

VALENTINE NATIONAL WILDLIFE REFUGE

Valentine, Nebraska

Annual Narrative Report

Calendar Year 1995

## **INTRODUCTION**

Valentine National Wildlife Refuge (NWR) was established on August 4, 1935 under the Migratory Bird Conservation Act by Executive Order 7142. The purpose of the refuge as stated in the executive order is “as a refuge and breeding ground for migratory birds and other wildlife.” Acquisition funding came from Duck Stamp sales and the Emergency Conservation Fund Of 1933.

The 71,272-acre Valentine NWR is located in the Sandhills of north-central Nebraska. The Sandhills contain the largest remaining stands of mid and tall grass native prairie left in North America. The refuge is a unique and ecologically important component of the National Wildlife Refuge System. The refuge has about 49,000 acres of grassy, undulating sand dunes, 13,000 acres of sub-irrigated meadows, and 10,000 acres of shallow lakes and marshes. The refuge is home to 270 species of birds, 59 species of mammals, and 22 species of reptiles and amphibians. The refuge is important to nesting and migrating waterfowl and is also one of the few places where good numbers of sharp-tailed grouse and prairie chickens can be found in the same area.. Several threatened or endangered birds stop at the refuge during migration. Two listed plants and one listed insect are also found here. Most of the native flora and fauna found here historically are still present today.

The refuge is part of a complex administered from Fort Niobrara NWR. Valentine NWR is in Cherry County with a subheadquarters located on Hackberry Lake, 17 miles south of the town of Valentine on US 83 then 13 miles west on State Spur 16B.

A. HIGHLIGHTS

Larry Vaughn retired on January 3 after more than 30 years of service at both Fort Niobrara and Valentine National Wildlife Refuges. Larry started at the Fort in 1962 as a seasonal employee where he worked on the buffalo and Texas longhorn roundups and sales. In the winter and spring he worked for fisheries services and put up hay on contract for the refuge. In 1976 Larry moved to Pony Lake on Valentine National Wildlife Refuge and started work as a Biological Technician. As a biological technician he worked in refuge grassland management, law enforcement, fisheries, wildlife surveys, and maintenance. He also worked the spring and fall buffalo roundups and annual sales. Larry's hard work, dedication, positive attitude, experience, knowledge, companionship, and commitment to wildlife conservation will be missed at the refuges.

Larry and his wife Ann raised two daughters, Gwen and Leanna, at Pony Lake and have a special fondness for the area. They enjoyed living there, raising a family, and being a part of the neighborhood.

B. CLIMATIC CONDITIONS

The staff of Valentine NWR have maintained a weather station at Hackberry Headquarters in cooperation with the National Weather Service since 1936. Total precipitation recorded in 1995 was well above the long-term average for the station, with adequate moisture was received throughout the growing season (Table B1).

---

Table B1. Weather data recorded at Hackberry Headquarters, Valentine NWR during 1995. Information includes monthly precipitation (rain and melted snow), evaporation, and net moisture (precipitation - evaporation); the monthly minimum and average low, monthly maximum and average high temperature, and the monthly record temperature extremes.

<u>Month</u>	<u>Precip</u> <u>(in)</u>	<u>Snow</u> <u>(in)</u>	<u>Evap</u> <u>(in)</u>	<u>Temperature (°F)</u>				<u>Record Temperatures (°F)</u>			
				<u>Mi</u> <u>n</u>	<u>Ave</u>	<u>Max</u>	<u>Ave</u>	<u>Low</u>	<u>Year</u>	<u>High</u>	<u>Year</u>
Jan	0.01	--		-8	14	56	37	-38	1894	70	1974

Feb	0.48	2.5		-5	19.1	70	44.3	-37	1899	76	1982
Mar	1.94	6		-10	--	74	46.5	-28	1948	87	1946
Apr	4.63	27.5	1.01	17	28	66	48	-8	1936	97	1992
May	6.28		2.09	32	40	80	59	17	1909	102	1934
Jun	4.09		5.32	35	51.7	88	74.3	30	1973 <sup>a</sup>	107	1937
Jul	3.19		7.43	48	57.8	100	84.8	38	1971	111	1990
Aug	1.63		5.65	44	59.4	99	86.9	34	1935	108	1947 <sup>a</sup>
Sept	1.93	3	3.69	23	46.5	90	72.3	12	1926	103	1952
Oct	3.38	12.5	.96	20	34.6	85	59.2	-6	1925	96	1922
Nov	0.3	2.5		0	22.7	67	47.4	-36	1887	82	1965 <sup>a</sup>
Dec	0.2	3.5		-14	14.6	61	37.7	-34	1907	76	1936
<b>Total</b>	<b>28.06<sup>b</sup></b>	<b>57.5</b>	<b>25.88</b>								

<sup>a</sup> Most recent year observed

<sup>b</sup> Average annual precipitation for Valentine NWR weather station is 21.74" from 1945-2000.

## C. LAND ACQUISITION

### 2. Easements

Information on easements not yet filed is found in this section. For information on easements where filing is complete see section F-13. Information on the Tower WMA and easement are found in the Tower WMA narrative.

An easement has not yet been filed on the Haskel FmHA easement. FmHA is selling the land back to the original owner under a lease back/buy back program. Our easement is part of the lease agreement with the buyer. The easement will be filed in 1998. The easement has about 364 acres which have an easement with haying and grazing restrictions and 100 acres with no restrictions.

The Haskel FmHA easement was visited during the year and plans were made with the landowner for fencing of the easement. Materials were ordered and a requisition prepared for the labor. The contract was let for fencing the easement. Unfortunately portions of the area to be fenced were under water and some of the monuments could not be easily located. After muck looking

the corners were found, materials hauled, and it looked as if we might get the fence up. The contractor, however, did not complete any work on the fencing of the easement before freeze up. He was sent an extension and hopefully will get the work done in the spring of 1996.

The Larsen easement in Knox County was not visited this year. FmHA is selling the land back to the original owner under a lease back/buy back program. The terms of our easement are included in the lease. The easement will be recorded in 1998. The 280 acre easement has not been surveyed or posted.

The 180 acres of land in the Johnson FmHA easement was transferred to the Fish and Wildlife Service in fee title during the year. The transfer had been held up by designation of the farmstead buildings as historical. FmHA paid for recordation of the farmstead. Basically the buildings were photographed, measured, and described. The work was done by a contractor. Supposedly now that this process has been completed we can sell or destroy the buildings.

One of the Wetland Reserve Program properties that we reviewed in 1995 was signed up. The 85 acre parcel has excellent wetlands in an abandoned center pivot field that was choked full of waterfowl when we visited it. Gene Mack, from the Sandhills program, did the evaluations of WRP intentions in 1995.

Asst. Manager Lindvall attended the Wetland Reserve Program meeting in N. Platte on May 16. Significant changes are that it is now an all NRCS program, there will be a possibility of 30 year easements, and the upland/wetland ratio can now go to 50/50.

## F. HABITAT MANAGEMENT

### F. HABITAT MANAGEMENT

#### 1. General

The 72,772 acre Valentine NWR lies at the heart of the Nebraska Sandhills. These grass-stabilized sand dunes provide some of the best native mixed- and tallgrass prairie remaining in the U. S. The refuge contains rolling, vegetated sand dunes and interdunal valleys that characterize the Sandhills region. Shallow lakes and wetlands are interspersed throughout the valleys, grading into subirrigated meadows. Sandhills and choppy sandhills range cover about 49,000 acres. Native grasses provide the dominant vegetation cover, although small areas have been invaded by Kentucky bluegrass and smooth brome. Other exotic plants of concern include small areas of leafy spurge, Canada thistle, and spotted knapweed. Grassland management is accomplished using permittee grazing and haying, prescribed fire, rest, and weed control.

### 3. Wetlands

There are 37 major wetland/lake areas on Valentine NWR that comprise about 13,000 acres. Lake elevation has been recorded at seven refuge lakes since 1988, and readings from 1995 indicate that lake levels are at or slightly above the yearly averages over the last 14 years (Table F 1).

---

---

Table F 1. Lake elevations on Valentine NWR in 1995.

<u>Lake</u>	<u>Average Elevation 1994</u>	<u>Average Lake Elevation 1988-2002</u>
Clear	2917.70	2917.29
Dewey	2924.47	2923.91
Hackberry	2925.19	2924.84
Pelican	2943.46	2942.76
Watts	2924.20	2923.92
Whitewater	2928.95	2928.24
Willow	2914.29	2914.84

---

---

There are 32 ground water monitoring wells located on and adjacent to Valentine NWR. These wells were established in the 1950's by the USDI-Geological Survey, and have been monitored twice annually by refuge staff since 1970. Spring and fall groundwater elevations for 1995 are presented below (Table F 2). Groundwater levels in 1995 were generally higher than the average levels measured from 1970-2002.

---

---

Table F 2. USGS groundwater monitoring well readings for 1995, and average values from 1970-2002. Data are groundwater elevation above sea level (ft), except for wells 17, 31, and 35; baseline elevations of these wells are unknown. For these wells, measured depth to groundwater was subtracted from 100 ft as an index of groundwater elevation.

<u>Well No.</u>	<u>Well Location</u>	<u>Spring 1995</u>	<u>Fall 1995</u>	<u>Spring Ave</u>	<u>Fall Ave</u>
1	N. East Long	2876.43	2873.23	2874.32	2873.37
2	SE Corner S. Marsh Lake	2896.83	2893.83	2894.60	2893.33
3	SE Corner Pony Lake	2899.97	2898.07	2899.47	2897.87
4	SE Cow Lake	2922.29	2919.29	2919.22	2918.61

5	Calf Camp & Hwy 83	2896.65	2894.85	2896.42	2895.23
6	Calf Camp West	2916.63	2913.43	2915.44	2913.77
7	Little Hay West	2918.44	2917.24	2916.07	2916.09
8	Little Hay & 83	2898.98	2897.88	2899.45	2898.38
10	W. Pony & 83	2925.41	2923.51	2922.86	2922.67
13	S. Willow Lake	2919.25	2918.35	2917.28	2917.26
14	E. McKeel Lake	2922.27	2919.87	2920.07	2919.16
15	S. East Sweetwater Lake	2927.17	2925.57	2925.12	2924.71
16	SE Trout Lake	2900.37	NA	2899.02	2898.83
17	E. Crowe Headquarters	95.8	95.9	95.27	95.11
18	NE old Harse place	NA	NA	2891.7	2890.61
20	S Watts Lake	2926.56	2924.66	2924.75	2924.23
21	E. Pony Pasture	2927.04	2925.04	2924.97	2924.56
22	Hackberry-Dewey Canal	2923.99	2923.99	2923.70	2923.33
23	Badger Bay	2925.59	2924.69	2923.69	2923.86
25	E. Pelican Lake	2943.12	2942.82	2943.78	2943.43
26	E. West Long Lake	2967.98	2965.48	2965.33	2965.34
27	W. Recreation area, Dad's Lake	2958.69	NA	2957.673	2956.61
29	NW Pelican Lake	2948.59	2948.59	2948.277	2947.42
30	S. Dewey Marsh	2941.34	2940.14	2940.577	2939.50
31	W. Dewey Marsh	98.4	99.2	98.34815	98.61
32	N. Pelican Lake	2943.25	2941.95	2941.567	2941.03
33	NW West Long	2981.7	2978.8	2980.57	2979.88
34	83 & W. King Flat	2926.79	2925.39	2924.04	2923.95
35	SE 21 Lake	98.7	95.7	96.17333	95.52
36	W. Sweetwater & 83	2926.97	2927.27	2927.167	2926.51

38	SE West Twin	2912.74	2919.84	2920.61	2920.08
39	WS Hassle place	96.7	NA	94.48696	94.10

## 5. Grasslands

The native prairie on Valentine NWR was recognized in 1979 with the designation of the refuge as a Registered National Landmark. Four range sites are recognized within the refuge boundaries, each contributing to the diversity of the grassland. Wetland range sites are characterized by prairie cordgrass, blue-joint reed grass, sedges, goldenrods, saw-toothed sunflowers, and willows. The threatened western prairie-fringed orchid also is also found in some of these wetland range sites.

Sub-irrigated range sites are located where the water table is near the soil surface. These areas support grasses more characteristic of the tallgrass prairie. Dominant species found in these areas include switchgrass, Indian grass, and big bluestem. Many of our problem plant species occur in these sub-irrigated range sites. Kentucky bluegrass, smooth brome, leafy spurge, and Canada thistle are all most prevalent here.

Sand range and low sand range sites are on lower and gently sloping hills, and are covered with native cool and warm season grasses characteristic of the mixed-grass prairie. Needle and thread, porcupine, June, western wheat, prairie sandreed, sand bluestem, sand lovegrass, little bluestem, and switch grass are prevalent on these sites. Many forbs are also found here at varying abundance and visibility depending on climatic conditions.

Choppy range sites are the high dunes that gave the Sandhills their name. These hills are generally vegetated, but may be subjected to wind erosion resulting in a blowout. These blowouts are habitat for blowout grass and the endangered blowout penstemon. Predominant grasses in the “choppies” are blue grama, sand bluestem, prairie sandreed, sand lovegrass, sandhills muhly, and little bluestem.

Grassland management goals are to preserve, restore, and enhance the ecological diversity of indigenous flora of the Sandhills prairie. Management to meet this goal is accomplished through disturbance with grazing, haying, and fire, and rest.

## 7. Grazing

In 1985 the refuge habitat management program was changed and short-duration grazing started. Prior to 1985, much of the refuge grasslands were grazed on 6 week rotation. Refuge permittees initially resisted the change to short-duration grazing. We have however seen a gradual acceptance of it over the past years. Acceptance has come through reduced grazing fees for the extra work involved in moving cattle and the obvious improvement in refuge grasslands. Several ranchers are now using short-duration grazing on their own ranches. Authorized AUMs for

each of the ten permittees have remained about the same or been slightly reduced from 1994 levels.

Grazing fees for 1995 were:

spring grazing treatment	\$9.41/AUM
short-duration grazing	
1 day in unit	\$2.08/aum
2 days in unit	\$7.58/AUM
3 days in unit	\$9.41/AUM
4 days in unit	\$10.14/Aum
5 days in unit	\$10.50/Aum
6 days in unit	\$10.87/AUM
7 days in unit	\$11.24/AUM
8 or more days in unit	\$12.70/AUM

feed hay and graze in unit	\$12.70/AUM
feed hay in feed lot	\$9.41/AUM
feed hay on road	\$9.41/AUM
winter	\$12.70/AUM
share hay (permittee feed on refuge)	no charge for up to 3 AUM/ton

The full rate of \$12.70 is an increase of \$1.00 from the 1994 fee and is based on a 1993 rate survey. During 1993 a grazing rate survey was conducted to adjust the grazing fees at Valentine NWR. A base rate of \$15.60 per AUM was recommended to the regional office based on eight interviews. Rates from interviews ranged from \$12.00 to \$21.00 per AUM. The new base grazing rate for the state of Nebraska was set at \$17.87 per AUM by the regional office. Our rate is allowed to go up only \$1.00 each year which it will do until the full rate is reached. Cattle prices have fallen at a greater rate than pasture rental rates in this area. This will cause our grazing rate to remain below the market rate as the FWS full rate is tied to fall cattle prices. A preferable way to set the rate would be by using the previous years Nebraska Farm Market Developments survey. Nebraska Cooperative Extension does this survey which includes regional pasture rental rates. Using this survey would keep our rates current and eliminate the work of performing our own grazing rate survey.

Permittees also had their grazing bills reduced for improvements and repairs to wells, fence, tanks and other facilities needed for the program. In 1995, \$26,196 was spent on improvements and deducted from final billings. This year as in 1994, permittees were required to hire a contractor to repair fences in the units they used. Basically two fence contractors were hired and they split the fence repair for the ten permittees. They were paid \$23 per hour for a crew of 2, and supplied their own gas, tools, vehicle, and equipment. This year part of the hay for the Texas longhorns at

Fort Niobrara NWR was also put up and hauled by a contractor and the cost of \$5,656 deducted from permittees grazing bills. Total collections for the 1995 grazing season were \$44,066. This total does not include the value of the refuge share of hay.

A big change in this years program was the retirement of Larry Vaughn who had been working with the permittees and the habitat management program at Valentine NWR for many years. Larry was still around and provided valuable advice and help but the bulk of the what was a full time job was assigned to an assistant refuge manager. This has basically reduced the quality of this program and other refuge programs. No replacement for Larry Vaughn's old position was granted.

The methods and expected results for the different grazing strategies are explained below. The acreage of grassland treated with each type of grazing is listed in table ??.

#### a. Spring Grazing Treatment

Spring grazing treatment (SGT) is done before the end of May on sub-irrigated meadow sites. The cattle are in the unit for greater than 2 weeks. Cattle eat or trample almost all of the residual cover. They also overgraze and thus reduce undesirable cool season exotic grasses (Kentucky bluegrass and brome). Cattle can be placed in a unit to remove residual and then brought back in later to hit the cool season exotics. In some instances, cattle are brought back in at several later dates for the same purpose. Because much of the feed is in the form of old mat, this treatment is best done by fall calving cows and not by lactating spring calving cows. Meadows that are hayed are also sometimes given this treatment to add fertilizer.

Dramatic results occur with this treatment. Exotic cool seasons, as Kentucky bluegrass, are suppressed and native warm seasons, as switch grass, increase in vigor and density. The disadvantage is the loss of the unit for nesting in the year of treatment and a lower waterfowl nesting density in the following year. Often the unit can however be rested for up to 5 years following treatment.

In 1995, 27 habitat units totaling 4,244 acres received a spring grazing treatment and included some areas that were latter hayed.

#### b. Spring Short-duration Grazing

Spring short-duration grazing (ES-SD) is grazing a unit for less than 2 weeks during May. Generally the cattle are in the unit for only 3 to 5 days. This type of grazing is generally done in hill units to stimulate growth of grasses, especially cool seasons. The short exposure times eliminate overgrazing. In 1995, 30 habitat units totaling 6,310 acres had spring short-duration

grazing. Where possible units grazed later in summer the previous year are grazed using this treatment. This both varies treatment and reduces disturbance to nesting cover. Most units grazed with ES-SD show excellent growth by fall.

c. Short-duration Summer Grazing

Short-duration summer grazing (SD-S) is done from June 1 through September 1. Cattle are in a unit for less than 2 weeks. Most units are grazed only 3 to 5 days and the cattle moved on to the next unit. Electric fences are used to break up larger units and increase stock density. Most short-duration summer grazing was completed by mid-July. In 1995, 77 habitat units totaling 18,251 acres were short-duration summer grazed. Units grazed in this method show good growth by fall if there is adequate moisture. If little or no late summer rainfall is received regrowth is less, especially in those units grazed in late July or August.

d. Summer Grazing

Summer grazing (S) is done from June 1 through September 1 and cattle are in the unit for 2 weeks or longer. In 1995, 2 units totaling 2,099 acres were summer grazed. These are larger units which have not been cross fenced.

e. Fall Grazing

Fall grazing (F) is done from September through November. Fall grazing can reduce mulch accumulations, add fertilization, and maintain grouse leks. If done at the proper time cattle will also graze out small wetlands and leave the surrounding upland vegetation alone. Generally the wetlands have green in them while the uplands have only cured grasses. Grazing in the wetlands recycles nutrients and provides pair habitat for ducks in the spring. Generally we have moved away from fall grazing except for pothole grazing. Fall grazing eliminates both winter cover and nesting cover in the following year. Some units were fall grazed in 1995 that will be given a spring grazing treatment in 1996. One unit was fall grazed after being hayed. This adds fertilizer to the soil and eventually quality and quantity to the hay harvested. In 1995, 4 habitat units totaling 948 acres were fall grazed.

f. Winter Grazing

Winter grazing (W) is done during the November through April period. In winter grazing, cattle are fed hay on a feed ground in a unit. The hay comes off the refuge. When the weather is harsh the cattle feed on hay but when it is nice they graze away from the hay ground. Winter feeding creates dense weed patches for several years following the treatment. These weed patches provide winter food for deer, pheasants, and other resident wildlife. Units with a history

of winter grazing combined with feeding also have excellent growth of grasses away from the feedlot. This is due to the import of energy in the form of fertilizer. Hay is cut in the meadows. Resident wildlife also utilize waste grain from the feeding operation. In the past, two feeding areas were maintained in Calf Camp and Little Hay Valleys. The permittee who had done this in the past declined to do it this year. The winter feeding was offered to the other permittees but declined by all. It is hard to get someone to feed cattle away from their ranch headquarters these days. Winter feeding can also be used to stabilize blowouts and roads. In 1995, 3 habitat units totaling 1,027 acres were winter grazed.

#### 1995 HABITAT MANAGEMENT BY UNIT SUMMARY

<u>treatment</u>	<u>units</u>	<u>acres</u>	<u>AUMs</u>
<u>rest</u>			
rest	172	26,576	-
rest (portion hayed)H-R	5	1,074	-
subtotal	177	27,650	-
<u>spring</u>			
spring grazing treatment SGT	19	4,244	1,345
SGT portion hayed SGT-H	8	948	440
early spring short duration			
ES-SD 1-6 days	26	4,853	731
ES-SD 6-9 days	4	1,457	201
subtotal	57	11,502	2,717
<u>summer</u>			
short duration summer			
SD-S 1-3 days	36	4,998	912
SD-S 4-7 days	39	12,011	1,922
SD-S 8-15 days	2	1,235	218
summer S 15-27 days	2	2,099	326
subtotal	79	20,350	3,378
<u>fall</u>			
fall F	3	681	314
fall, portion hayed F-H	1	267	168
subtotal	4	948	482

<u>winter</u>				
winter W and Feed lot FD-L	3	1,027		
719				
<u>hayed</u>				
portion or all hayed	21	725	-	
<u>misc.</u>				
govt. horse	1	20	12	

\*\*note that acres when totaled exceeds the approximately 61,661 acres of upland on the refuge due to double treatment of some units

#### 8. Haying

Seven hundred and fifty acres of sandy, sub-irrigated, and wetland range sites were mowed and yielded 1,364 tons of hay. All or part of 21 habitat units were mowed and hayed. Units hayed (H) are listed in the table. The hay was obtained and distributed as follows: refuge share under farming agreement (40 percent split) 480 tons delivered to Ft. Niobrara NWR and 29 tons fed by permittee in W treatment; permittee share (60 percent) 749 tons; permittee feedlot 223 tons (permittee receives 100 percent of hay and is charged for feeding on refuge on an aum basis); and contractor 177 tons delivered to Ft. Niobrara NWR, cost deducted off permittee grazing bill. No road hay was retained at Valentine NWR this year.

Most of the meadows hayed are also grazed either in the fall or spring. This adds fertilization to the meadows and improves the quality and quantity of hay produce.

Haying is used to provide browse areas for Canada geese, sandhill cranes, prairie grouse, and deer. Mowing can also open up small wetlands for waterfowl pair habitat. Most of the refuge share under farming agreements and all the hay put up by the contractor is used at Ft. Niobrara NWR for winter feed for longhorns.

Areas to be hayed that we have found the endangered prairie white-fringed orchid orchids in the past were searched on foot. Searches were done when the plant was in bloom. Plants found were marked with fiberglass stakes and the area not mowed.

#### 10. Pest Control

Information on exotic plants and control was sent to National Biological Survey in Jamestown, ND.

Refuge staff will be included on the Purple Loosestrife Awareness Committee being formed in Nebraska.

Purple loosestrife is common on the Niobrara in Fort Niobrara NWR and several plants have been found and pulled on Valentine NWR. The committee is primarily interested in biological control. Asst. Manager Lindvall attended several of the meetings of the Purple Loosestrife Awareness Committee throughout the year. The committee has members from FWS, Audubon, county and state weed control, and Nebraska Public Power and is trying to 1) educate, 2) introduce bio control and 3) survey in Nebraska.

Two offers of free insects for control of purple loosestrife were refused due to lack of approval for release on refuge lands in Region 6. This is an opportunity that unfortunately we had to pass up. Loosestrife is well established and expanding along the Niobrara River inside and outside of Ft. Niobrara NWR.

Two patches of leafy spurge near Pony Lake (HU 31A) and several patches of Canada thistle were mowed on Valentine NWR. This prevents seed formation and vigor but does not really control the plants.

Spurge root boring flea beetles, *Apthona nigriscutis*, were released in habitat units 2B3A (250 adults), 2B3D (250 adults), and 15 C2 (250 adults), and 15C4 (250 adults). Reduction of spurge near the release site in 2B3D was noted and one flea beetle was collected from a previous release. The release site is marked with a white fiberglass stake and spurge was much reduced within about a 30 foot radius of the marker.

Another spurge root boring flea beetle, *Apthona cyparissiae*, was released in habitat units 34C1 trees (250 bugs) and 35B Camp (500 bugs). Goats had been used as a control here in previous years and much reduced the spurge. The goat program has been discontinued due to staff cutbacks.

A release of 100 *Larinus planus*, the seed head weevil, for Canada thistle control was made in habitat unit 7B.

Kentucky bluegrass, brome grass, Russian olive and cedar trees also occur on the refuge and cover more acreage and are indeed a bigger problem than the state listed noxious weeds. Control of the grasses is discussed under the grazing section of the narrative and cedars under the fire section.

### 13. WPA Easement Monitoring

Information on the Tower WMA and easement is in the Tower WMA Narrative Report.

The Swanson wetland restoration was visited and with the help of beaver is actually forming a larger

wetland than planned. The beaver has added to our ditch plug and added about 3 acres to the wetland!

The Mead FmHA easement was surveyed by regional office surveyor Pat Carson during the year. The easement was also fenced using private lands money and a contractor. The fencing will stop trespass grazing on the easement.

Warning letters were sent to the two owners and lessee of the Mead easement in Keya Paha County for haying done in violation of the easement terms. The lessee mowed the meadow in violation of the easement and without the knowledge of the owners.

Access to the easement was not settled during the year. The landowners and their neighbor are feuding over two county roads into the area. One road was well used historically and is claimed as access by the Mead property landowner. Their neighbor is trying to get this road closed. Another old county road goes to the property but has not been used in years. It has large trees growing in it.

Regional office surveyor Pat Carson was out to survey the Johnson easement which we received fee title this year (see section C-2). The fence on the west side of the land was replaced under contract using private lands money. The adjacent landowner has agreed to maintain this new fence. Musk thistle were pulled and chopped by YCC. Most thistle is growing by the old building site. The area is a nice addition to the refuge system. Holt Creek flows through the middle and contains state listed threatened and endanger fish. The woodlands and riparian area are also attractive to songbirds. Deer and turkey are common.

FmHA sold the land containing the Wagner easement this year. The new landowner seems willing to work with us on managing the area. The easement contains 160 acres where haying and grazing are not allowed and 189 acres without haying and grazing restrictions. The area is primarily riparian with surrounding grasslands. A letter authorizing repair of a small dam on the easement was sent to the new landowner. The dam washed out this summer during a record rainfall and will be repaired with NRCS help.

## G. WILDLIFE

### 1. Wildlife Diversity

Wildlife diversity, with the exception of large ungulates and their predators, is relatively unchanged in the Nebraska Sandhills as compared to most areas of the United States. Native grasslands dominate the local flora, and indigenous wildlife are well represented. Threats to this largely intact grassland system are changes in the disturbances that led to the evolution of the grassland system and invading exotic species. While much is not known about historic disturbance, fires and large bison herds undoubtedly played a role in shaping this grassland system.

Maintenance and enhancement of the Sandhills prairie is necessary to ensure the ecological integrity of the flora and fauna found on Valentine NWR. Grassland management on the refuge incorporates grazing, mowing, rest and prescribed burning to accomplish refuge objectives. Nesting information collected at the refuge indicates that management for greater quantities of tall, vigorous native vegetation provides the best nesting cover for migratory waterfowl and resident prairie grouse. This type of cover is often lacking on private land, thus the refuge has sought to use grassland disturbance to maintain grassland vigor without compromising nesting cover.

Refuge wetland management is primarily accomplished to maintain wetland quality. Size limits on northern pike, capture of adults, and chemical renovation of lakes have all been used to reduce carp populations. Carp have detrimental effects on water quality, and subsequent plant and invertebrate production which play an important role in waterfowl production. Removal of carp has not been accomplished on refuge lakes, although renovations in the 1970's and 1980's removed carp for a few years. Current management using northern pike seems to be working to limit carp population growth.

2. Endangered and/or Threatened Species

d. Western Prairie Fringed Orchid

---

Table G 1. Prairie fringed orchid locations on and adjacent to Valentine NWR, and number of plants present from 1991-1995.

<u>Location</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
Pony Valley: HU 32B2	47	1	63	105	78
Sweetwater Valley: HU 29A1	40	1	12	23	40
	10 <sup>a</sup>	NC <sup>b</sup>	38	65	31
HU 24C4					
	NC <sup>b</sup>	NC <sup>b</sup>	11	NC	9
HU 25B					
	83	2 <sup>a</sup>	4	7	6
ROW					
Cow Lake Valley: HU 25B	1	1	1	NC <sup>b</sup>	NC <sup>b</sup>
Calf Camp Valley: HU 18B7	5	1	0	3	7
East Long Lake: HU 36A				7 <sup>a</sup>	flooded
Hackberry HQ ROW				flooded	flooded
Powell Ranch-Duck Lake	7	present	11	7	7
Reese Ranch-Watts Lake			13 <sup>a</sup>	8	6

Crowe Ranch-Watts Lake		3 <sup>a</sup>	NC <sup>b</sup>
Crowe ROW-Watts Lake		3 <sup>a</sup>	NC <sup>b</sup>
83 Roadside Park-Red Deer Lake	2 <sup>a</sup>	NC <sup>b</sup>	NC <sup>b</sup>

<sup>a</sup> First year plants were noted and counted at this location

<sup>b</sup> Plants were not counted in this year

### 3. Waterfowl

#### a. Ducks

Table G 2. Waterfowl pair counts on the Marsh Lakes from 1991-1995, with the average counts from 1968-2001 (excluding 1972-1977, when data were not available).

<u>Year</u>	<u>BWTE</u>	<u>MALL</u>	<u>Dabblers</u>	<u>Divers</u>	<u>American Coot</u>
1991	392	238	706	156	193
1992	486	318	1046	216	1092
1993	297	287	725	109	73
1994	306	223	774	18	74
1995	201	324	714	59	89
1968-2001	397	222	805	135	300

Table G 3. Hen success and brood productivity indices on the Marsh Lakes from 1990-1994, with the long term average from years 1979-2000.

Year	Blue-winged Teal		Mallard		Dabbling ducks		Diving ducks	
	Hen Success <sup>a</sup>	Prod index <sup>b</sup>	Hen Success	Prod index	Hen Success	Prod index	Hen Success	Prod index
1991	30.6	1897	30.9	936	60.9	3019	11.9	101
1992	6.8	525	12.9	540	19.1	1275	2.3	30
1993	23.6	1106	13.2	504	41.4	1958	11.9	78

1994	14.5	693	13.0	384	24.4	1235	50.0	52
1995	19.4	616	7.4	318	25.5	1180	16.9	60
Average 1979-2000	18.9	1248.9	20.8	528.5	38.2	2181.1	21.1	152.2

<sup>a</sup> Hen success is defined as the number of broods observed divided by the number of pairs observed.

<sup>b</sup> Productivity index is defined as the number of broods observed multiplied by a species observability value determined by Hammond (Waterfowl Brood Survey Manual, revised 1970).

## 8. Game Mammals

### a. Deer

There are two State deer management units on Valentine NWR - Highway 83 divides the refuge into the Calamus West and Sandhills units. Harvest regulations are set by the Nebraska Game and Parks Commission, and regulations for the Sandhills unit are set to provide a higher percentage of quality bucks. In 1995, 11 mule deer and 82 white-tailed deer were harvested on Valentine NWR.

## 10. Other Resident Wildlife

### a. Prairie Grouse

Greater prairie chickens and Sharp-tailed grouse occur in nearly equal numbers across Nebraska, with the prairie chicken being more abundant in the central and eastern grasslands. Sharp-tailed grouse are more abundant in the western part of the state, and throughout the Sandhills.

Hunters are asked to voluntarily place one wing from each prairie grouse they harvest into one of five collection boxes on Valentine NWR. This collection affords a way to assess hunting pressure, harvest, and productivity of prairie grouse. Similar collection boxes are placed at Crescent Lake NWR, and on S. R. McKelvie and Halsey National Forests. At Valentine NWR, hunters reported harvesting 458 sharp-tailed grouse and greater prairie chickens during 436 hunter-days. Of the total grouse harvest in 1995, 355 were sharp-tails, and 75 were prairie chickens. This harvest is somewhat above the average total harvest of 416 grouse (1979-2002 average). Juvenile to adult ratios indicate reasonable reproductive success for 1995, with 2.40 juveniles:adult for sharp-tails, and 1.27 juveniles:adult for prairie chickens.

## H. PUBLIC USE

### 1. General

For calendar year 1995 visitation to Valentine NWR is estimated at 9,290 visits with about 90% made up of fishermen. Seven daily counts were used to estimate fishing visits. This is fewer numbers of counts than used in the past so the estimate is not that good but better than a guess. The other 10% is mostly hunters. Increasing numbers of people are coming for bird watching and wildlife observation.

News releases were written and sent out to area television, radio, and newspaper outlets. Most were sent to about 41 outlets. Jr. Duck Stamp information was distributed statewide. It is not known how many use the releases. The local papers and radio carried them all. The following were sent out in 1995.

Larry Vaughn Retires

Junior Duck Stamp Contest

Longhorn Calving Time

Winner of Nebraska Junior Duck Stamp Contest Announced

Blinds Available for Viewing Grouse and Turkey

Bird Walk for Bird Day

New Alcohol Regulation on U.S. Fish and Wildlife Service Lands

Youth Conservation Corps Begin Work at Refuges

Nebraska Youth Habitat Stamp Art on Display

Nebraska Junior Duck Stamp Art on Display

Nontoxic Shot Required for Hunting on Upland Game on U.S. Fish and Wildlife Service Refuges and Waterfowl Production Areas

Learn to Shoot and Reload Steel Shot

Ft. Niobrara Longhorn and Buffalo Auctions

Kids Fishing Day

Ft. Niobrara Buffalo Auction

Junior Duck Stamp Art Contest

Asst. Manager Lindvall gave a luncheon talk on Ft. Niobrara and Valentine Refuges to the retired teachers association and others at the Valentine Senior Center on March 14.

Audio cassettes and large print brochures for all Ft. Niobrara and Valentine Refuge brochures except the bird lists have been prepared. An audio cassette of the visitor center displays has also been completed.

Valentine NWR was one of the areas featured in a story on places to visit in the prairie in Midwest Living Magazine.

Open containers of alcohol are now prohibited on both Fort Niobrara and Valentine NWRs. Nebraska

Game and Parks recently enacted a similar ban on their state parks and wildlife areas.

Chad Devore, regional office public use, visited both Ft. Niobrara and Valentine NWRs for a review of public use programs and facilities. In his report he lists priority concerns and issues as Hackberry Administrative area safety as it relates to visitors using a maintenance area and the need of a site development plan for Valentine NWR.

## 2. Environmental Education - Students

Due to staff cutbacks environmental education activities were reduced in both 1994 and 1995. In the past we had done Wildlife Week programs for over 800 students. No programs were done this year. Numerous requests by school teachers for tours were declined. At one time we were giving about 15 tours a year. One request to participate in a conservation fair was turned down due to lack of staff. We had always been able to do this program in the past.

We hosted the Federal Junior Duck Stamp Contest for 1995. The contest was judged in Valentine on April 6. Judges were Mark Adamson, Adamson Studios; Joe Gabig, Nebraska Game and Parks; Jon Kaufeld, US. Fish and Wildlife; Fred Thomas, Omaha World Herald; and Kurt VerCauteren, Nebraska Chapter of the Wildlife Society. Clark McCune from Hyannis was judged Best of Show. Clark won the Nebraska Contest in 1994 also and went on to win second in the national contest. Clark did a painting of wood ducks in flight. The Fort Niobrara Natural History Association and Nebraska Chapter of the Wildlife Society provided about \$300 each for funding for the contest. The money was used for prizes, mounting of winners art, and a luncheon for volunteers and judges.

The Junior Duck Stamp display with Nebraska's top 36 entries was displayed in Falls City, Hyannis, Scottsbluff Schools; at the Game and Parks office in Omaha; Cabella's in Sidney; at the Main Post Office in Lincoln, at the refuge visitor center, and at the Wildlife Society meeting in Crawford.

## 6. Interpretive Exhibits/Demonstrations

The interactive media program for the Fort Niobrara NWR visitor center was received from Nebraska Educational Television. The program has information on wildlife, management, history, ecology, and visitor opportunities at both Fort Niobrara and Valentine NWRs. Photos and movies are included in the program which runs on a multi-media program with a touch screen. Visitors can select those topics they are most interested in. The project was done for \$6,500 with Watchable Wildlife funding and support from the Fort Niobrara Natural History Association. Refuge staff provided script and slides and Nebraska Educational Television did production, assistance with equipment selection, and provided some video and photography. Nebraska Educational Television is maintaining a backup of the program. We are very pleased with the finished product, especially since commercially available

programs of the same caliber run \$60,000 per minute! Ours runs about 15 minutes if the visitor goes through all avenues.

## 8. Hunting

Waterfowl hunting is permitted on Watts, Rice, and Duck Lakes. Seasons and limits are the same as for the state. The 1995 seasons were Oct.7 - Dec.3 and Dec. 9 - Jan. 2. Realistically duck hunting is over here in the first part of November as lakes and marshes freeze. The past several years duck hunting has not opened until the end of October which limited opportunity to hunt before freeze up. The new season with the earlier opener has increased opportunity. No counts were made but it is estimated that about 50 visits were made by duck hunters.

Nebraska pheasant season opened on November 4 with about 100 hunters out on Valentine NWR. Pheasant numbers and hunter success were low on the refuge. The pheasant season ran from November 4 through January 31, 1996 with a bag limit of 3. No surveys other than the opening day count were made. An estimate of 250 visits by pheasant hunters is made.

The 1995 prairie grouse season ran from September 16 through December 31 with a three bird limit. This is one month longer than what the season has been in the past. Few hunters however were out in December, the month added to the season. Hunter harvest is reported through wing collection boxes placed at five locations on the refuge. In 1995 a total of 208 grouse was reported harvested. One hundred ninety seven hunters participated in the voluntary survey. Hunters reported taking 1.1 birds/day. Many out of state hunters travel to the refuge for grouse hunting. Complete information on grouse harvest is found in section G10.a. of this report.

Nebraska rifle deer season was from November 11-19. The refuge was closed for the last 3 days of the season due to shut down of the government. The area was posted and patrolled but some hunters checking deer at state run check stations did report taking deer on the refuge during the last days of the season. Most of the deer hunting takes place on opening weekend so the effect of the shutdown was not that great. A total of 93 deer was recorded and included 82 white-tails and 11 mule deer. Numbers come from deer checked by refuge officers and records obtained at Nebraska Game and Parks check stations. The Sandhills Unit, all the refuge west of Highway 83, remained in a trophy management unit. A casual observation is that it is working on the refuge. We have seen more bucks in the older age classes since the program was initiated. Nebraska Game and Parks removed Valentine NWR and McKelvie National Forest from the area where antler less only deer permits for the Sandhills Unit are valid this year. This was done at our request as we already have high hunting pressure and the permits are depredation permits.

The portion of the refuge east of Highway 83 is in the Calamus West Unit.

The refuge is open during the statewide muzzle loader deer season held in December. One

white-tailed buck was taken during the season.

The refuge is also open to archery deer hunting but no deer were known to be taken by bow this year. Coyotes can be hunted on the refuge from December 1 through March 15. Free permits were issued to hunt coyotes for the 1994-95 season. Interest in coyote hunting has declined with the decline in fur prices. For the 94-95 season 40 permits were issued, 26 returned, with a reported harvest of 11 coyotes.

Signs were put up, hunting leaflets changed, and statewide news releases sent out to announce the new steel shot requirement for all bird hunting on Valentine NWR. This was done following the nationwide requirement for steel shot use on refuges. The state also listed the new requirement in their hunting brochure. Compliance appeared good for the grouse opener on September 16.

Two thousand dollars was received from migratory birds to fund two steel shot education kits to be used by refuges in the region. The kits contain videos, target throwers, reloading equipment and other items needed to run a program which has information on shotgun handling, shooting steel, reloading steel, and a practical. The steel shot education program was completed in August and presented to those attending the fall LE refresher at Ft. Niobrara NWR.

Two steel shot shooting and reloading workshops were held, one at Fort Niobrara for Valentine area people and one at Valentine NWR for grouse hunters. Nine people attended the workshops. The availability of the kits was put out on cc mail. To date only Crescent Lake NWR has conducted a program. Several other inquiries were received.

#### 9. Fishing

Nine refuge lakes (Watts, Rice, Duck, West Long, Pelican, Hackberry, Dewey, Clear, and Willow) are open to fishing year round. Fishing, especially ice fishing, accounts for most visits to Valentine NWR. In 1995 an estimated 7,000 visits were made for fishing. This figure is based on 7 counts of fishermen made throughout the year. The average on weekday counts is multiplied by the number of weekdays and the average of weekend counts multiplied by the number of weekend days in a quarter to arrive at an estimate. Partial counts are adjusted upward if all lakes are not surveyed. No counts were made in the summer or spring. The estimate is probably not that reliable but better than pulling a number out of a hat. Ice fishing opportunity was limited by early ice out (February 24, 1995) and late ice up (first good ice was December 9, 1995) followed by the shut down of the government and refuge from December 15 through the end of 1995 and into 1996. Needless to say the ice fishermen were not pleased with the shut down of the refuge after only one week of ice fishing.

In the spring most access trails for fishing were closed due to high water and flooding of the trails. Only parts of 3 lakes could be reached during this period.. Quite a few complaints, including several to congressmen, were received. Water levels in the lakes had to go down and the trails repaired before

they were reopened.

Refuge size limits remained the same as last year with a 15 inch minimum on bass and northern pike with a 28 inch maximum size limit (fish greater than 28 inches must be released). The state also has a 15 inch minimum on bass for most public waters. Minnows are prohibited on refuge lakes to prevent introduction of exotic fish. Catch and release for bass and muskie remained in effect on Watts Lake. Saugeye were stocked in Watts and Duck Lakes and are reaching catchable size. The state 15 inch minimum for this fish for lakes in western Nebraska applies to refuge lakes.

Copies of the 1996 Nebraska Lake Guide were received and include master angler awards for 1995 from the Valentine NWR fishing lakes. Hackberry Lake was second in the state for pike and third for bass. Pelican Lake was first for bluegill with 57 master anglers.

A news release was sent out to area news outlets for use during National Fishing Week. The release used fall fishery surveys to give anglers an idea of what they might expect to find in the refuge lakes. It also invited anglers to visit the refuge on free fishing day, June 1. On this date a state license was not be required for fishing in Nebraska.

#### 10. Trapping

The refuge has a trapping plan and is open to trapping. Interest remained low this year due to continuing low fur prices. No recreational trapping took place on the refuge in 1995.

#### 11. Wildlife Observation

Blinds for observing the prairie grouse displays were set up in the spring. Use was down from previous years due to the wet, cool weather.

People come to the refuge to birdwatch and enjoy the prairie. No counts are made for this type of visit which seems to be on the increase.

#### 17. Law Enforcement

Asst. Managers Sellers and Lindvall, Maintenance Worker Kime, and Manager Huber attended the annual LE Refreshers held in Tuscon, AZ. All also attended the fall requalification held at Ft. Niobrara NWR.

Eleven violation notices were written during the year. No cases were pending from 1994. Violation notices and disposition are listed in the following table.

Table Citations issued by refuge officers in 1995.

<u>violation</u>	<u>date</u>	<u>fine</u>	<u>disposition</u>
driving on closed trail	1/20/95	\$50	paid
driving off trail	1/25/95	\$50	paid
fishing with more than legal number of lines	1/28/95	\$125	paid
fishing with more than legal number of lines	1/28/95	\$125	paid
trespass on fire tower	4/15/95	\$50	paid
driving on closed trail	5/4/95	\$50	paid
no drivers license	5/30/95	\$75	paid
driving on closed trail	6/1/95	\$50	paid
trespass in natural area	11/12/95	\$50	paid
deer hunting without license	11/12/95	\$125	paid
throwing lit cigarette	11/14/95	\$75	paid

The hunter cited for deer hunting without a license was using another hunters license. The State also cited the person who loaned the license and is investigating whether the hunter who borrowed the license also purchased a resident small game license when he is not actually a resident of Nebraska.

The leaflet dispensers on the information kiosks along highway 83 on Valentine NWR were destroyed by vandals.

One warning for after hours trespass at Valentine NWR was written.

Asst. Manager Lindvall represented the refuges at a memorial service held at the Valentine Cemetery for slain peace officers.

## J. OTHER ITEMS

### 3. Credits

Mark Lindvall wrote the introduction, highlights, land acquisition, habitat, and public use sections in 1995. Biologist Mel Nenneman wrote the wildlife section in 2003 using old files.

TOWER WILDLIFE MANAGEMENT AREA  
Brown County, Nebraska

INTRODUCTION

The Tower Wildlife Management Area is located 13 miles south of Ainsworth, Nebraska in Brown County. The 480 acre property had a conservation easement placed on it on July 15, 1988 under the Consolidated Farm and Rural Development Act and Section 1314 of the Food Security Act. On September 30, 1991 the property was transferred from the Farmers Home Administration to the US Fish and Wildlife Service in fee title. The land is an excellent area for wildlife. About half the area is wetland and most of the remainder sub-irrigated meadow. A small portion is sandhills. Waterfowl, shorebirds, raptors, prairie grouse, and songbirds are all abundant. Surrounding lands are all in pasture. In 1991 a water control structure was installed in a ditch dug by previous owners. This structure increased the amount of wetland on the property substantially by restoring the area to a more natural state. The land on the property and surrounding area is beginning to heal from past abuse. The sandy soils were plowed, pivots installed, and an attempt made to grow corn. In 1994 an additional 440 acres lying north and west of the fee title was placed under easement before being sold by FmHA. A grazing and haying plan was written for this area and included as part of the requirements for the new landowner. This area was later renamed to Yellowthroat WMA.

#### E. ADMINISTRATION

##### 1. Personnel

The Tower Wildlife Management Area is managed from the Fort Niobrara-Valentine NWR Complex located in Valentine, Nebraska.

##### 8. Other

The Fish and Wildlife Service paid \$383 in April of 1995 from the Refuge Revenue Sharing Fund for the FY 94 payment.

#### F. HABITAT MANAGEMENT

##### 1. Wetlands

Water levels were monitored using a gauge on the water control structure. The 1991 Fort Niobrara NWR narrative has a history of water levels and the water level gauge. In 1995 dates and water levels were 4 May 10.12; 21 June water over gauge, 3.5 inches above top of riser; 8 August water over gauge, at top of riser; 7 December ice level above top of riser. Water levels were the highest recorded since the gauge and water control structure were installed. Water went around the dike and passed through the overflow located to the north. Wetland conditions were excellent throughout the year. Many

areas that have had no water in the past filled this year.

## 5. Grasslands

The grasslands on the area and on the adjacent land are in poor condition. The area was formerly planted to corn followed by a cover crop of rye. Grasses are coming back in some areas but there is still quite a bit of volunteer rye present. Kentucky bluegrass is also common and increasing.

A Wildlife Extension Agreement was prepared and signed for seeding of 60 acres of former cropland to native grasses for the Tower FmHA conservation easement lands owned by Ted Baker. The area seeded was the north half of the old pivot crop land located in the north west quarter of T 28N, R 22W, Section 26. The rye cover crop was mowed to reduce competition and a warm season native mix drilled in December of 1995. Private lands paid for the seed and the landowner drilled the seed and mowed the rye.

The grazing plan for the Tower FmHA conservation easement was amended to divide the north unit into 2 areas and add water in the east part. The landowner had not fenced the area or constructed the dugout (not in a wetland) by the end of the year.

## 10. Pest Control

Canada thistle, once a problem in the area, is almost all gone now. Very few plants were seen in a June inspection.

The high water has flooded a good portion of the leafy spurge found around the water control structure and in the tree lot south of the water control structure. No damage to spurge from an earlier insect release was noted.

Musk thistle was hand chopped in August. Only part of the patch located on the north west part of the property was cut. Some musk thistles were under attack by insects. Specimens were collected and sent to APHIS. They were identified as beetles that had been released in other areas of Nebraska for thistle control. They had made their way to this area on their own.

The willows and cottonwoods around the wetland on the east end of the area continue to grow in size and number. Some control is needed to retain the prairie nature of this area.

## G. WILDLIFE

### 2. Endangered and/or Threatened Species

A mature bald eagle was observed on 7 December 1995. This is the first observation for the area.

### 3. Waterfowl

No surveys were conducted during the year.

## H. PUBLIC USE

A great deal of time was spent trying to acquire access for the public to the Tower Wildlife Management Area. Originally a verbal request had been submitted to FmHA to provide for public access across land they owned. They either forgot or did not wish to provide this and sold the land with no provision for public access to our fee title property. We did get access for U.S. Fish and Wildlife Service personnel.

We then negotiated an access agreement with Ted Baker who owns the land the public would need to cross. Basically Mr. Baker will allow access if we purchase and fence a lane from the highway to our property.

Realty surveyed in the access route, appraised the land, and everything appeared complete. Request for engineering services and acquisition request were prepared for fencing of the access route. A title search, however, discovered an existing county road that goes part way into the property and is close or on the same route proposed for purchase.. The location of the existing road will need to be determined before this project can continue. At years end the landowner had closed off access to the general public.

### 8. Hunting

Waterfowl, pheasant, grouse, and deer hunting take place on the property but no counts were made of hunters or harvest. Access was limited to those with written permission to cross adjacent private lands.

### 9. Fishing

Fishing takes place on the east end of the property and is a popular winter activity. No surveys were conducted during the year. Access was limited to those with written permission to cross adjacent private lands.

Nebraska Game and Parks fisheries biologists conducted fish surveys using nets and electro-shocking this year. Bass, bluegill, perch, and crappie were sampled.

J. OTHER ITEMS

4. Credits

Refuge Operations Specialist Lindvall wrote all sections in 1995.