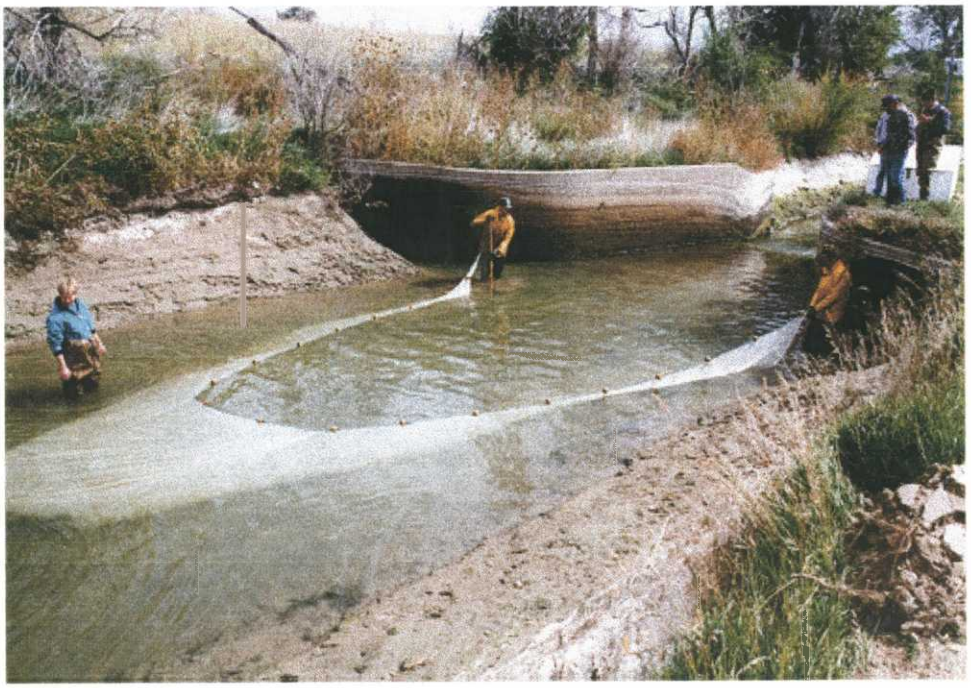


Figure 6. West Nebraska Sportsman's Association and Commission employees conducting the annual fish "salvage" project on Lake Minatare. 96NPL6-BWM

16. Marking and Banding

Refuge staff assisted NGPC with the banding of 345 Canada geese captured at Lake Alice in June.

17. Disease Prevention and Control

An avian cholera outbreak carried over into the new year at a wetland area (Spring Creek) west of Scottsbluff. Nearly 2,000 waterfowl, primarily mallards, died. Several hundred of these birds were frozen into the ice and were not retrievable. The majority were collected and incinerated. Commission employees are active partners in such clean-up efforts. The National Wildlife Health Center was apprised continuously.

## H. PUBLIC USE

### 1. General

As a result of the divestiture (Sect. E.8.) whereby the Service relinquished lands utilized by the Commission in the management of the Lake Minatare SRA, the refuge now actively manages public use on 617 acres around the lake that were found to have moderate to high wildlife values. Refuge acreage will now be managed for wildlife values and for wildlife oriented recreation. During 1996, the new refuge boundary was posted and, where necessary, fenced. As with the other three refuge units, wildlife oriented recreation is limited to daylight hours.

The Lake Minatare SRA receives an annual visitation of 150,000 to 250,000 visits. The state requires the purchase of a park permit in order to use the area. Problems that occur on the SRA are generally associated with off-road travel, uncontrolled camping (open fires and litter) and alcohol consumption. Public entry into the Lake Minatare area (both SRA and refuge lands) during the period October 1 to January 15 is prohibited.

Winters Creek Unit is a day-use area and public use is limited to such wildlife-oriented recreation as; fishing, wildlife observation, photography, hiking and non-combustionable boating. No beaches or campsites are available. The area is closed to public entry during the period of October 1 to January 15.

The Lake Alice Unit is also a day-use area with public use limited to the same pursuits as Winters Creek. These activities are allowed on the eastern half of the Unit during daylight hours only. The western half of the Unit remains closed to all public entry year-round. The entire Unit is closed to public entry from October 1 to May 15 to provide an undisturbed sanctuary during waterfowl migration periods and production period of marsh and water birds.

Stateline Island Unit is a day-use area open year-round to hiking, fishing the North Platte River, photography and nature observation.

As a result of the divestiture the refuge drafted and published a new public use leaflet in 1996. A new station bird list was produced in-house during the year, using desk-top publishing software. Thirty-seven (37) new species were added to the old list as well as text revisions and changes to seasonal observation data.

In celebration of National Wildlife Refuge Week, the Refuge hosted the 2nd annual Nature Walk through the Stateline Island Unit in November. Thirty (30) visitors joined refuge managers for a casual 2-hour stroll highlighting the unique riparian habitat.

In October, the Educational Service Unit #13 (ESU#13), in partnership with the Crescent Lake/North Platte National Wildlife Refuge Complex, initiated the "Conservation Through Art: Environ-Art" project. Funding for the project was made possible through the Panhandle Math and Science Coalition with in-kind contributions made by the U. S. Fish and Wildlife Service and others.

The Environ-Art project was a three-phased event. The first of three activities was conducted October 23 with 50 teachers from the community invited to attend a 2.5 hour workshop at the Wildcat Hills Nature Center. Attendees were introduced to the concept of conservation through art by numerous presenters: Penny Businga/Titus Coop/Anne James (ESU#13), Larry Malone/Brad McKinney (USFWS), Tom Samson (duck carver/artist), Mary Hunt (artist), and Barry Lee (artist).

Each teacher attending the workshop was given a copy of the video, *Conservation Through the Arts*, and an accompanying Jr. Duck Stamp curriculum guide courtesy of the Service. Teachers were asked to show the video to their class in preparation for the second Environ-Art activity; the classroom visit.

During the month of November, Naturalist Titus Coop and Artist Mary Hunt visited some 35 schools throughout western Nebraska and eastern Wyoming. The Coop/Hunt team reached over 1,500 students ranging from 1st through 12th grade. Students, using a "grid-system" technique, learned to draw a

mallard drake while receiving instruction in field mark identification, shapes and proper wildlife habitat.

The third and culminating event was a half-day workshop for young artists wishing to further develop their artistic skills, learn more about wildlife and their habitats, and initiate an entry into the 1997 Nebraska Jr. Duck Stamp Contest. (See Figure 7) On December 7, morning and afternoon workshops were offered (and limited) to fifty students each. Students were instructed in sculpting techniques by Carver Tom Samson and wildlife photography skills by Photographers Tom Downey and Gordon Rock. These professionals did an outstanding job of integrating scientific knowledge with artistic skills: What habitat type will you find a wood duck in; What kind of prey might you want to mimic if you're trying to call in a fox to photograph; What season of the year do ducks have their brightest colors and why, and why is this important to an artist?

Ms. Hunt wrapped up the workshop and the Environ-Art project with a final exercise in art technique that led to the initiation of a Jr. Duck Stamp entry for many of the participants.

Numerous individuals loaned taxidermy mounts and *Cabela's Inc.* loaned 40 working waterfowl decoys for use as models. The Jr. Duck Stamp Office (USFWS) in Washington, D.C. shipped out the traveling duck stamp exhibit compiled of "Best of Show" entries from all 50 states which were displayed during the final workshop.

The public was invited to attend the fourth-annual, Wildlife Watch at Lake Minatare on November 23. Twenty-five (25) visitors braved frigid temperatures to see the large concentration of waterfowl and eagles using the area (normally closed to the public). While the media did not promote our news release (for whatever reason) prior to, they did cover the event well after-the-fact.

2. Outdoor Classrooms

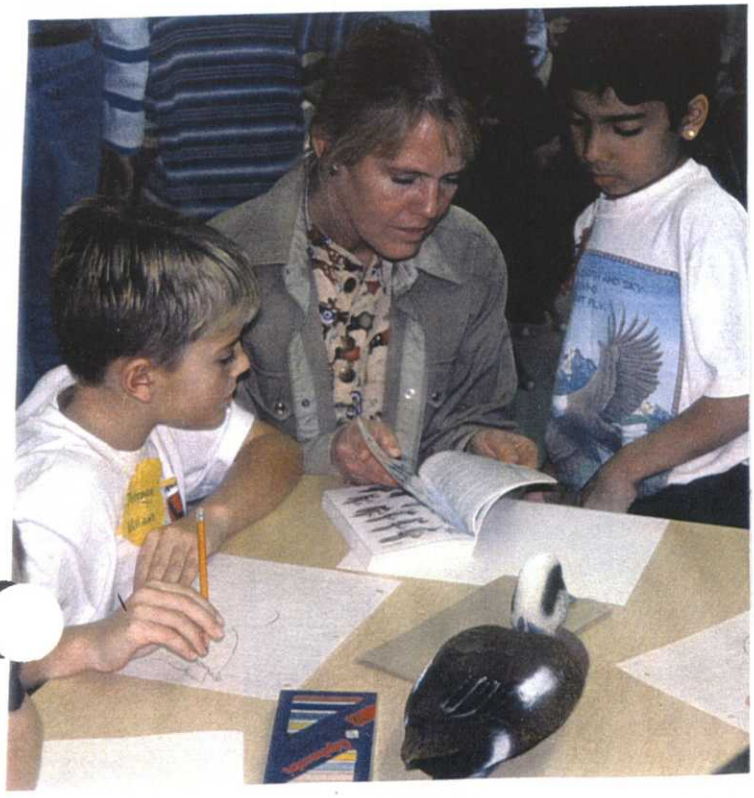
In June, the refuge hosted one day of a three-day science camp for area fourth and fifth graders. Winters Creek Unit was the site used by 120 students studying wetland wildlife habitat. Groups of 16 students rotated through four different stations where they studied orienteering, constructed a herbarium, learned beginning bird-watching techniques and observed lake invertebrates through "glass" bottom buckets. Area teachers coordinating the "camp" were pleased with the event. (This SCAMP event received partial funding through a Service Challenge Grant of $3,000.)

Figure 8. "Glass" bottom buckets provide SCAMP students with a means of exploring the lake's water column. 96NPL8-BWM

6. Interpretive Exhibits and Demonstration

Winning entries for Nebraska's 1996 Federal Junior Duck Stamp Contest, on-tour throughout the State, were received and put on display at the new Wildcat Hills Nature Center.

# The Student/Artist Workshop



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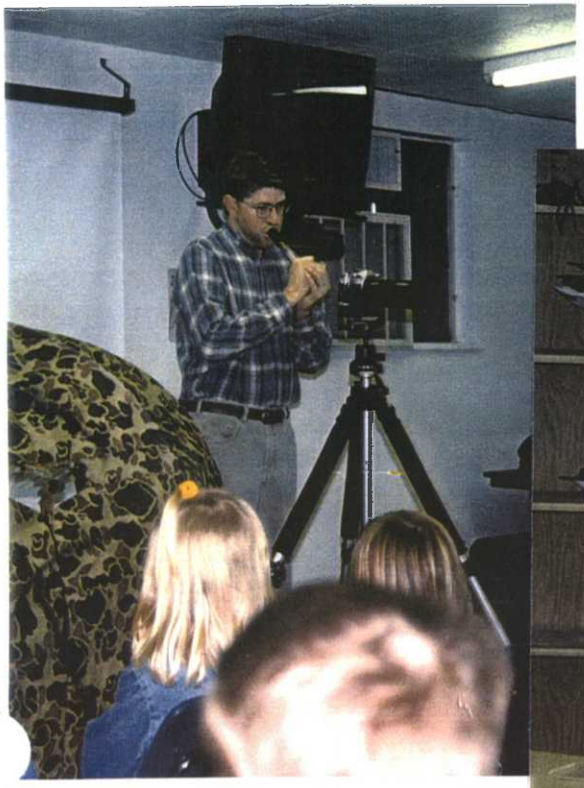

Community interest in the display and media coverage of the event were strong.

7. Other Interpretive Programs

In January, McKinney discussed with Gering 7th graders enrolled in a special civics class the importance of volunteering in their community. Several refuge projects were cited.

McKinney attended a Project Wild Workshop for Trainers offered by the Commission.

In April, refuge staff presented eight programs to a total of 220 fifth graders from throughout the Panhandle at an all-day workshop held at the Scotts Bluff County Fairgrounds. The "Water Wonders" event was sponsored by the Nebraska Department of Education and included "hands-on" exhibits by 18 conservation and/or water related organizations. The refuge presentation included a wetlands "trivia" game.

In May, refuge personnel participated in a "Branch Out" event for 200 fifth graders and 135 sixth graders at the Wildcat Hills Nature Center. Participants included the Commission, ESU #13, North Platte NWR, University of Nebraska - Extension, and Riverside Zoo.

In October, an in-class program was presented to 55 fourth graders (Longfellow Elementary) concerning wildfires.

Longfellow Elementary Principal, Patricia Gritzfeld reported the successful participation of her school in the "Wild Wings: Heading South" electronic field trip to Bosque del Apache NWR on November 20-22. This station had nominated Gritzfeld's school for participation at no cost.

9. Fishing

Fishing is permitted on all three reservoirs, however, only Lakes Minatare and Winters Creek have viable fisheries. Fishing pressure on Winters Creek Lake continues to grow.

Fishing along the shoreline of Stateline Island (North Platte River) is also permitted.

13. Camping

Camping is permitted at the Lake Minatare SRA. Indiscriminate camping continues to be a problem with heavy use denuding long stretches of lakeshore. While 52 camping pads are available, each with electricity, the public finds it more attractive to camp free elsewhere around the lake.

17. Law Enforcement

During 1996, 126 violation notices were issued by Commission and Refuge Officers:

| | alcohol related | traffic | boating | fishing | drugs | weapons | others |
|---|---|---|---|---|---|---|---|
| # of NOVs | 37 | 37 | 20 | 26 | 2 | 2 | 5 |

Since 1986, the presence of Refuge Officer Koenig has helped restore compliance with refuge rules and regulations. He has also served as the primary source for disseminating information to the visiting public.

A Refuge Officer attended most of the monthly law enforcement coordination meetings conducted with all area agency leaders.

The Complex utilizes the City of Scottsbluff Police Department's outdoor and indoor firing range.

## I. EQUIPMENT AND FACILITIES


Figure 9. The former concession building was razed following contractual removal of asbestos. NGPC is considering building a visitor center on the site and has asked the Project Leader for means of securing Service contributions for shared space in the new facility. 96NPL9-BWM

Duane Huber (Rainwater WMD) tested the Bigsby buildings for asbestos.

Figure 10. Felix Koenig, Bio Tech, keeps refuge equipment and facilities maintained and in good repair (and serves as judge/jury when you mess things up!) 96NPL10-BWM